

# MANPOWER — TECHNOLOGICAL CHANGES.

4/3/81 — 31/12/81

(179A)

# Filings and findings

A LOW-COST system has been developed through the successful marriage of micrographing and data processing technologies.

South Africa has introduced its world renowned Micrapoint Electronic Filing and Finding System.

The stand-alone retrieval system makes use of the latest micro-processing technology to file and find information on microfilm.

The system is used for filing and finding microfilmed transaction records such as creditors' invoices and associated vouchers, debtors' invoices and other notes, statements and happening documents. It has also been used for personnel records and police files.

The 'walk-less' electronic filing system indexes, documents, storing descriptors of the microfilmed items together with their film addresses, on magnetic diskettes. A search for one or more microfilmed items may be initiated by keying in one or more of its descriptors. The system then directs the 3M Page Search Reader/Printer to retrieve and project the desired document images.

Made up of a micro-processor with a typewriter keyboard, 10 key numeric pad and video display console, the Micrapoint unit uses two diskettes (floppy disks) to store the index information. A 3M Page Search Reader/Printer is used for film retrieval, and a 3M PSF Systems Interface ties the two units together.

A unique characteristic, is that Micrapoint uses fixed logic therefore no programming is required. Upon arrival at the user's office (which does not need to be air-conditioned) the equipment is plugged into a standard electrical wall socket and the operator can start work within minutes.

The system contains the display instructions for the operator. When the system is turned on, or at other times as desired, a 'menu' of functions is displayed the operator then selects the function desired such as 'searching', 'indexing', 'changing', etc. During each operating sequence, a video 'prompt line' guides the operator.

RIGHT The VisiCalc™ evolved from the observations that calculations of projections financial ratios, income taxes, your own personal budget are all done with a calculator a pencil and a sheet of paper — three nearly universal tools. The convenience and familiarity of a pocket calculator is now combined with the powerful memory and electronic screen capabilities of the person computer — a better pencil and paper. It is an all-purpose planning and modelling programme used in selling such diverse products as trucks and life insurance.

## The user is freed from many routine jobs...

WITH the 8840 system, Nixdorf has introduced word processing systems, utilising the experience gained with workstation-oriented computer systems.

Word processing/text editing systems free the user from many routine jobs, allowing more room for creativity and improving motivation and efficiency. The functions of these systems include text entry, text editing, the processing of forms and standard letters, paragraph and file and information processing.

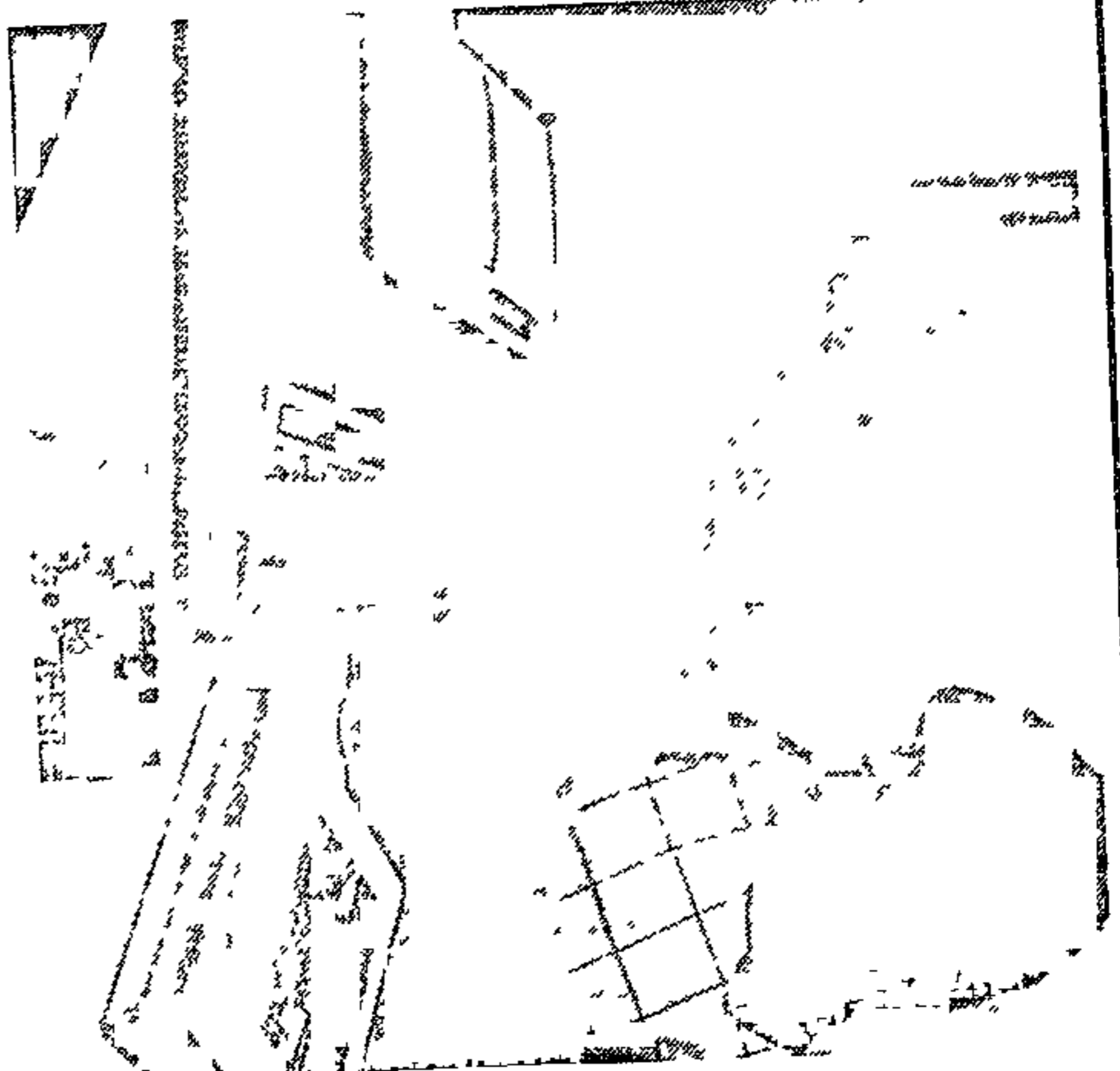
A new feature, introduced only this month and believed to be virtually unique to Nixdorf is the special telex paper-tape punch facility. Now an operator can prepare a complete telex message on the 8840 and then play it straight into a telex machine.

Another recent facility is the Maths pack. This allows complicated mathematical calculations as used in invoices, costings and financial reports etc to be automatically extended by the 8840.

Depending on the size of the company and the scope of individual jobs, the 8840 system can be configured either as a multi-terminal-system—the Nixdorf Multi-Text 8840/5 — or as a stand-alone system—the Nixdorf 8840/3.

The focal point of the system is the workstation comprising a display and keyboard. The display is portable and can be placed anywhere on the desk, its height and the viewing angle are adjustable. It displays 24 lines of 80 characters although larger formats can be brought into view by shifting the screen content up or across. Brightness and contrast are continuously adjustable to suit the needs of the individual. The non-glare, flicker-free screen has large amber-coloured letters which are easy to read and easy on the eyes.

In addition to a standard typewriter keyboard



there is a clearly separated block of function keys. The keyboard is connected to the display with a cable and can be moved around the desk at will. The keys are extremely light to the touch and virtually silent. The letter-quality printer writes at 2,400 characters per minute, ie 40 characters per second both forwards and backwards, producing up to 10 copies. The removable metal type wheel is available in a variety of type fonts with different character spacings. The text can be printed with one one-and-a-half or two-line spacing using the automatic form chute for cut forms or alternatively, the continuous form feed.

Each terminal can be fitted with a printer but with multi-terminal systems several workstations can share one printer.

The central processing unit controls access by the individual workstation to the magnetic disks — where over 2,000 pages of text can be stored — and manages the sharing of printers by the workstations.

Diskette or magnetic tape is used for text backup or external storage purposes. Documents which do not need to be permanently on hand can be filed in this way and stored across the systems. This means that the storage capacity is virtually unlimited. The systems in the 8840 product family are fully compatible enabling them to be connected to any Nixdorf data processing systems and communicate with them.

The use of ergonomics in computer design is part of Nixdorf's policy of making display workstations more human and has resulted in practical easy-to-use systems. Adaptability of the systems to the needs of the individual and their functional design means that an operator can adopt a comfortable typing position and read the display with ease.

## An 80-second facsimile with low total cost

FACSIMILE. A system of communication in which a transmitter scans a photograph map document or other fixed graphic material and converts the information into signal waves for transmission by wire or radio to a facsimile receiver at a remote point (McGraw Hill Dictionary of Scientific and Technical Terms).

This definition says almost everything about FAX-2200. In other words it gives you the following advantages. It leaves you with a record of what has been sent. It produces an exact copy of the original at the receiving point. There is no chance of hearing wrong and thus making a costly mistake, and it combine, the advantages of telephone, telex and mail service into one easy operation. FAX-2200 also performs several communications functions at once. (0 101 5374 through efficient)

Nevertheless, there have been problems with facsimile machines in the past. Operating cost for instance is added directly to your telephone bill. This coupled with high initial cost made slow-to-medium

speed machines very uneconomical. Furthermore before the FAX-2200, facsimile machines were often unreasonably complicated to operate.

But now these problems have been solved! FAX-2200 — speed and capability approach those of the best high-speed machine. Cost performance is such that you won't have to think twice about using it. Only CASIO could produce such a simple, low-cost facsimile as the FAX-2200.

It can send and receive through a telephone, and its sending speed is an economical 80 seconds per letter sized document. And the CASIO FAX-2200 can send photos, catalogues and other half-tone material fast and accurately.

Use this international G-II standard facsimile not only to strengthen your domestic communications, but also to broaden your international network. FAX-2200. It promises speed and efficient handling of your communications and office documentation. CASIO FAX-2200 and FAX-3300 — the newest development in time-saving, low-cost communications equipment.



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THE ELECTRONIC OFFICE '81

# Machines will not take over totally

## But the typist will have to adapt quickly

THE ELECTRONIC office is not some futuristic, machine-dominated and sterile environment looked after by a few human beings in metallic uniforms.

The equipment which is used in the electronic office is available today and is being rapidly introduced into offices throughout the country. People are as important, if not more important, to the electronic office as they were to yesterday's office and if anything machines are less in evidence.

What is happening is that the machines are becoming smaller, more reliable and can perform more functions better and faster. Noteworthy is the fact that in many cases this equipment costs less than that which it replaces.

The roles of the secretary and the typist are also changing and they will have to adapt quickly to meet the challenges offered. Obviously typing speed, accuracy and a good standard of spelling are as important as before. These skills have now to be extended to an ability to understand such concepts as list processing, text merging and document assembly, selection criteria and the repagination of text to suit a variety of print formats.

With the local market for word processing equipment currently growing at more than 150% each year an extensive training programme is being undertaken by suppliers. At this stage it is too early to

predict whether the demand for typists with word processing experience will be satisfied.

What is beyond doubt is that typists with word processing experience can command a premium wage and it is in every typist's interest that she makes a point of finding out what word processing is all about and learns to operate the equipment.

Any notion that word processing can be learnt in a five-day training course must, however, be dispelled. Like all other forms of training real expertise only comes from practical application and it takes some months before a typist can utilise all the features of word processors. Even then she will have to refer to the operating manual from time to time.

Practical problems are being encountered in training typists to operate word processors. The systems are logical and the operators are prompted through the operating

sequences. Nonetheless, some girls have difficulty in grasping the concepts. Maybe this is because the systems are designed by men (which, of course, means that they are extremely logical) and women have different logical thought processes. Perhaps the systems which will be operated by women should be designed by women as well.

More serious is the reflex resistance many of the more mature typists have to learning word processing. More than one typist has been reduced to a bundle of nerves on the second day of a word processing training course. This can be overcome by not trying to teach all the features of the equipment in one short duration course but to limit initial exposure to those most closely related to normal typing functions.

As these functions are mastered confidence will be gained to tackle the more sophisticated word processing techniques. Commercial schools must also ensure that all typing students

have the opportunity to learn about word processing.

The future for the typist in the smaller office where the expense of word processing equipment cannot be justified must also be considered.

It is not correct to say that the electric typewriter is dead, as is demonstrated by the current annual growth of 50% in the market for electric typewriters.

The electric typewriter will be found even in larger offices for a long time to come as they can fulfil functions which cannot be cost effectively carried out by word processors.

In any event electric typewriters can be interfaced with word processing machines through optical character recognition equipment. Text produced on standard electric typewriters can thus be read into word processors for subsequent editing.

The electronic office also includes other equipment to convert the spoken word to writing whether the writing be on paper, a magnetic medium such as tape, card or disk or microfilm, film it away, retrieving it and communicating it to whoever required. Word processors have the capability of communicating with each other through the telecommunications network and text can be sent to any destination in the world without committing it to paper.

Facsimile transmission equipment enables one to transmit in a matter of minutes a copy of a document or drawing with equal facility. Microfilm is now being used for wider applications than before. New methods of filing documents on microfilm and quick retrieval systems using computers have been developed and are being used as an alternative to the more common and bulky methods of document storage.

All of this equipment helps to speed up business communication and administration and at the same time makes the office worker's job more rewarding and interesting. And while much is being said about the ultimate in office equipment, the typewriter that can understand the human voice, it is not foreseen that machines will take over completely.

They can never be made to look as attractive as a secretary, make lousy tea, and are not as comfortable to have on one's lap.



She has been upgraded from the typists' pool to the control centre — the updated office of today

THE ELECTRONIC office, is the typist dead? Perhaps not, but the slow-moving, mainly manual office as we know it today will soon be as outmoded as the ox-wagon. Furthermore, the electronic office is not just a pipe dream, it is already a reality of commerce today.

Rapid advances in the field of office electronics are revolutionising secretarial and administrative work in large as well as small companies, with all-round benefits in terms of speed, efficiency, productivity, clarity and accuracy.

The days of the ordinary electric typewriter are numbered, although it will still have its place in many offices, just as the electric typewriter superseded the manual, so the electronic typewriter — with memory, interchangeable display printer wheels, pre-typing visual display, justifiable margins and many other features — is replacing the electric in many instances.

At least one major manufacturer, for instance, is about to cease the manufacture of electric typewriters in order to concentrate on its new electronic range. It is ironic that the typewriter is a comparative latecomer

to the field of electronics, since it is the most common piece of business equipment. Whatever form of word processing or transmission one is looking at, the basic principle is the conversion of the spoken into the written word.

The beginning was the word and the key to the word today — literally and figuratively — is the typewriter. Beside the electronic typewriter these are some of the services and aids that will be commonplace in the office of tomorrow.

Word processors. An extension of the typewriter, offering a memory bank and the execution of a wide variety of stored functions.

The Electronic Office. The transmission of letters and other documents by electronic data transmission systems, after they have been recorded on magnetic tape.

Teletex. Transmission of text by teleprinter lines, to be printed out on the receiver's printer.

Facsimile transmission ("Fax"). The transmission of images — typed or written text, diagrams, photographs — by telephone lines, as an adjunct to Teletex.

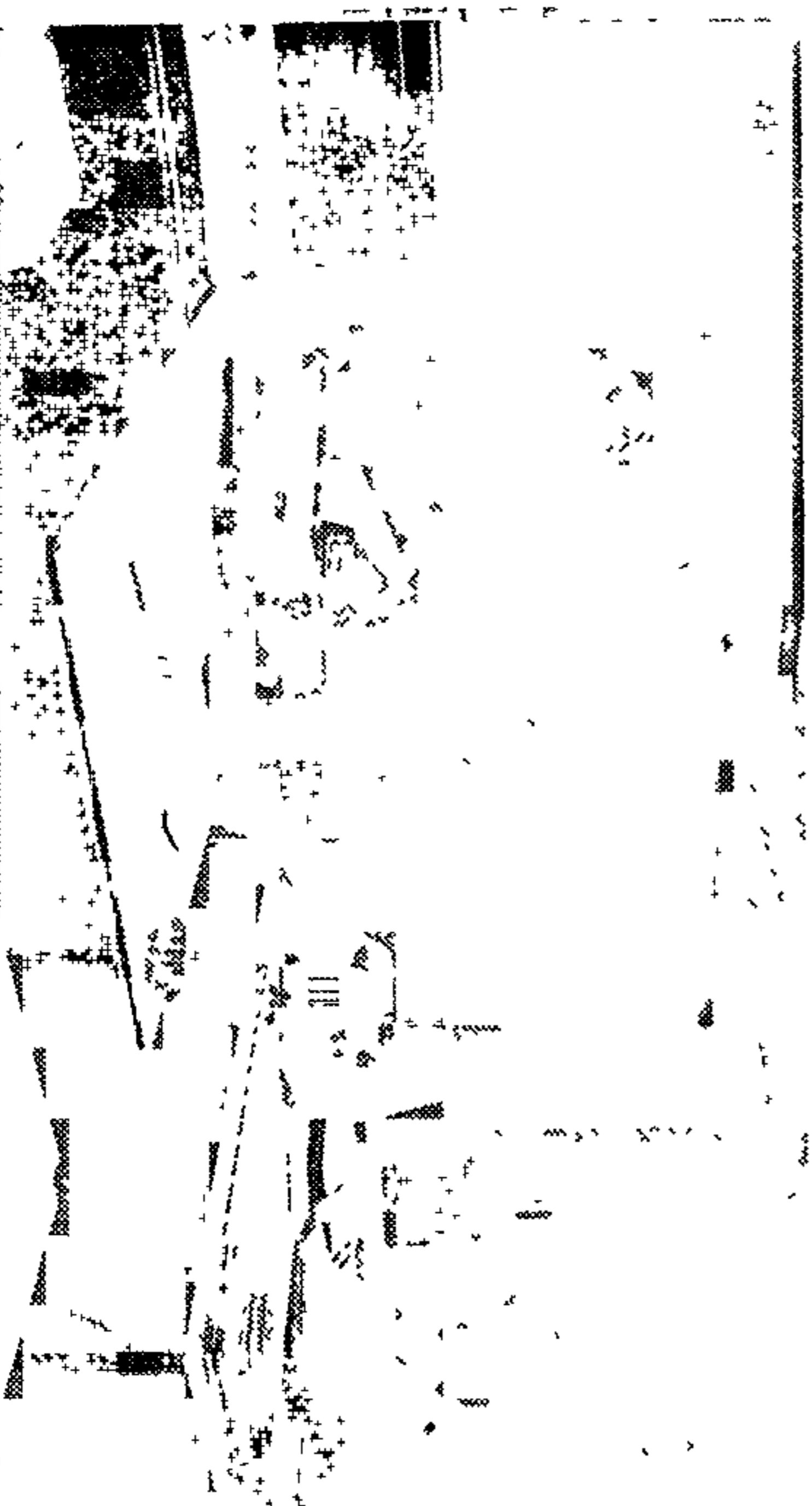
Videotex. Access to central data banks, the Stock Exchanges, airline booking terminals, etc. via a TV screen.

Communication copier: A photocopier which receives transmitted material and runs off the required number of copies.

Microfilm electronic filing. Space and time savers in sorting, filing and retrieving documents.

The manpower shortage, and rocketing salaries of secretaries, typists and other office staff, make it imperative for the modern manager to look at productivity, efficiency and cost-saving.

The typist may not be dead but she has been upgraded from the old-fashioned typists' pool to the command centre of commerce — the electronic office.



The electronic office people are just as important and if anything machines are less in evidence



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# THE ELECTRONIC OFFICE '81

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**WORD-PROCESSING** — an established fact of business life in the United States and Europe — is steadily gaining acceptance as essential for the South African office.

Although some estimates put the market penetration of word processing equipment in South Africa at only 10% of its potential, sales are climbing more and more rapidly.

Equipment units sold in 1980 were seven times the number sold in 1977 — from 277 units to more than 2 000.

The biggest of steady year-on-year increases was between 1979 and 1980 when sales trebled from 677 to 2 192.

According to Mr. Dick Finlayson, publishing director of The Office magazine serving businessmen throughout Southern Africa, businessmen are more ready to accept electronic innovations because of improved services from computer suppliers and distributors.

"The high priest has gone from between the layman and the computer."

"People realise that word processing is just a faster more efficient way of doing the same things they've always done — at their simplest revising letters and reproducing documents that are in regular use."

Some brands, like the Cado which now advertises on television, are complete with full instructions on how to use the equipment, he says.

Managing director of Wardal Information Systems, Mr. Tony Hampton-Tindale, says "The need for word-processing boils down to the need to process information faster and more efficiently."

Effectively, it can do away with the more automatic functions a secretary is forced to perform which can be done more effectively and faster by a programmed machine.

Capital outlay on such a machine seems costly but its cost-efficiency soon becomes clear when you look to the increase in productivity it brings about.

"A secretary costs almost double her wages when you consider her perks and her floor-space. Why employ more people than you need?"

"The factory has long preferred technology to labour — now the office is having its turn."

To coincide with this movement, the Electronic Office '81 Exhibition, now on at Milner Park showgrounds, Johannesburg, provides an easy gateway for new users to compare the equipment on the market.

Word processors are the next step in technology after the clever memory typewriters — which can cost up to R2 000 and are showing no sign of declining in popularity.

Some electronic typewriters provide display-setting and text-editing facilities.

They have helped to bridge the gap between the secretary and the automated office.

And with the help of other devices such as the OCR for "optical character recognition" they can reduce the number of word-processors needed in an office.

The OCR easily transmits or "inputs" original type-written copy into a word-processor.

Its marketing line is that to create original text on a word-processor is "bad use of labour and equipment" because "standard electric and self-correcting typewriters generally produce original work about 20% faster than a video-display word-processor."

## It's a faster, more efficient way of doing the same thing

The second type has the VDT and is a stand-alone unit along with its keyboard and its printer. It has its own in-built memory. Different models have different sized screens and storage capacities.

The "shared logic" system is further advanced and combines a number of display units which are linked to a central processing unit or CPU. These allow usage by a number of different people at any one time — the number varies with the model and its capacity.

With this system, inter-user communication is possible. Information can be sent from one terminal to another.

Sales figures show the screen-based stand-alone unit to be the most popular category. Its sales rose from 130 units in the quarter to March last year to 199 units in the quarter to September.

Computer sales organisations believe the upward trend is set to take off even faster and one of the first complete "office automation systems" was launched in South Africa in April.

Anglo American was one of the first SA customers to pioneer Prime Computers' multi-functional system which includes facilities such as electronic mailing, calendar-monitoring and appointment scheduling, and visual "tickler" reminder notes for a user's personal diary.

In the future, prices of word-processors — like desk-top calculators as they are typed from the keyboard of the word-processor

tors and other electronic equipment — will probably come down. The market is fiercely competitive and the technology behind their production increasingly cost-efficient.

The Office Magazine notes that hobby-type mini-computers are being imported at prices of under R1 000 a unit. At that price, they comment, retailers might try to cash in on a computer fad similar to the Citizen Band Radio craze of a few years ago.

With this increased availability, it will become progressively harder for any business to say no to word-processing — and soon to full office automation.

Internationally, the business world is speeding up communication with an increasing use of Facsimile machines for instant mailing.

"Anything on paper you can pop in your post-box, you can now pop into your telephone — as long as there is another facsimile machine at your destination to receive it," says Mr. Tony Hampton-Tindale, managing director of Wardal Information Systems.

And by the looks of it, it won't be long before they're sufficiently widely used to make them viable for general use.

In the United States, facsimile telecopiers are fast gaining on their slower but well-established opposition, the telex machine.

Telexes in the US number approximately 475 000. In only 10 years of growing popularity, facsimile machines number 250 000.

Because you slip your hard-copy — either written material photographs or graphics — directly into the machine, you by-pass the transcribing into any other form as is required by telex or telegram.

And you have a legally acceptable written document almost as directly as you have a telephone conversation.

The latest telecopiers, for example Rank Xerox's 840 launched in SA last week, don't even need to be attended by an operator. As long as they are switched on, the telephone is automatically answered and its message transcribed onto paper.

The telephone acts as a medium for an electrical impulse which the machine converts into a written copy onto thermal-reactive paper.

Because the image is chemically imprinted, almost "burnt" onto the paper, there is no fading or smudging either.



# Great prospects for these products

RAYTHEON International Data Systems, IBM's major competitor in the 3270 field, has entered the South African market with an extensive range of products.

Distributorship of this terminal equipment has been awarded by the grant American company to Datalog, South Africa's largest manufacturer of local data equipment.

The P/Ts 2000\* is the latest IBM compatible Raytheon terminal range.

These intelligent sub-systems are fully compatible with the 3271, 3276, and 3274 controllers with the associated screens and printers.

The Raytheon is unique in offering the small SNA — Systems Network Architecture — terminal cluster (3276 equivalent) which is field-upgradeable to the large terminal cluster (3274 equivalent). This permits a cost effective growth path for the user which is not available from IBM or any other IBM plug compatible supplier.

The PTS 1200 is a powerful modular mini-computer which is used for the RAYNET (Raytheon's Computer Network), as well as being the base vehicle for the many Raytheon DDP products.

John Schofield, director distributor, marketing, for Raytheon, has already completed his first tour of South Africa and is excited about the prospects he sees for his company's

products.

Datalog is being given full support from Raytheon in supply, training and back-up if required.

Personnel from Datalog will receive in-house training at Raytheon's Massachusetts' headquarters.

Datalog will build up stocks of the products to provide an off-the-shelf delivery service. However, should demand exceed local supply, a delivery turnaround is ensured of between 45 and 60 days following receipt of order.

Like many international airlines, South African Airways has been using Raytheon products for several years since it went into mechanised reservations systems.

Raytheon is among the 100 largest industrial corporations and is one of the top 50 companies in America.

It is a diversified, international technology-based company, providing products and services in electronics, aviation, energy, appliances, construction and publishing.

Its headquarters are in Lexington, Massachusetts, and the company has 11 divisions and 12 operating subsidiaries, with more than 65 plants and laboratories in 26 states in America.

It also operates in 33 countries round the world.

Established more than 50 years ago, Raytheon made its name in the field of radio tubes. During the Second World War Raytheon was a leading

producer of radar tubes and systems and later pioneered missile guidance.

In electronics Raytheon's main business is the design, engineering, manufacture and servicing of advanced electronic devices, equipment and systems for both commercial and government customers.

Last year Raytheon was the ninth largest prime contractor to the American Department of Defence.

It is a major supplier of tactical air-defence systems and a prime contractor for several top missile systems.

In commercial electronics, the company's communications and data systems product lines and services, include programmable digital data display terminals, word processing, scientific and general purpose minicomputers, digital multiplexing and data translation equipment.

Raytheon's diversified involvement in electronics means it produces products, for example, from equipment for hospitals, to micro-wave ovens, which, incidentally, it pioneered in America.

Datalog are naturally both pleased and proud to have been selected for distributing Raytheon's extensive range of products.

Until nine months ago Raytheon's involvement round the world in the computer industry was held solely by wholly-owned subsidiaries. South

Africa is one of the first countries to be chosen for a distributorship.

"We have quite a conservative approach to marketing," says Schofield. "We only allow our products to be sold in countries where we see a potential in real terms and stable economic growth. South Africa is certainly the most exciting prospect we have seen in some time."

As these terminals, which are already being investigated by several top South African companies, offer additional functionality at a lower cost than their IBM counterparts, they look set to grab a lion's share of the market in this country.

## Good back-up and training

MERCEDES Information Systems believe the versatility of their Lanier No Problem word processors and their strong support and back-up are the main reasons why their product is challenging the top sellers in the field in South Africa.

Lanier, an American-based manufacturer, has only been in South Africa for two-and-a-half years and in that time has captured a significant share of the rapidly expanding market in word processors.

Mick McCormick, national sales manager of Mercedes Information Systems, said "One of our main strengths is in the quality of our back-up and training."

"The Lanier No Problem is a versatile installation and simple to operate, but we believe training of operators and executives should be an ongoing business."

Mercedes Information Systems provide initial training for operators, follow up training, and quarterly up-date seminars to explain software up-dates, new software releases, and new applications to users.

"We average a two-hour response time for technical breakdowns, but we guarantee a four-hour turnaround," said McCormick.

Lanier, the largest supplier in the world of screen-based standard word processors, was also the first company to bring out a financial package on screen based word processing equipment.

The No Problem has the capability to expand into a "Shared System," which has numerous benefits — low cost per station, as 16 work stations can be hooked into one system, less media handling, enormous storage capacity, and the ability to add on peripherals such as line printers, etc.

The heart of the No Problem Shared System is the central memory unit storing up to 70 000 pages.

The system offers advanced features such as automatic repositioning, list merging, global search and replace, statistical typing, and the ability to produce line drawings and charts on the screen. Users can type, edit and print multiple column formats and automatically number pages.

The screen displays 254 characters. The Lanier No Problem is compatible with many computers. Its printing is of typeset quality.

# Updating the business community

ELECTRONIC Office 81, South Africa's first word processing, microfilm and facsimile transmission exhibition, will be held at Milner Park, Johannesburg, from today until Tuesday.

It is being organised on a non-profit basis by the Business Equipment Association of South Africa (BEA), which holds BEXA, South Africa's major business exhibition, every four years.

Mr Les Wood, executive director of BEA, said "In some sectors of the industry the rate of technological advance is so rapid that whole generations of machines come and go in that four-year period. Significant advances had been made in word processing, microfilm and facsimile transmission since the last BEXA exhibition in 1979 and BEA members decided it was necessary to update the business community."

"BEA represents more than 90% of suppliers of business equipment and visitors to the exhibition can therefore be assured of seeing in one place the total range of latest electronic office equipment available."

Mr Wood said that the show should be visited by everyone involved in business adminis-

tration as well as by professional people such as lawyers and accountants who are rapidly realising the huge advantages of word processing to them.

"The advent of electronic typewriters and word processors is revolutionising the office. The skills of the secretary-typist are changing accordingly and it is vitally important that she be exposed to this type of equipment and trained to operate it."

Exhibitors, who number more than 50, will distribute 100 000 complimentary tickets to clients and prospective clients all over the country. Anyone who does not receive a ticket in this way should telephone BEA in Johannesburg at 37-1419.

Between 12 000 and 18 000 visitors are expected during the five days of the exhibition, which will cover 2 500 square metres. The show will be supported by seminars at Milner Park on word processing and microfilm.

BEA called in Specialised Exhibitions, part of The Communications Group, to help them organise Electronic Office 81.



# Revolutionising the Eighties

At last the technological developments which have been revolutionising virtually every sphere of business activity are making an impression on office equipment.

Although the need for electronic data processing has long been accepted by SA companies, and has reached a high level of sophistication, electronic text processing is still in the early stages.

In many companies word processing still conjures up the image of an electronic typewriter — an upgraded, and obviously more expensive, version of the one the secretary already uses.

But word processors, or electronic text processors as they are increasingly known, are more than just fast typewriters with memory capacity.

Constructed with software that can be upgraded as technology develops, the word processor becomes an increasingly intelligent piece of equipment. When taken to its full extent, it can be linked to a central computer, do arithmetic calculations, conduct electronic mail transfers, file electronically, as well as carry out all the traditional functions of a typewriter.

And even the traditional functions are easier. No longer does the secretary have to type troublesome budget schedules. She simply calls up the format, types in the new figures, and *voilà* — the machine does the tabulating and so on. No longer does she work with messy carbon, or waste precious time retyping a letter because of a single error.

One big advantage of the word processor is its versatility and the ease with which individualised, document-quality printouts can be obtained. The library application is an example of how much time can be saved.

The librarian or clerk simply keys in the day's date and an instruction. The word processor then searches through its memory to find the names of all book borrowers who are overdue and what they owe in fines. It then prints out individual top quality letters to all concerned.

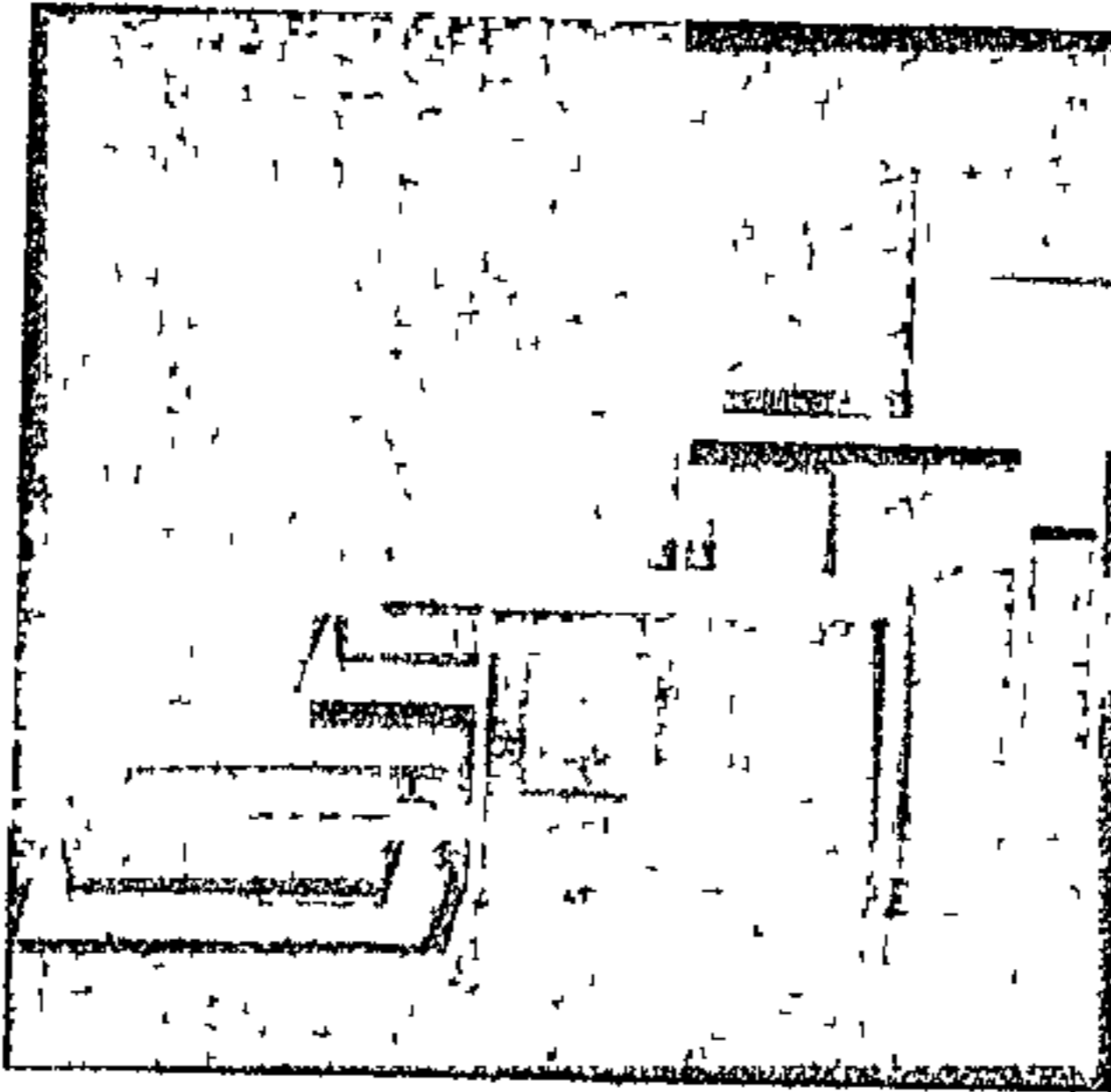
Similarly, an executive secretary can print out any number of documents, such as those required for board meetings, without resorting to the photocopier.

Fanie Marais, O & M manager of Sanlam and a recognised authority on word processing, believes the benefits are multi-faceted and range from increased office productivity to providing more meaningful job opportunities for secretarial and administrative staff.

Says Marais "Word processing is not the answer to all office problems, but an awareness of its potential to improve

productivity and be cost effective is essential for administrative office management. Top management commitment is essential for its success."

Marais is currently writing a doctoral thesis on information management, emphasising the role of word processing, and has based much of his research on the implementation of integrated information



Word processors . . . cutting costs, pushing productivity

text and data processing facility at his company, as well as a link-up with a photo-typesetting unit.

Traditional methods of word processing offered little scope for job satisfaction, personal growth and career opportunities, he says. Electronic word processing, like computerisation, assists in performing routine typing with little effort and operator involvement.

This frees the worker to perform more meaningful work. Many organisations using word processing systems report high levels of job satisfaction and expanded career opportunities after the introduction of word processing, he says. It also means a more effective use of executive time.

Richard Benton, international vice-president of Lanier, one of an aggressive breed of American companies which has entered the word processor market in the last few years, says the concept can be taken one step further if the word processing system is linked to the use of dictating equipment. Shorthand notes, he points out, take up two people's time.

Office environments have traditionally been highly labour intensive. And labour costs have often been the biggest single administration cost factor. This meant salary increases had a marked increase in unit costs, particularly because of the shortage of highly skilled secretarial staff.

With word processing, says Marais, the

percentage of labour costs is reduced and there is the added benefit of productivity figures increasing between 50%-400%. The electronic word processing systems are also cost effective, he says, with unit costs often decreasing to 75% within a short period of time.

At Escom, which has been one of the SA pioneers in the extensive use of electronic office equipment, an extremely successful application has been in the use of word processors and microfiche to streamline medical aid administration.

Now 13 people process the claims for the entire staff. The only paper work is in processing the original claims onto a word processor linked to a computer. All checking to avoid duplication of payments is done by computer. The original claims are put onto microfilm and filed. Previously, 20 people were needed and storage requirements were enormous.

Martin Hammerschmidt, MD of GBS, local representatives for Wang, says word processing sales could represent 50% of turnover by 1991 — a reflection of the situation world-wide.

The line of thinking is apparently shared by giant American oil company, Exxon, which has bought 15 companies, grouped together as Exxon Information Systems (EIS). Exxon is aiming for a lion's share of the market within five years.

What computers were to the Sixties, Hammerschmidt says, word processing will be to the Eighties. Of the projected \$5 billion turnover by Wang world-wide in 1990, \$2 billion is expected to be from the sale of word processors, \$2 billion from the sale of integrated text and data processing systems, and \$1 billion from computer sales.

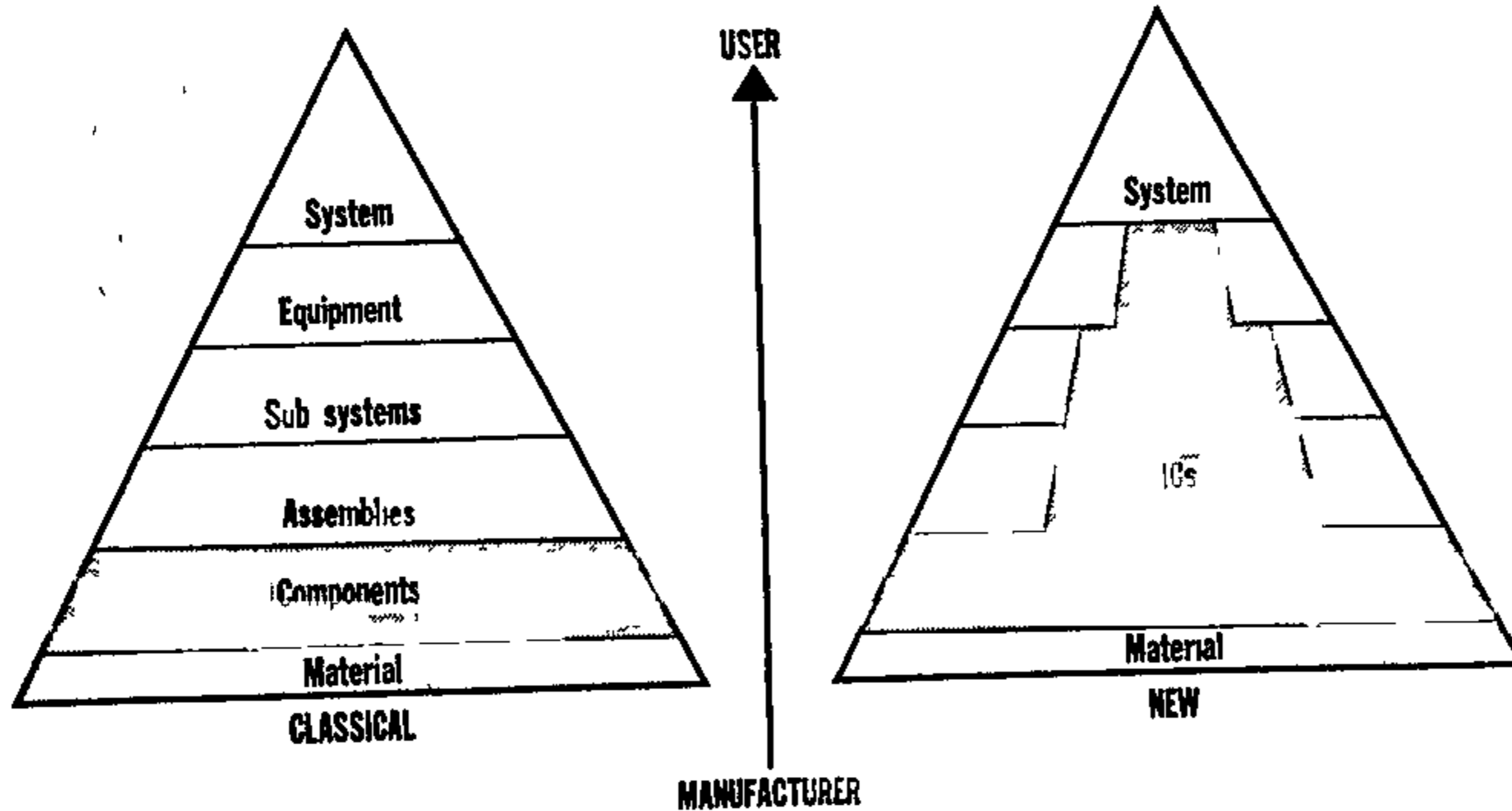
The average factory worker uses hundreds of thousands of rands of machinery daily to increase productivity, he says, but administrative staff are little more productive than they were 50 years ago.

Ian Currie, word processing manager for Burroughs, says the advantages of cheap memory space on magnetic storage disks, generally lower administrative costs and electronic mail transfer facilities, which are made possible by word processors, have been among the major attractions for businessmen.

An indication of the increasing level of interest locally is the number of suppliers, which has grown from four in 1976 (IBM, Wang Olivetti, Burroughs) to about 25 at the present time. Numerous micro and mini computer manufacturers also offer a word processing package.



## INFLUENCE OF ICs ON VALUE DISTRIBUTION IN ELECTRONIC BASED SYSTEMS



The dramatic effect that South Africa's chip manufacturer expects its products to have on the manufacturing process. The triangle on the left shows the process before the introduction of chips (or integrated circuits — ICs) at the component stage. On the right, ICs cut a swathe through the processes because they are more efficient than the existing systems. The implications for job opportunities in the right-hand triangle are far-reaching; a labour-intensive sector, like assemblies, is transformed into a capital-intensive sector.

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# Chips — open sesame to an industrial revolution

"CHIPS with everything", the trendy dish now topping the industrial menus of the world's technologically advanced countries, will be our own favourite delicacy — or even staple diet — before the decade is half over.

This is the prediction from South Africa's first domestic manufacturer of semiconductors, the components which are revolutionising microelectronics and are known generically as chips

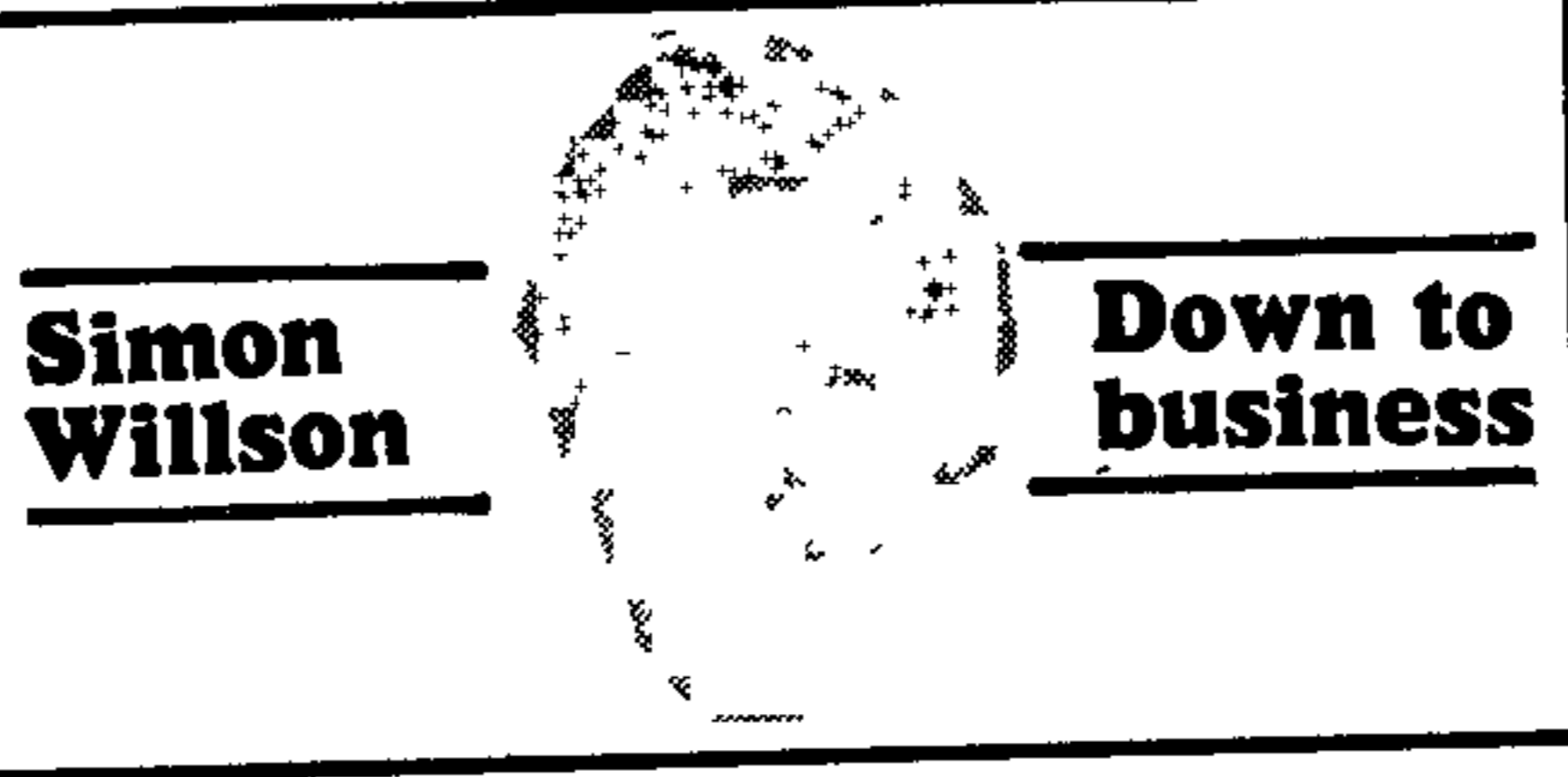
A chip is an electric circuit printed on polished silicon which, at the size of a thumb-nail, can carry enough commands to run the functions of an assembly line

The industry expects chips to lead to unprecedented increases in productivity, irrespective of labour supply or skilled labour input

Mr Geoff Hamebach is general manager of South Africa's first chip manufacturer, South African Microelectronic Systems (Sames). He believes the use of superlatives to describe the prospects for chip-assisted industry is genuinely justified

"We can go on the experiences of countries already using microprocessors on a large scale. Productivity increases by two orders of magnitude every five years — the sharpest quantum productivity improvement in the history of civilisation

"Now that the process has



started here, nothing can stop it"

A high billing to live up to for an industry so recently established here

Sames started assembling chips in June last year and will start marketing by the middle of this year

It is a joint venture between the Industrial Development Corporation, which has 51% of the share capital, and Siemens with 49%

The IDC became involved because the idea of producing chips in SA originated at the Post Office

When the Post Office's second 10-year contract for the supply of electro-mechanical switching ran out in 1975 it moved to the more advanced digital electronic switching. But there was little SA manufacture of the switches, and the local content of the Post Office's installations fell from 80% under electro-mechanical switching to about 30%

The IDC investigated the question of setting up semiconductor manufacture and settled on using a foreign-owned company with a sizable existing stake in South Africa — Siemens AG of West Germany

A technical co-operation agreement has been signed with Siemens AG, which is now the source of Sames' know-how and much of its equipment

The West German link, as with so much international co-operation with South Africa, is a source of possible embarrassment to the West Germans and is confined to an extremely low profile in the Federal Republic

Every equipment sale to Sames by Siemens AG has to be approved by the Bonn Government, and the appreciable Left-wing element in Bonn's ruling coalition means tact is important

But there are notable benefits to Siemens AG from being a parent company to an effective foreign subsidiary like

Sames, and these ensure the arrangement is far from a mere philanthropic gesture by the Germans

Sames will be second-sourcing components for Siemens, providing reliable alternative sources of supply at a time when the ending of the German economic miracle is reducing the country's domestic manufacturing efficiency

The effect of chips on the South African economy could easily live up to the high expectations held in the industry

Along with the introduction of robots on South African assembly lines (Down to Business January 26) the advent of chips has large implications for job opportunities

Like the robots, the most spectacular improvements from microchips come from installing them in repetitive processes usually performed by unskilled manual labour

Chips, like robots, will turn low-productivity, labour-intensive industries into high-productivity, capital-intensive industries without changing the nature of their output

With a large pool of unskilled manual labour in this country, this is not the best labour development conceivable

However, once the chip industry gets going, it is expected to lead to further opportunities in chip manufacture itself, and in spin-off industries



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# The Info system that's a winner

"Info gives you the facts of life" And what exactly is it? Not perhaps a political scandal? No, it's a new phone-in information service.

Costing R3,5-million, it is the most advanced and efficient information system in South Africa and it was launched in Johannesburg last week.

Info provides people with a free computer-based bank of information which is both comprehensive and up-to-date

Some of the information that it provides includes a business directory, classified advertisements, cinema, theatre and airlines and entertainment guides.

It is expected to achieve R7-million turnover in its first year

Where, in your neighbourhood can you buy new and second-hand consumer items such as ashtrays, cars, clothes or zeb-ras?

Where is your nearest supplier of business or industrial equipment? Where is your nearest architect or dry cleaner, plumber or electrician?

Which movie is showing in your local cinema?

When is the next plane to Durban and what is the weather down at the coast?

## PHONE CALL

All these questions and more can be answered by a mere phone call to Info

The Info permanent directory is completely national and is maintained and updated from one central point.

Classified information is localised within each geographical region and the Info centres in these areas maintain their own set of current files on items such as cars and houses for sale, weather, entertainment and local sports results

The system will gradually be extended to provide direct access to information in hotels and shopping malls and will enable Info users to make hotel bookings and advise housewives on the best buys of the day, recipes and even give the latest news

## Financial planning on a computer

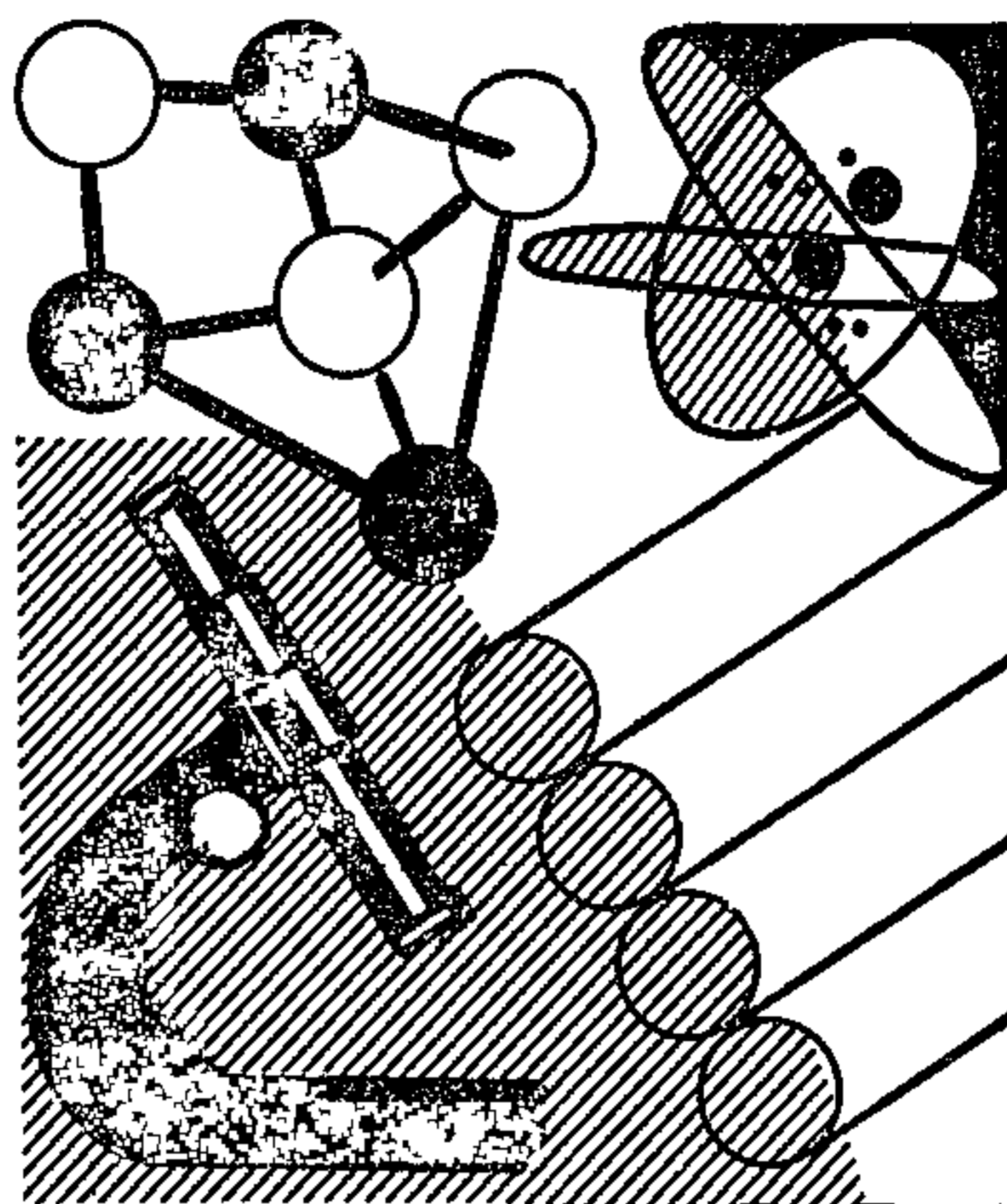
An easy-to-use cash forecasting and budgeting model for small to medium sized companies has been developed and is being marketed by Financial Information Reporting Systems (FIRS), a locally-owned and managed computer software house and computer consultants

Non-accountants can now produce reports of their company's projected bank overdraft, cash balances, break even position, balance sheets, income statements, receipts and payments within an hour of being shown the system says Brian Massey, the MD of FIRS who is also a qualified accountant

In boom times and easy money, many companies mushroom but go bankrupt when the economy experiences a downturn or money becomes tight

In order to help these companies, Firs developed this inexpensive package which at present is available on the Durango F85 microcomputer, the Prime mini computer and the SPS computer bureau

"Our main business is developing customised financial reporting and planning systems for top 1000 companies" says Mr Massey But, now that more companies are buying computers the expertise available through this package can now go to many other companies who cannot afford to design systems of their own"



# TECHNOLOGY

Written by ANN CROTTY

## Keeping an eye on that melting pot . . .

Many scientists fear that our global climate could be drastically upset by the increasing concentration of carbon dioxide in the atmosphere

A worldwide measurement network, built during the past three years, should help to monitor CO 2 content and follow future developments

The public has become aware of the immoderate use of fossil fuels — burning away in a few

years what nature amassed in millions of years

Besides the exploitation of these resources, the problem also affects our atmosphere — combustion products, especially CO 2, are being placed there in volumes far larger than nature can recycle

One result of this is the greenhouse effect the CO 2 blanket around the globe allows sunshine to enter but hinders the emission of heat from our planet back into space

According to experts, this condition will eventually lead to drastic results, even the melting of the polar ice caps.

Thus, scientists want to know exactly how this process is proceeding The international CO 2 measurement network will aid this study.

## Gencor goes Unicom

The Gencor Group has signed a contract for the installation of a Unicom Computer System

The acquisition of the new system heralds the start of a substantial computerised programme within the mining division of Gencor

This system, centred in the Witbank area, is the first in a new series

## Computers get goods rolling

Production of higher quality goods at lower prices is the industrial challenge of the 1980s and computers can be available in meeting that challenge.

This is the view of Hewlett Packard which held half-day seminars on the role of the computers in industry in Johannesburg, Durban and Cape Town

Using computers effectively on the factory floor can actually reduce costs while improving the standards of quality of the goods produced.

Advanced technology has reduced the size and cost of computers to such a degree that they can be strategically sited throughout the factory in a sophisticated and very effective network.

According to Hewlett Packard, computer networking, also called distributed data processing, has enabled us to take a giant step forward towards the ever elusive "perfect factory," where raw materials arrive on schedule and in the

right quantities, orders flow in and out smoothly

Production takes place at optimum efficiency, and inventories are maintained at high levels.

When all these factors are right, the quality of the goods produced must improve

Computers can, according to Hewlett Packard, assure quality before the fact because a problem can be discovered early in the production cycle.

"It can be remedied easily and inexpensively, compared with measures taken later down the line.

The steadily decreasing cost of computer hardware has placed it within the financial scope of even the smaller businessmen, who often reap the greatest benefits in relation to their computer investment.

HP however, points out that while hardware costs are decreasing, software costs are increasing.

## The mail man — eighties style

A postal service plan now in the laboratory stage in America may make it faster and cheaper to send a picture of a letter than the letter itself

The concept involved is similar to the telegram, but mechanised.

On a massive scale the American Postal Service thinks it could substantially undercut the cost of a first-class stamp.

Mailing a letter could mean taking it to the local post office where a machine that can read characters, transmits the information at a rate of 10 pages a second over telephone lines to another machine

This, in turn types the letter out again, folds it, stuffs it into an envelope ready for delivery.

Telephone Manufacturers of South Africa announces the appointment of Mr Fred Williams as managing director of TMSA and of its subsidiary, South African Moulded Plastics. TMSA is the Springs-based telecommunications company which is manufacturing the new push-button telephones which become available in South Africa from April 1.

## Seminar

A four-day seminar on Management Information Systems organised by the Centre for Business Studies of the Graduate School of Business Administration will be held at the school between April 7 and 10 inclusive

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in all



# The micro — it's new power for office of the future

"Of all the different aspects of business, which the microprocessor will affect, the office is likely to be the most profoundly changed"

This is the opinion of Mr Dan Remenyi, director of The Management Centre in the UK

Office work lends itself more to computerisation than any other aspect of business and the savings to be made are progressively larger.

Thus, George Westbrook in an unpublished paper in 1979 describing ICI's approach to word-processing stated:

"We bought our first word processor in 1976. It cost £11 000 and it saved one secretary whose annual salary was £2 600

"We now have 40 word processors and when we buy one today it costs £9 000 and saves a secretary whose annual salary is £3 700"

Mr Remenyi believes the office which saw the first commercial computer applications will also be the first place for mass proliferation of micro-processors.

The new micro-computers will perform a whole range of tasks related to information processing and include a wide range of office functions—from filing report generation, electronic mail, teleconferences through financial and management accounts to information from the external environment such as stock exchanges, currency rates and commodity markets.

The development of the micro-processor is of great

importance to the business world because of its cost, size, power and reliability

The micro-processor performs the same functions as the traditional computers, but instead of requiring the capacity of a large room and because computing power now costs tens or hundreds of dollars instead of hundreds of thousands it can be used in many more ways than thought of a few years ago.

The difference between a micro-processor and a micro-computer is that the former is an electronic device which can store and manipulate data in such ways as to provide intelligence to a whole range of products, equipment and computers.

A micro-computer, on the other hand, is a computing system, which incorporates a micro-processor as its central processing unit (CPU).

In addition to its CPU, it requires input and output devices such as terminals and printers, and devices which allow these elements to communicate with each other

As the size gets smaller, so too does the price. As a result, computing power is becoming ever more available to all business units, even the smallest.

In the past, change in the office has been very slow. Changes in office productivity have lagged behind those in factory

It is estimated that today's typical office worker is supported by only £1 000 worth of

equipment while the factory worker has about 20 times as much.

The office of the future will be very different. Each office worker will have the use of about £5 000 worth of sophisticated equipment — much of it computer based.

The major implication of a micro-computer in every office is that there will be a great improvement in the accounting procedures.

On the one hand the electronic office can be seen as a major challenge to jobs but on the other hand it can be seen as the removal of uninteresting work which allows individuals to concentrate on more challenging work

The office of the future could be a very exciting environment in which to work

It could produce considerable economies for all sorts of organisations, from the largest to the smallest

But to make it happen, will require a lot of effort not only on the part of the manufacturers but particularly on the part of management who have not so far in the area of office automation distinguished themselves as agents of change.

It will require managerial skill to make productive use of this equipment and sensitivity to achieve a willing acceptance of these developments by existing personnel.



# Chain stores put millions in computers

S. Tues  
3/5/81  
(179A)

## BIG MOVE TOWARDS POINT-OF-SALE TERMINALS

MILLIONS of rands are being committed to computer installations by chain and department store groups.

The groups are beginning a swing towards point-of-sale (POS) terminals, which are revolutionising shopping in the United Kingdom and Europe.

This became clear from a survey this week by Business Times of eight of the country's largest retail groups.

The move to POS installations is strongest among operations which have a firm leaning towards credit business.

But most groups are moving increasingly to computerising their retail operations.

POS terminals differ from the now common, stand-alone electronic cash registers (ECRS) in that POS terminals

By Andrew McNulty

are intelligent computers or are directly linked to a computer, and both provide and record a wide range of merchandising and customer-related information and calculations.

Latest to place a large order in this area is the Stuttafords group of department stores, which has just signed a R12-million order for 250 ICL 9512 point-of-sale terminals.

All the Stuttafords group's nationwide stores are to have the terminals, making Stuttafords probably the first such large operation to install POS terminals in a single swoop.

Credit sales account for a "fairly substantial" part of the group's business, according to the financial controller, Neville Davis.

Aims include superior customer service through better and faster processing of transactions, improvement of sales information for merchandise-buying decisions, improved control over stock and cash, and elimination of costly and time-consuming manual procedures.

The use of bank credit cards, for example, is showing an annual growth of 40% in the group's stores, creating major manual administrative costs.

Mr Davis says that the terminals are to be installed by the end of September. The second step will be to install a data-collection function by about May next year, and then by June to institute a fully customer-related function by June.

Merchandising functions, considered the most difficult, will be done over about two years.

Later this year a decision will be made about further expansions for the national system — whether by the route of a single powerful mainframe on line to regional centres or mini-systems at the regions — but this could require further spending of about R500 000.

Pick n Pay's financial director, Cliff Hurst, says POS terminals were installed at the Boksburg Hypermarket in 1976 and are now used in seven Hypermarkets and other major stores.

Around 750 terminals are used at a total 15 installations. All are NCR machines using a standard software package designed for P & P's requirements.

At an average R4 500 a terminal, the investment is about R3.5-million.

Low-cost word-processing systems have now brought electronic word processing within the reach of most small businesses. One of the cheapest on the market is the Trident Protect 1. Based on the Apple computer, Protect 1 is a powerful desk-top word processor with screen, storage and fast printer which retails for just under R7 000.

The group is moving steadily towards greater computerisation in all the stores, Mr Hurst says, and 13 decentralised regional accounting installations each represent investments of about R75 000.

However, heavy spending — probably about R5-million — will be required to introduce POS systems to the 40 stores not yet using them, and it could take about five years to complete the process.

Tatly Hewson, general manager, management services, at OK Bazaars, says that the group is bringing all stores on line to a major system based in Johannesburg.

Five stores have been brought on line and 20 more

will follow as Post Office lines become available, with the job expected to be completed in the next two months. All OK stores are expected to be on the system by the end of the year.

The system includes two IBM 4341 mainframes at head office, 400 IBM and Telex screens and 180 printers. Total cost is about R2.5-million.

The OK plans using only ECR machines which cost about 25% of the price of a POS terminal.

"Except for the very large stores such as Hyperamas, we have ruled out POS at this stage. We are a cash business and they could not be cost-justifiable yet.

"The last thing we could

afford is to have the slowdowns at the check-outs which are likely to result," Mr Hewson says.

The heavily credit-oriented Edgars group moved on to POS systems two years ago and now has 14 stores on line, says data-processing manager Robert Maydon.

More than R1-million has already been committed, and this could rise to a total investment of R9-million as terminals are introduced at all the group's stores — 90% of the total chain are still to go on the system.

NCR-supplied 2140 ECR machines have been installed at four of the group's Jet stores, which are not credit operations.



Step-up in <sup>S Times</sup> 19/4/81  
electronic <sup>1792</sup>  
bank tellers <sup>1792</sup>

By Tony Hudson

THE change to electronic banking takes another big step this week with the announcement that two more organisations are to introduce automatic tellers (ATMs).

This brings the number of banking organisations with ATMs to four — the United Building Society, which has had them for some time, the Standard Bank which starts operating next week, the Natal Building Society, which hopes to be operational by the end of the year, and Volkskas on a limited scale.

John Bennet, NBS managing director, tells Business Times that the decision to go on to ATMs was taken a year ago, but because of a 14-month lead time from IBM, the first delivery is due within a couple of months and the scheme should be operational by the end of the year.

Mr Bennet would not say just how many terminals would be installed, but he hoped it would be between a third and half of the number operated by the UBS, which is around 100.

The ATMs, which cost R40 000 each will be installed at points of sale where NBS already has cash-card terminals.

The difference will be that present NBS terminals read the card and then produce a printed slip, which must be handed either to a teller at an NBS branch or a cashier in the supermarket with the terminal. The ATMs will dispense the cash directly.

The first batch will be concentrated in the Durban areas, but Mr Bennet says that at a later stage the society could well install them in the Transvaal.

The society has written its own software for the ATMs, much of which has been based on that for the current terminal system, which has been debugged.

IBM does not supply the full programme, says Mr Bennet, and the customer has to add his own refinements to the basic programme. NBS will be using its existing computer facilities to run its ATMs.

Total cost of the initial phase of the project, including software, will be in the order of

( To Page 3 )

Continued →



S. Times 17/4/81

# Electronic tellers step-up

179

o From Page 1  
R2-million, says Mr Bennet  
Standard has been running its operation on a trial basis since January, with only staff using the system. However, it will be available to all current account holders from Tuesday.

Main reason for this, says Bill Jones, Standard's general manager for computers, is that there have been fluctuations in

the electricity supply which could have caused problems with the R40 million on line computer centre at River Club in Sandton.

Current services provided by the Standard ATMs are cash withdrawals of up to R200 at a time and a limit of R400 a day, cash and cheque deposits, account balance readings and a mini statement recording the

last six transactions.  
But Mr Jones has more up his sleeve. He says that within a few months the system will have additional features including access to savings accounts, credit-card payment facilities and cash withdrawals on a credit card.

The bank is still examining the credit card side of the operation, and may decide that the 300 000 cards on issue could pose a tremendous burden on the system.

If the the project team feels that this could be the case, the scheme will be introduced in phases. The first one could be to limit credit card withdrawals to those holding the bank's autocard.

The future extensions of the system, says Mr Jones, could include a bill payment system where the customer feeds certain codes into the ATM and the bank automatically pays the bill.

However, there are many problems inherent in such a system, and these will have to be ironed out before it could be introduced.

At present the bank has 20 machines operational on the Reef in high-density shopping areas and five more to be installed.

It hopes to have 75 by December and will be operating in most major centres by the end of the year. There are another 100 in the pipeline.



# Before you can say 'debit'...

SOUTH African banks have spent more than R20-million to provide what they believe is the world's most advanced system for the clearing of cheques.

Called the Automated Clearing Bureau, the highly computerised Johannesburg branch handled 140-million cheques last year, and expects to pass the 150-million mark in 1981.

The Cape Town branch handled 47-million cheques in 1981, and the Durban ACB handled 38-million.

Thanks to advanced technology, the days of bank clerks laboriously checking and sorting each cheque deposited with their bank are soon drawing to an end.

In banking, as in any business, time is money, and the three branches of the ACB are saving the banks hundreds of thousands of rand a year by ac-

ording to the ACB's general manager Mr Eben Venter.

The ACB is run by a small, well qualified staff, with most of the work being done by computers.

The amounts of the cheques are coded by banks and sent to the ACBs in containers, which carry a maximum of 2 000 cheques each.

The containers begin arriving in bulk at the ACB at about 4pm, and the bureau works "until everything is finished", usually after midnight.

The cheques are sorted into bank, branch and account numbers by a computer which handles 1 000 cheques a minute. The details of each cheque processed are transferred onto magnetic tape.

The Johannesburg ACB handles cheques from branches as far afield as Pretoria North,

South African banks are making increasing use of computers to speed up their services and cut costs. ALEC HOGG recently visited the Automated Clearing Bureau in Johannesburg — one of the most advanced of its kind in the world — to find out about how the banks sort cheques.

Sasolburg, Nigel and Western Areas.

Details of the transactions are transferred by computer onto individual account ledgers before the banks open the next morning.

This means that if you write out a cheque in Pretoria, and have your banking account in Sasolburg, the amount of the cheque will have been debited to your account by the time the bank opens the next day.

In the past, it could take as long as a week for a similar debit to be passed.

The old system allowed "kite flying" to take place — which was particularly evident during the 1988/89 stock market boom on the Johannesburg Stock Exchange.

"Kite flying" was a system whereby someone would operate two banking accounts, one, for example, in Pretoria and the other in Johannesburg.

The person would deposit one of his Pretoria cheques, for say R10 000, in his Johannesburg account, and then draw cash from the Johannesburg account on the strength of this deposit.

As the cheque took about a week before it was debited to his Pretoria account (ie when it was received by the bank there), he could utilise the cash drawn in Johannesburg in that time.

Just before he knew the cheque would reach Pretoria, he would drive through and deposit a cheque drawn on his Johannesburg account for R10 000 which would put that account back into balance.

Theoretically, the account holder did not have R10 000, but by "kite flying" he could finance deals in stocks and shares.

With the ACB network, this

practice has been eliminated and cheques from Durban and Cape Town are also cleared the same day.

Cheques drawn on banks in the so-called country areas, however, still take a few days to clear, but Mr Venter says in time the whole country could be tied up in an ACB network.

The ACB's existence was born out of an idea in 1969 when the South African Bankers' Automation Standards Committee (Sabascam) was established to find ways for banks to cut handling costs.

After examining banking systems all over the world, Sabascam decided in 1971 that automatic clearing bureaux were the best way of cutting costs, and the first ACB, in Johannesburg, became operative in 1973.

The Johannesburg ACB handled 80-million cheques in its first full year (1974) and since then the figure has grown by about 7% a year.

The Johannesburg bureau proved so successful that an ACB was opened in Cape Town in June 1977, and one in Durban in November 1978.

To finance the ACBs, the country's clearing banks (those which operate cheque accounts — including the Reserve Bank) provided initial capital in proportion to their size.

The bureaux are operated on a non-profit basis, and banks pay a monthly fee calculated on the number of their cheques cleared by the bureau.

Because of the advancing technology, the ACBs' machines have been upgraded twice (in 1975 and 1978), and Mr Venter says the present machines will be replaced in 1982.

An example of the manpower saved by the ACBs is the size of their staff.

In Johannesburg, for example, 180 people are employed. Most of them work directly with cheques rejected by the computer — usually because they are folded or have staples in them.

The rejected cheques constitute only 1,5% of the total number handled, and more than 100 people process them manually — in more time than it takes the computer to do the remaining 98,5%.

The ACB costs R7-million a year to run, a huge saving on the manual process.

The computers are leased, which also holds tax advantages for banks, so the effective saving is even greater.

Although ACBs were originally established to cut the costs of handling cheques, Mr Venter says there are many possibilities whereby the ACBs can help cut down on other routine bank administrative work.

One project has already been worked out with Roodepoort Municipality whereby all the city's ratepayers will have their monthly water and electricity charges automatically debited to their accounts by the ACB.

Social Welfare and Pensions is already on an electronic funds transfer system through the ACB's magnetic tape service, and 200 private companies are also making use of it.

As there are always some queries, ratepayers will be sent a statement from the municipality up to three weeks before their banking account is debited, so complaints can be handled.

Mr Venter says this service can be passed on to Government departments like the Railways, the Post Office and even large private companies, whereby salaries are automatically put on magnetic tape at the ACB and credited directly to the individual's account.

This will cut out expensive paper work which currently has to be done at the person's place of employment and at his bank, and also the human errors which can often be embarrassing for all involved.

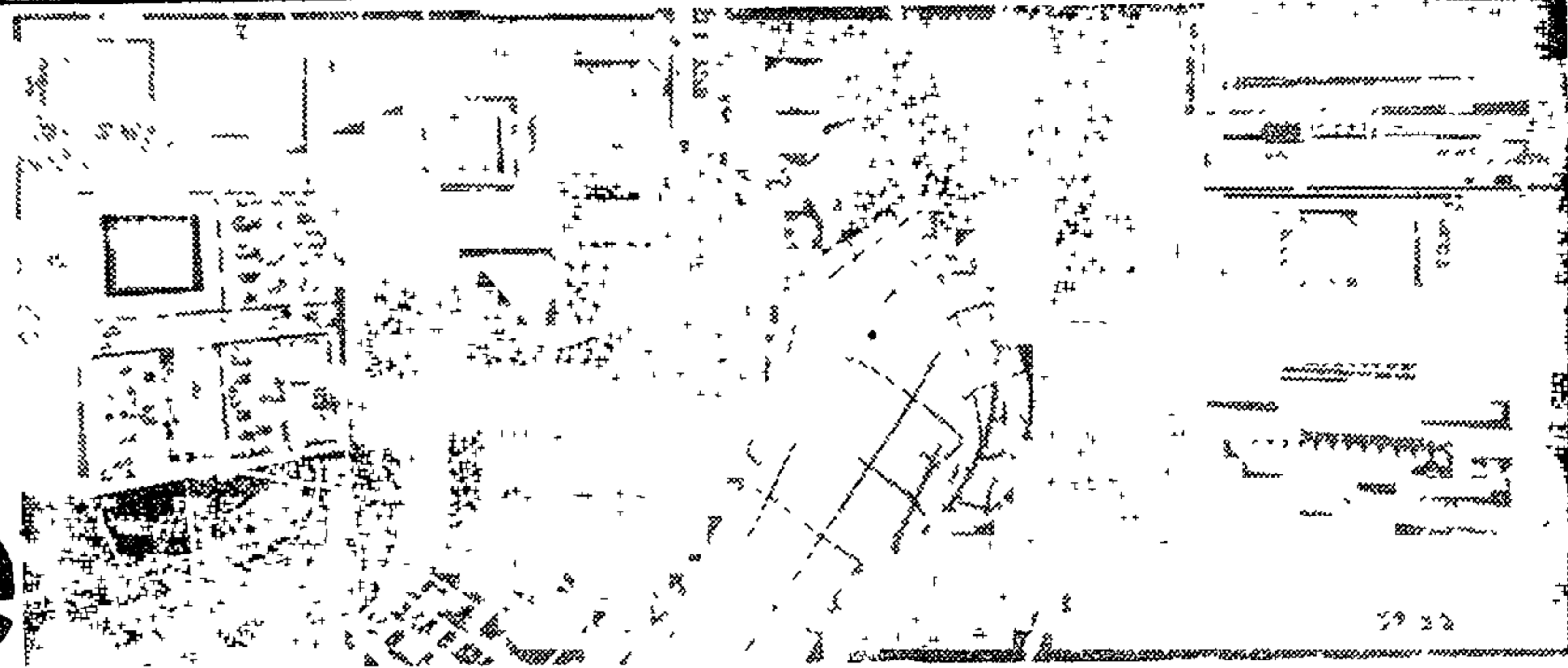
South Africa's ACBs are probably the most advanced in the world. The only possible challenge comes, surprisingly, from Hawaii, where banks have got together and decided to implement a similar system in the near future.



NATAL University master technician Doug Beard — like others he has had tempting offers but for the moment prefers the learning possibilities of working in a university.

# The big scramble for electronics whizz-kids

SHORTAGE OF TECHNICIANS HAS BOOSTED SALARIES, SET UP PIRATING... AND THE PUBLIC SECTOR HAS BEEN THE FIRST TO FEEL THE PINCH



COMPUTER technicians are riding high on a tidal wave which has been building up over the past few years and is now sweeping them along in the category of "most sought after skilled worker".

It's a situation that's great for them but bad for others and it's costing the country a fortune in lost efficiency and potential productivity.

The wave is the evolution in micro-electronics which is rapidly transfiguring the face of South Africa in many areas, from wristwatches to banking, postal and defence computer systems

World-wide it was a wave that few saw coming, with the result that there is an international shortage of trained technicians. The situation has been magnified in South Africa by the booming economy. Recent figures show the

growth of both electronic and electrical industries outstripping the growth of the gross domestic product and of the rest of manufacturing industry by more than four times.

"We are now in a situation similar to the acute shortage of certificated engineers 10-15 years ago," management consultative specialist Des Froneman said.

"I call them red flag jobs, and they are characterised by a lot of enticement as firms try to pirate each others' staff, a lot of mobility and a lot of agitation.

"Technicians who might in ordinary times draw a salary of R12 000 are now getting offers of up to 40 percent higher — even R18 000, with maybe a car thrown in it's the product of desperation."

The first to feel the pinch in any scramble for skilled labour are the big public institutions such as the Post Office to some extent and the Railways, who are losing computer

and other technicians at a punishing rate.

"We seem to be training technicians and electricians for the private sector," one frustrated government official said: "It costs us R20 000 to train some of our computer technicians and such a person is worth another R10 000 to us in terms of his experience."

## Shortage

The Post Office on the Witwatersrand is losing technicians who work on the data lines linking the new micro-electronic systems at a rate of 60-70 percent a year. "We have a staff shortage in this area of 55 percent or about 200 trained units on the Reef," said staffing director Chris Marais.

"When we discuss data line problems with firms we actually speak to ex-Post Office staff.

At these rates, and with a training cost of about

R10 000 a technician, staff losses through private sector pirating run into millions of rands for the public sector every year.

The exodus of technical staff has prompted its own internal scramble to find ways to make employment opportunities more attractive.

William Ridgard, Deputy Postmaster General, recently announced the setting up of a special committee to examine the cause of the high numbers of resignations from the telecommunications services and ways to cope with the current crisis.

Main sufferers of the Post Office crisis range from private subscribers, who now have to wait several months for a phone in some areas, particularly on the Reef, to big institutions reliant on data lines — the vital system linking their computer networks.

"At present we have a waiting list of 1 000 ap-

plicants for data lines on the Witwatersrand," said Mr Marais. "Some of these are waiting for other things to get off the ground but many of them already have their show together and are just waiting for the lines."

"It's the computer users who take our staff," said Mr Ridgard.

"Our technicians work on the premises of these firms so they have plenty of opportunity to observe them, they take our best. But then we can't maintain the lines and their computers go off the air. When that happens to firms the size of Barclays Bank or OK Bazaars you're talking about a lot of money.

"It can take a long time to track a fault on a data line and you need a range of skill groups to do it."

A Railways official said the loss of skilled staff to the private sector was one of the main impediments to running a satisfactory service.

"Representatives of firms will even go to the

university, in the case of engineers, and buy promising students being funded by the Railways out of their contracts with us. We never get our full quota from those we train."

However, Gert Benade, director of manpower for SAR, said that while experiencing similar losses to the Post Office in some areas of the country, the Railways had dramatically stepped up training of computer and other technicians by three times this year to meet the situation.

## Problems

"We have some regional problems but generally feel we've contained the situation," he said. "But if the boom continues things could get worse. But we are resigned to the fact that we will lose trained people to the private sector. It's been going on for years."

S. Twome

28/6/81

(178A)



28 June 1981

## Problems

Professor Lee Natrass, who heads the department of electronic engineering at the University of Natal, said: "A lot of the firms who are employing micro-processing can't afford to train their own technicians, so they put the money they might put into training into higher salaries than the public sector can pay. Naturally the public sector feel frustrated, particularly when they are accused of failing to provide good service."

Skilled labour scrambles produce many negative side-effects. People pirated by the private sector paint in glowing terms the gains they will make, spreading dissatisfaction among those left behind.

They also help to create dissatisfaction among less sought-after categories of worker, who are nevertheless on a par with them in terms of skills and training.

Endemic pirating of skilled workers makes for short spells of employment, and that hits national productivity.

"It takes at least a month for a person to become effective in a new job and he becomes less effective in the month he leaves. If he stays only six months before being snapped up by another employer you get only four effective months of work out of him."

Recruitment costs also soar.

## Efficiency

Des Froneman says. "The cost of getting a job back to maximum efficiency when a skilled operative leaves is reckoned to be 10 times the monthly salary. So we're talking about some R15 000. To that you must add about half that amount again in recruitment costs, giving you a figure of R23 000 every time you replace a man. In the present climate it's not uncommon for technicians to change jobs more than once a year."

Despite the inflated salaries, firms are often having to take applicants for jobs which are two-to-four years ahead of their ability and experience. "The technicians then find themselves out of their depth," said Mr. Froneman, "and they can't use the equipment to maximum efficiency."

One of the reasons for the acuteness of the scarcity of technicians in South Africa is that they are drawn only from whites and to some extent Indians, representing only a quarter of the population, but the microelectronics industry is growing in the service of the majority of the population.

"The industry will simply have to be opened up to all population groups and the necessary training will have to be provided," said Professor Natrass.



MANPOWER SHORTAGE FORCES TERMINAL ACCEPTANCE

Mining men are getting to know computers better

Sept 12/7/81 Data 179

MULTIMILLION expansion commitments by the major mining houses, coupled with the serious skilled manpower shortage, have generated a growing need for the use of advanced technology in the mining industry, particularly coal.

Fred Jones, mining consultant at Cybernet Data Services, Control Data, said the application of advanced computer technology was adding new dimensions to the area of planning and problem solving in the industry

"Mining men have been content to view the new 'non-mining' techniques such as computers with particular suspicion," said Jones, "probably because, up to now, most facilities offered to them have been difficult or cumbersome or have not been relevant to the technical problem

CHANGE OF HEART

"But with the shortage of qualified engineers shadowing the expansion projects, more and more mining men in South Africa are now showing a willingness to accept the value of computers in their field

Business Editor

"They take over the menial tasks and provide easy access to relevant information on which technical decisions can be based," he said

Control Data has established specialised facilities to give mining management and professionals access to the latest computer technology on an "as needed" basis

These facilities are staffed by a specialist mining support group which includes mining engineers, geologists and computer analysts who have specialised in mining applications

"We believe an engineer would rather talk to another engineer who has knowledge of computers than a computer salesman who knows a bit about engineering," said Jones

"In addition, a specialist bureau operation allows total flexibility. Access can be project-related and need not necessarily constitute a major expenditure decision affecting many other departments unrelated to the project in hand"

Four Cybernet mining systems which have already been applied successfully by Control Data Services in the South African environment are

o A mineral evaluation system which logs, edits, models, controls reports and analyses data

o An investment model designed to help in mining exploration and developing decision making. It can be used effectively in validating the economic characteristics of geological models, evaluating property submissions, monitoring exploration progress and for determining project acceptability before the decision to proceed with mine development

MINE DESIGN SYSTEM

A system of three-dimensional polygons is used to perform mine design and ore reserve analysis. There is also an economic analysis programme which calculates cost and potential profit on a hole-by-hole basis

Jones offered several other suggestions on alternative means of ensuring a reliable and effective computing service for a mining company. He said

o Technical computing responsibility should be assigned to a person such as a mining engineer who preferably has knowledge of the system's requirements. With today's advances it was easier to learn about controlling systems than to learn about mine planning, geology and engineering.

He advised potential users o A reputable supplier of technical computer programmes should be located who can also ensure the programmes are installed successfully and, most important, provide consulting assistance. A significant advantage could be derived from dealing with a supplier who could also provide practical education to professional and technical personnel

o All systems should have backup personnel to ensure continuity in case of loss of staff

o The system should be tested on a trial basis before commitment to purchase

Jones said that computers, properly managed, could assist mining personnel to "work smarter, not harder" and to make more effective use of the scarce technical resources of the country

cont ↓



fied engineers' studies showing the expansion projects, more and more mining men in South Africa are now showing a willingness to accept the value of computers in their field

"That computer technology is allowing the mining professional to have direct access and personal control over the computer process has certainly added impetus to the change of heart"

But Jones warned that computers did not have the ability to increase the productivity of engineers and technicians

'Data Services in the South African environment are

- A mineral evaluation system which logs, edits, models, controls, reports and analyses data on almost any mineral deposit
- A multiseam coal deposit evaluation system designed for layered deposits such as coal, borate and phosphate
- Storing, logging and editing drillhole data, the system produces models, analysis and reports on specific properties in a fraction of the time previously expended

THERE were some relieved sighs on the Johannesburg Stock Exchange this week when gold shares shook off their recent weakness and refused to be goaded into a further decline by a bullion price below \$400

The reversal may not spell a major recovery, but it spilled onto the industrial board which pulled the JSE Actuaries Industrial index off a three-month low

Bullion fell below \$400 on Wednesday afternoon in London, fixing at \$397,75

This level, the lowest since November 1979, was prompted by stop-loss selling following announcements from leading US banks that prime lending rates would be raised further from 20% to 20,5%

This boosted the dollar even further on foreign exchange markets. The US currency rose to a 23-year high in French francs, and to a 2,47 parity with the Deutschmark

After this low, gold rallied to around \$400 as a result of short-covering and small central bank support

But there was no sign of the central bank buying which many had predicted would push bullion back onto a recovery path. This was not surprising, with the dollar remaining so strong and talk of bullion breaking below \$400 for a sustained period

This view tends to be encouraged by statements coming from the likes of US Treasury Secretary Donald Reagan who said pressure on US rates would not abate for some time

Of course the contrary view, which has supported gold, is that the crippling cost of money in the US and the attendant social/economic problems, will force the Reagan administration to ease the purse strings

Against this background gold shares gained 9% on the week

To a large extent the rise was from an oversold position prompted by heavy selling,

particularly from the US, and a wide Financial Rand discount. And, although the dollar's rise is the major bear influence on gold, it also means higher rand receipts for local mines

The JSE might look better now, but falling dividends from gold mines and the spectre of continued cost increases, could spell an early end to this week's rally

At present bullion's hesitance to cross the \$400 level on the way down is fuelling the bulls. But as with most supposed "psychological barriers" \$400 could be replaced quickly by a lower level

In South African terms the dip in gold promises certain unpleasant ramifications

Finance Minister Senator Owen Horwood expects gold to recover substantially by the year-end on a resurgence in industrial demand.

At this time of the year buying from this sector tends to be quiet which lends credence to his forecast. But he admitted on returning from Europe that South Africa could end the year with a moderate current account deficit on the balance of payments

He also cautioned that falling bullion cuts the State's major revenue source so there might have to be compensatory steps taken to fill this void. In other words taxes may have to rise

For the JSE though this prospect is not bullish with growth a prime consideration. And with company results continuing strongly, particularly in the consumer sectors, the market is underpinned to some extent



# NOW ROBOTS ARE MAKING . . . ROBOTS

By ANTONIO KAMIYA in Tokyo

ALTHOUGH they bear little resemblance to the androids of "Star Wars," industrial robots are rapidly taking over the boring, repetitive factory jobs traditionally handled by blue collar workers.

Industrial robots are here to stay, and their numbers will increase. After a visit to a futuristic factory at the foot of Mt. Fuji, economist Takeo Tamarushima was ecstatic. What he saw was a

dream for managers but a potential nightmare for workers — the world's first fully automatic and robotized factory.

At the sprawling Fujitsu-Fanuc Fuji plant, robots are busily turning out, yes, more robots, around the clock.

During the day only 100 workers man the factory. By night the plant is completely automated with only one worker tending the shop.

Industrial robots don't walk and don't talk, but they are versatile and smart. Equipped with a computer brain and arm-like projections and grippers, they already join the payroll of an increasing number of Japanese factories.

"The last stage of computerization is robotization," predicts Tamarushima. Robots play a significant role in boosting Japan's productivity. Toyota and Nissan operate plants where 90% of the work is done by robots.

Ten years after the first functional robot was built, more than 130 firms in Japan have jumped onto the robot bandwagon, a market that is growing 50% a year.

But despite all the hoopla, robots is still very much in the formative age. Because of their limited brain power and manipulative skills, robots now do jobs shunned by humans — loading, stamping, presses, spraying paint

in confined areas and making the welds day in and day out.

And a robot is still expensive, generally priced around \$45,000.

But at last count, nearly 10,000 robots had inched their way into Japanese factories, replacing at least as many workers. At 2% to 3%, unemployment is low in Japan, but the Tokyo government has launched a study on how the robots are affecting the job market. — UPI



# Report warns on black job needs

Star 22/9/87 (179A) (W)

CAPE TOWN — South Africa could ill afford the substitution of technology for labour, the Bureau for Economic Research at Stellenbosch University argues in its September analysis of economic trends.

The report said the use of capital instead of labour was a trend expedited by the comparative cost advantages.

As tax incentives also tended to encourage capital intensive projects, it was not surprising that the rate of growth in black employment was not much more than keeping pace with the aggregate growth of the black population.

Commenting on regional activity, the report said the cycles seemed to confirm a degree of latent momentum still present in the economy.

The cycle for Port Elizabeth — a region which experienced a phenomenal rate of growth in building activity in 1980 was still being influenced by the high level of building plans approved in previous periods.

Cape Town, normally a source of interest if not concern, was keeping abreast of most regions, the report said.

In the South African business cycle, the only growth sector in liquor

production was beer production.

The bureau report said South African wine and spirits producers would either have to look to export markets or devise highly ingenious marketing and pricing strategies to overcome economic, and lately, social resistance to their products on the local market.

Clothing and textile production was still showing commendable growth, while tobacco and food products were showing a decline in the volume of production.

The report, said judging from the trends emerging from vehicle sales in the first seven months of this year, more than 400 000 new vehicles would probably be sold in 1981.

The announced expansion

plans of the industry were clearly justified in view of the growth potential.

In the production goods sphere, machinery production — in contrast to metal products — was maintaining a steady growth rate.

In the private sector building activity, the aggregate value of building plans was tending towards a no-change situation, which in real terms meant that the volume of building approved was declining.

The bureau report said the hotel sector was emerging as a service industry for the business community. The improved occupancy rate was a feat achieved despite stagnation in the growth of bed-nights sold — Sapa

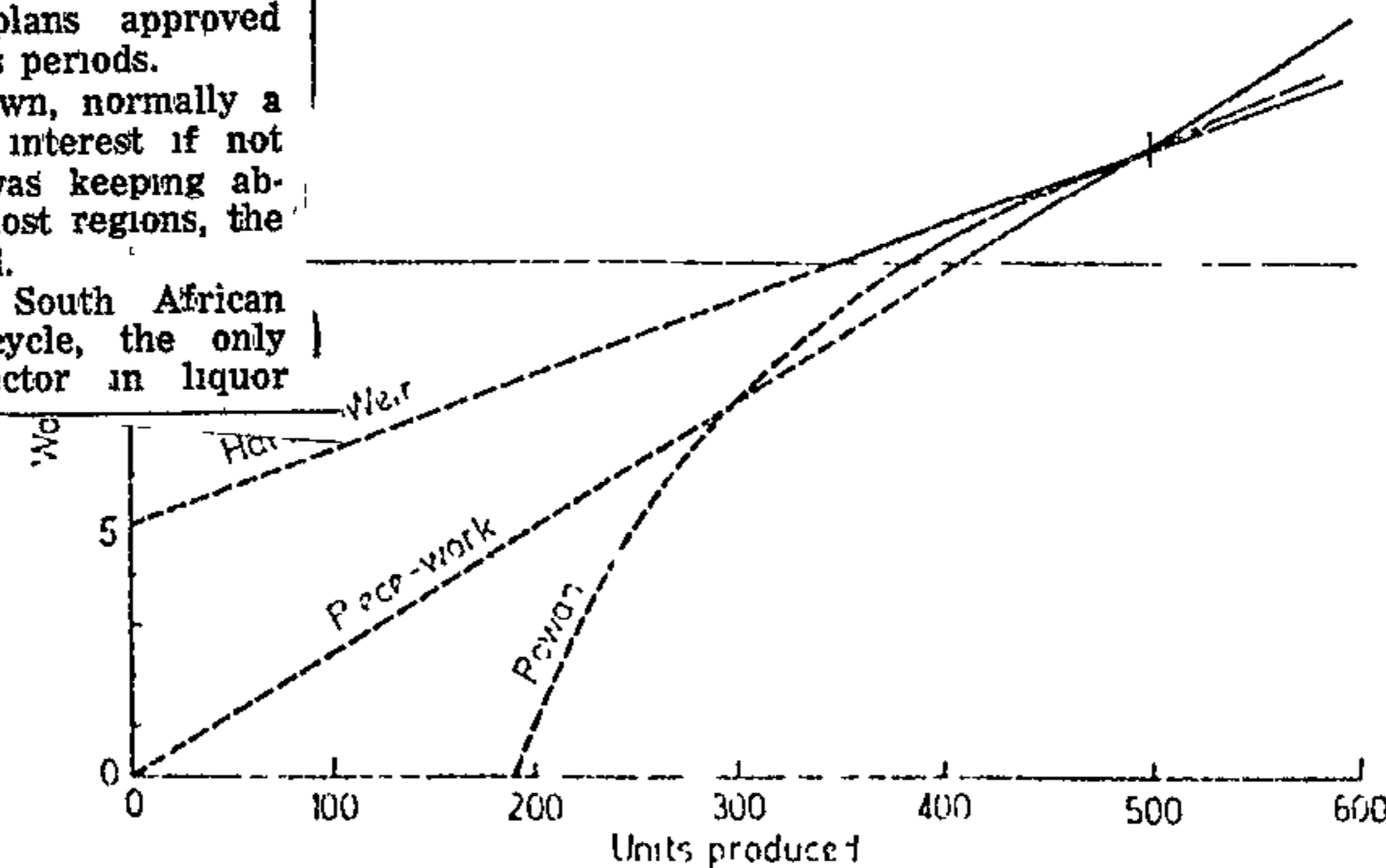
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Operator's Earnings under Piece-work, Halsey-Weir and Rowan Schemes, all Adjusted to Give the Same Earnings at one Point



# SA warned not to swop labour for technology

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SOUTH AFRICA could ill afford the substitution of  
technology for labour, the Bureau for Economic Re-  
search at Stellenbosch University said yesterday in its  
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The report said the use of capital instead of labour was a trend expedited by the comparative cost advantages

As tax incentives also tended to encourage capital intensive projects, it was not surprising the rate of growth in black employment was not much more than keeping pace with the average growth of the black population.

Commenting on regional activity, the report said the cycles seemed to confirm a degree of latent momentum still present in the economy

The cycle for Port Elizabeth — a region which experienced a phenomenal rate of growth in building activity in 1980 — was still being influenced by the high level of building plans approved in previous periods

Cape Town was keeping abreast of most regions, the report said

## Beer

In the South African business cycle, the only growth sector in liquor production was beer production. The report said South African wine and spirits producers would either have to look to export markets or devise highly ingenious marketing and pricing strategies to overcome economic and lately, social, resistance to their products on the local market

Clothing and textile production was still showing commendable growth, while tobacco and food products were showing a decline in the volume of production

The report said judging from the trends emerging from vehicle sales in the first seven months of this year, more than 400 000 new vehicles would almost certainly be sold in 1981. The announced expansion plans of the industry were clearly justified in view of the growth potential

In the production goods sphere, machinery production — in contrast to metal products — was maintaining a steady growth rate. — Sapa

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# ICL package to tackle problems of plant control

Star 21/9/81 (179A)

ICL is making a determined push into the field of computerised manufacturing techniques.

This is spotlighted in its new planned-maintenance package, the second major package introduction in the last two months aimed at the capital intensive manufacturing, processing and service industries, at the Milner Park exhibition.

Planned maintenance provides a computer based solution to the main problems in plant control: The scheduling of routine work — reacting to changing schedules and analysing performance of plant history — and directing resources where they can be most effective. As the package covers all aspects of planned maintenance it leads to a full plant-maintenance management system for any organisation with a medium or large investment in machinery, plant, buildings and vehicles.

The package will run on the ME29, 2903, 2900 and 1900 series ICL computers so there are no problems of compatibility during future computer enhancements.

ICL's application marketing consultant Mr Phil Darby says "The market for the package is big. Effective planned maintenance has been shown to give substantial benefits to

a wide variety of industrial sectors, including mining, manufacturing transport and service industries, public utilities and government bodies, commercial and military aircraft maintenance and so on.

"Some of the benefits reported by users have been 30 percent reduction in breakdowns, 10 percent reduction in spares holdings and a tenfold reduction in clerical effort, all contributing to an increase in production and profit."

As the package is designed to meet the diverse needs of the market, it is strictly modular in structure and users buy only modules which provide the facilities best suited to their requirements.

## OPERATIONAL

With this one-line video terminal-based system individual modules cover plant file-creation and maintenance, maintenance scheduling, a reporting module, rolling-schedule module, feedback module, history module, usage-based scheduling, on-line inquiry and file update. All the modules have been working in ICL development sites for some time, have been thoroughly tested under operational conditions and are ready for use as "load-and-go" applications.

Planned maintenance is one of three in ICL's latest range of product solutions to the problems faced by the manufacturing and

production control industries. The others are Omac 29 — ICL's IDMS-based manufacturing package providing an advanced production-control system — and their factory-terminal systems which provide the shopfloor with up to date, fully validated details of work in progress.



59.	South African News, 11.5.1901
60.	Cape Times, 16.2.1901; 661-1901, p.11.
61.	Cape Times, 9.2.1901
62.	Cape Times, 14.3.1901
63.	G.61-1901, pp.129, 177, 181, 187, 222, 230.
64.	NA 494. Matland Municipality to NAD, 15.5.1900; Assistant Resident Magistrate, Matland to Secretary, NAD, 23.5.1901; Stanford to Law Dept, 29.5.1901.
65.	NA 617 t1883. Police report, 14.10.1903; NA 598 f1525. Secretary, NAD to Commissioner, Urban Police District.
66.	3/MLD-3. Minute Book of the Village Management Board, 19.9.1900. The Old Outspan in Matland had been granted to the Cape Town City Council by the government for sewage purposes. The site proved unsuitable but it was later suggested for the location. For Indians see p.p.30-31
67.	3/MLD, 16.1.1901, 1.2.1901.
68.	G.21-1902. Cape Peninsula Commission.
69.	S. Judges: Poverty, Living Conditions and Social Relations: aspects of life in Cape Town in the 1800s. M.A. (Cape Town, 1977); A Lombard: The Smallpox Epidemic of 1802 in Cape Town with some Reference to the Neighbouring Suburbs. B.A. Hon's Research Essay, UCT, 1981.
70.	Cape Town. Mayor's Minute, 1899
71.	E.B. van Heyningen: 'Refugees and Relief in Cape Town, 1899-1902', Studies, 3, 1980, pp.69, 90, V. Bickford-Smith: 'Black Labour at the Docks at the Beginning of the Twentieth Century'. Studies, 2, 1980, p.92.
72.	See, for instance, the case of Kosiye Zeeman, who earned £2 - £3 a month as a seamstress. R. Hallett. 'Police, Pimps and Prostitutes - Public Morality and Police Corruption'. Studies, 1, 1979, p.9; E.B. van Heyningen. 'Refugees and Relief in Cape Town, 1899-1902', Studies, 3, 1980, pp.63-73.
72a.	V Bickford-Smith: The Impact of European and Asian Immigration on Cape Town: 1880-1910. Unpublished paper, History Workshop 1978.
73.	Cape Town. Mayor's Minute, 1897-98, 1898-99.
74.	D Pincock: 'District Six', Plans, 1980, pp.1-13. Pincock gives the most detailed analysis of slum property available.
75.	Cape Times, 9.3.1901, 11.3.1901.
76.	Cape Times, 20.4.1901, 15.6.1901.
77.	Cape Times, 17.5.1901, 21.9.1901, 9/CI 1/1/1/53, 20.5.1901.
78.	Cap
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**Now robot welder**

By Andrew McNulty

Robot welders are among new automated technologies that are being offered as solutions to the country's manpower dilemmas - skills shortages and a surplus of unskilled labour.

The Robo 500, just landed in South Africa by Fedgas from Cloos in Germany, is described as a compact and versatile robot welder which offers the user maximum welding capacity on relatively small floor space.

It is also easy to programme and 10 welding parameters can be preselected and executed in one welding programme.

Klaus Weber, manager of Fedgas's welding division, claims that the robots produce a consistently high quality weld and save up to 55% on time required for a job.

18.2.1901; MOH 27 f214.

1007. Inspector of

attention into the housing



# DTS systems poised for SA gold strike

DATA Terminal Systems (DTS), the world's No 2 seller of point-of-sale computer terminals, is poised for a major advance into the South African market.

So says Karl Saller, DTS's managing director of European operations, who is now visiting the offices of the local DTS distributor, Computer and Retail Equipment.

DTS, which last year recorded \$124-million in sales to distributors worldwide, has already taken the first step in its projected breakthrough drive via the recent sale of R5-million worth of point-of-sale terminals to Pep Stores.

Mr Saller adds that several more substantial contracts are in the pipeline for equipment whose sales will accelerate even more rapidly once South African retailers introduce the system of scanning goods with lasers — a system currently operational in 3 000 US stores and in many outlets throughout Europe.

He comments "The food-store industry stands on the threshold of a revolution in retailing — a revolution that will see the widespread use of advanced, easy-to-use systems at virtually every location.

"It is a revolution that will reverse the tide of shrinking profits and productivity for ever."

By John Spira

"Since its inception, DTS has brought a new vitality to its industry by listening, responding and specialising in the needs of retail business round the world.

"It has concentrated its resources in the development of advanced, innovative systems with an important difference. They need no backroom computer for full intelligence or for full flexibility.

"Our family of systems contains microprocessors and mass memory for the power of a computer in a single cabinet. They stand alone. And they offer computer-like benefits for half the price.

"Our Model 540 is a complete front-end cash register and reporting system in itself. It can also serve as a store-wide tool for control and management information.

"And, with communication options, it can form the basis for a total, chain-wide network of data flow and decision-making."

for the procurement of labour the immediate interests of the headmen were inimical both to capital and to labour in a developing capitalist MOP. Having dealt with the role of the headmen we discussed the high incidence of industrial action at the time, in terms of labour consciousness. It was argued that while a proletarian consciousness was clearly emerging, the demands of labour at the time indicated a desire for justice and fair treatment rather than a class consciousness based on the inherent exploitation of capitalism. The precise nature of labour consciousness was firmly located within the transition from a pre-capitalist to a capitalist MOP. We concluded that the relative strength of labour at the time was precisely related to the fact that wage labour provided a mere supplement to subsistence agriculture in the Transkei. Finally, we discussed the relative strength of labour in terms of the competing interests of large-scale employers. The initial process of combination amongst capitalists and their increasingly close connections with the State (both processes which were only concluded later in the twentieth century) can, we suggest, be clearly seen in its embryonic form during the period 1900-04.



# LIFT OPERATORS

## LOSE THEIR JOBS

### TO AUTOMATION

ARBUS 18 (158)

By Vivien Horler

AUTOMATION has caught up with three of Cape Town's dwindling band of lift operators.

The scores of doctors and hundreds of patients who pour into the Medical Centre on the Foreshore every day will now be greeted by gleaming stainless-steel and buttons instead of the smiles of Mr Robbie Robertson, Mr Armién Roode and Mr George Nardoo.

It was a real surprise for me when they told us about the new lifts,' said Mr Roode, 64, who has been operating a lift at the Medical Centre for 16 years.

'I felt sad because I am used to this place. And today it felt very strange to ride up in the new lifts.

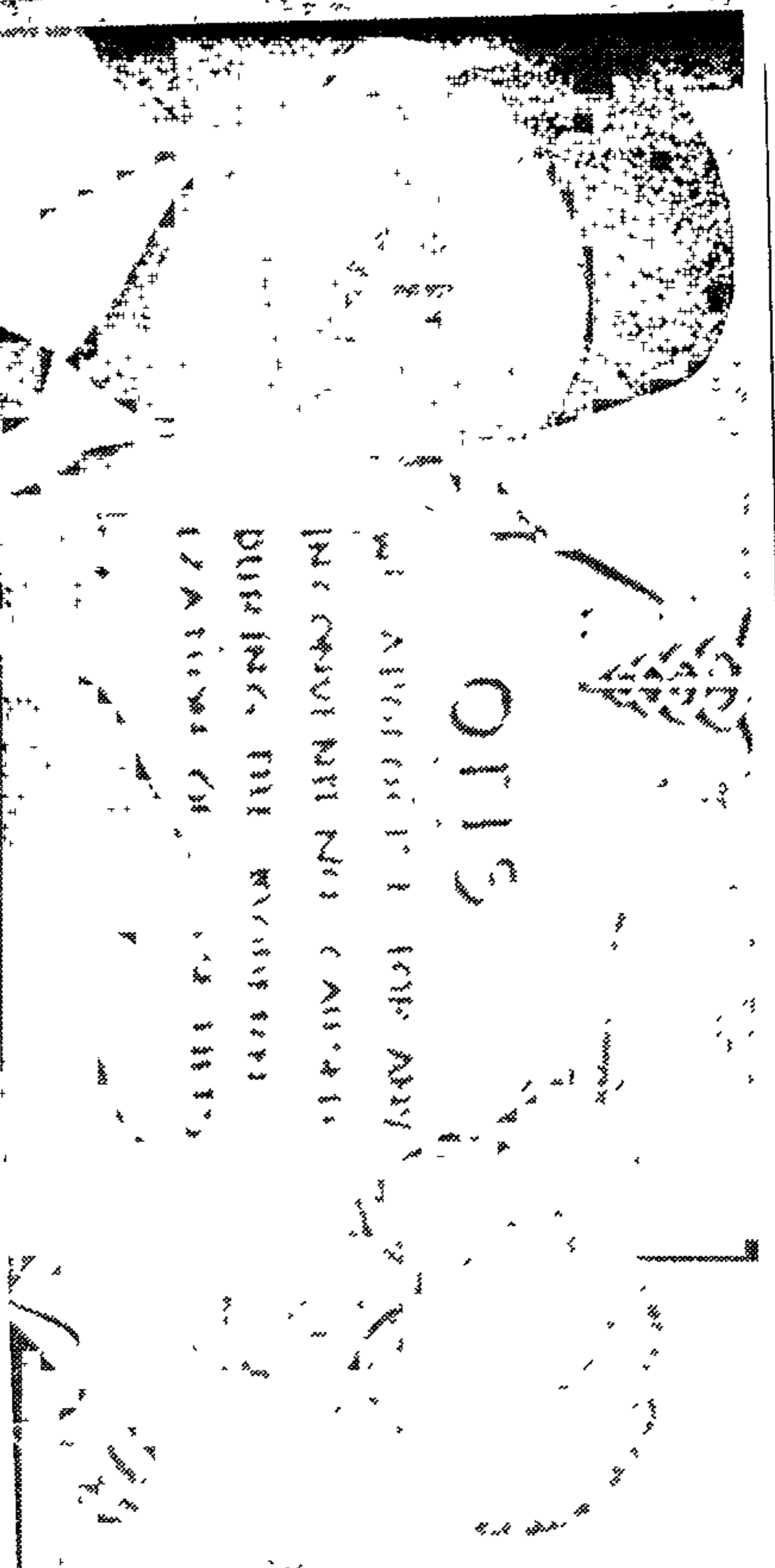
#### SECURITY

When the men were told by the buildings' owners, Gordon Verhoef and Krause, that automatic lifts were to be installed, two were offered alternative jobs as security men at the front door. Mr Robertson, 63, who has been a lift attendant for 18 years, and who has heart trouble tried it for a week but found the job a strain.

Mr Roode said he was not offered an alternative job. 'I think because I have an artificial leg I would not have made a good doorman,' he said.

Mr Nardoo, 67 who has worked the lifts for 18 months, and who has arthritis, is now working as a doorman. 'I hope to do it as long as it goes

MR ARMIEN ROODE (left) and Mr George Nardoo at the lifts they have operated for years

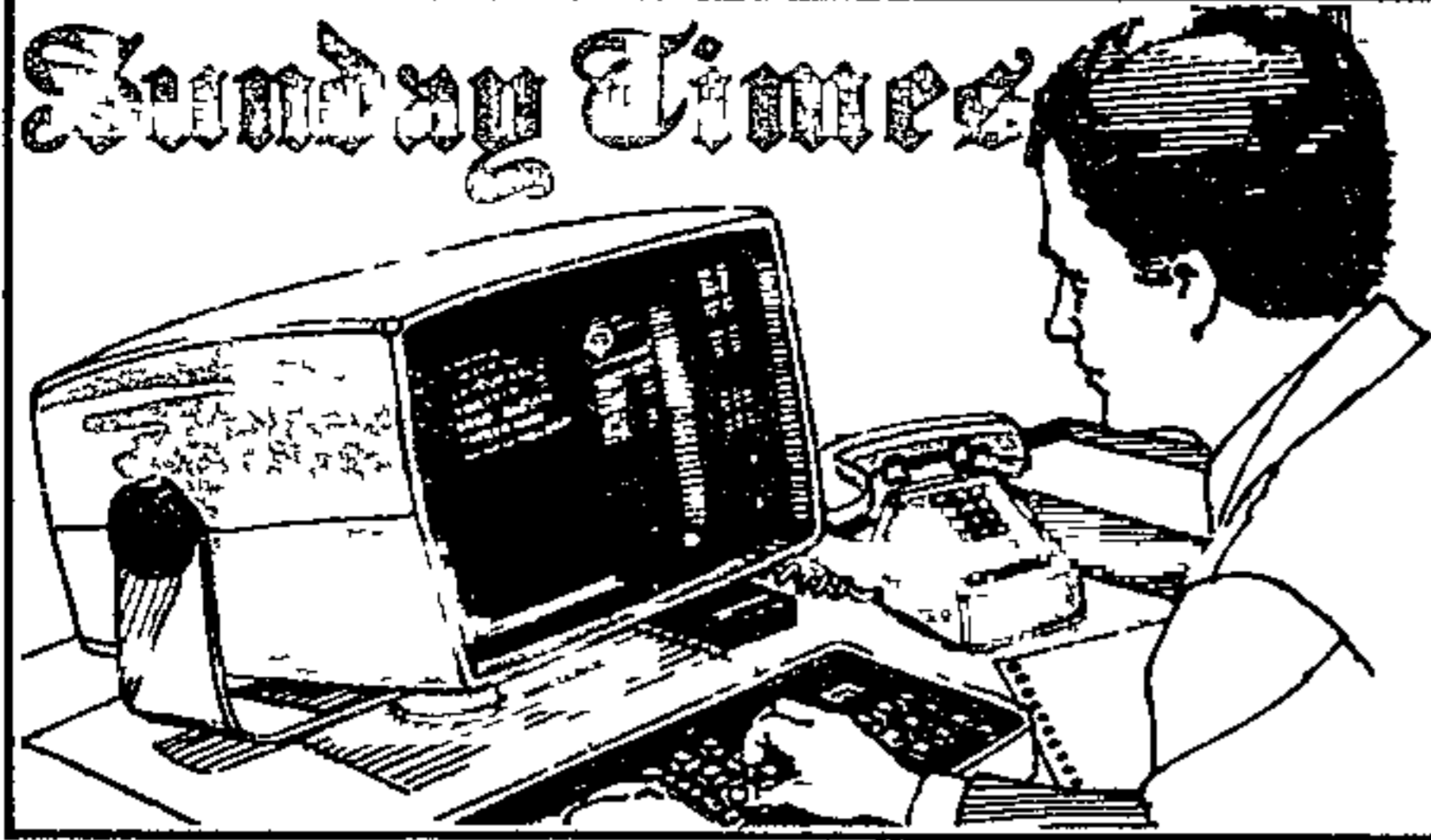


Mr Roode and Mr Robertson returned to receive a cheque from grateful doctors in the building.

'We're going to miss them,' said Dr Ivor Schulman.

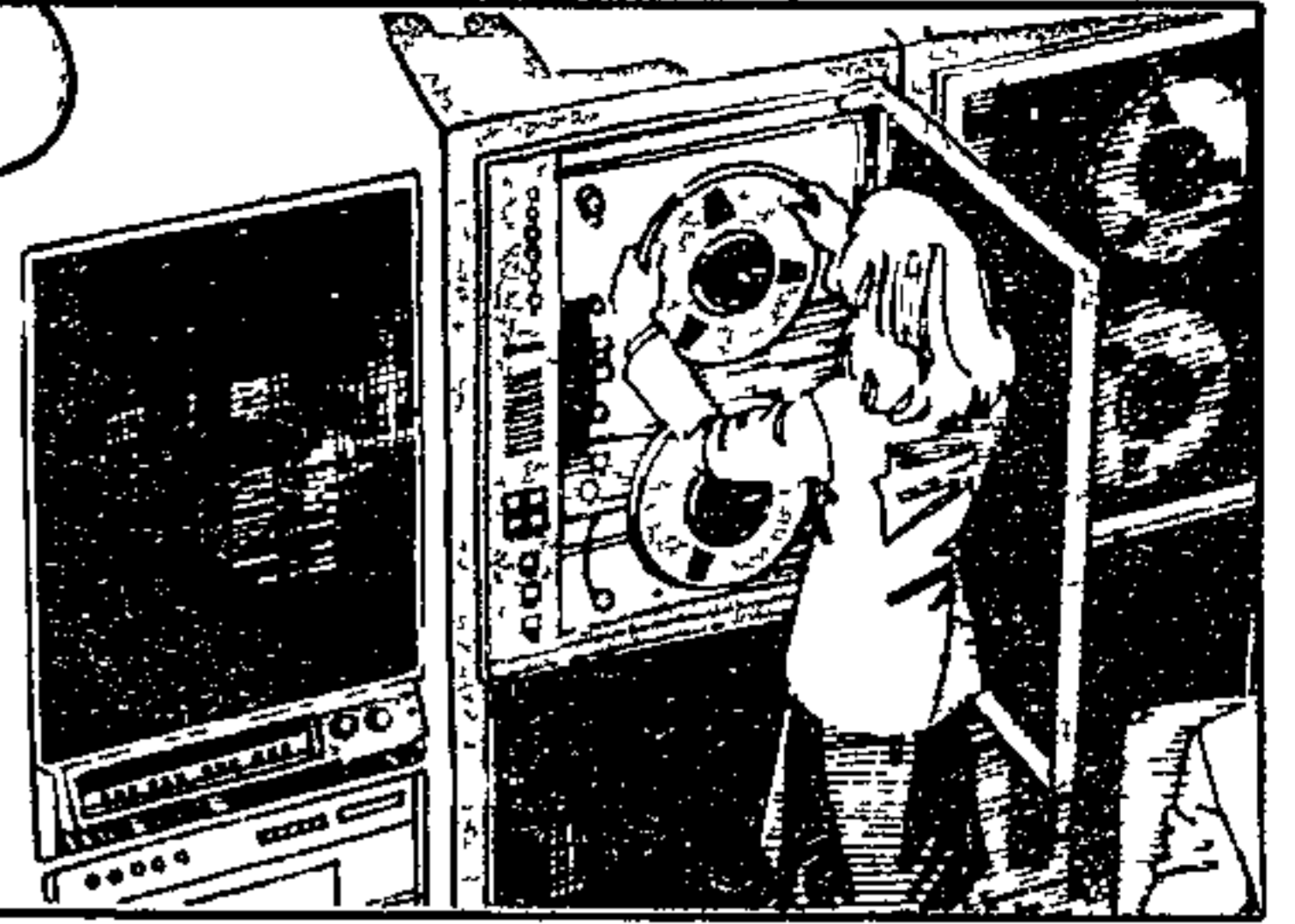
'They were kindly men who understood the needs of the patients,'





# COMPUTERS

Edited By:  
Helen Stanwix



# ICL helps industry

Sunday Times Reporter

ICL is to mount an aggressive attack on the manufacturing, engineering, construction, mining, retail, distribution and associated industries, with a new hardware/software combination product claimed to have a potential market value of R10-million during the next 18 months.

Called TRACS (Time Recording Access Control System), the product addresses the problems of attendance reporting, time keeping, and access control

It produces a formatted interface for onward processing to whichever payroll system is used by a computer

With its bureau operation, ICL Data Services, the company will be launching TRACS countrywide from their major centres before the end of June

ICL has a large installed base of computer users in the targetted industries. And ICL DS, the largest processor of payroll in South Africa, sees the TRACS system as a natural development to its customer base in these areas

In addition to offering a total solution package comprising hardware, software and installation, users also have the ability to build on factory data collection systems which can feed new or existing computer production planning systems with accurate information as and when it is generated on the factory floor

The system monitors absenteeism after the clocking-in period and provides an analysis of available labour per work centre for re-allocating resources. It also provides reports on personnel who fail to clock-out, and gives far greater control when authorising overtime

## Security

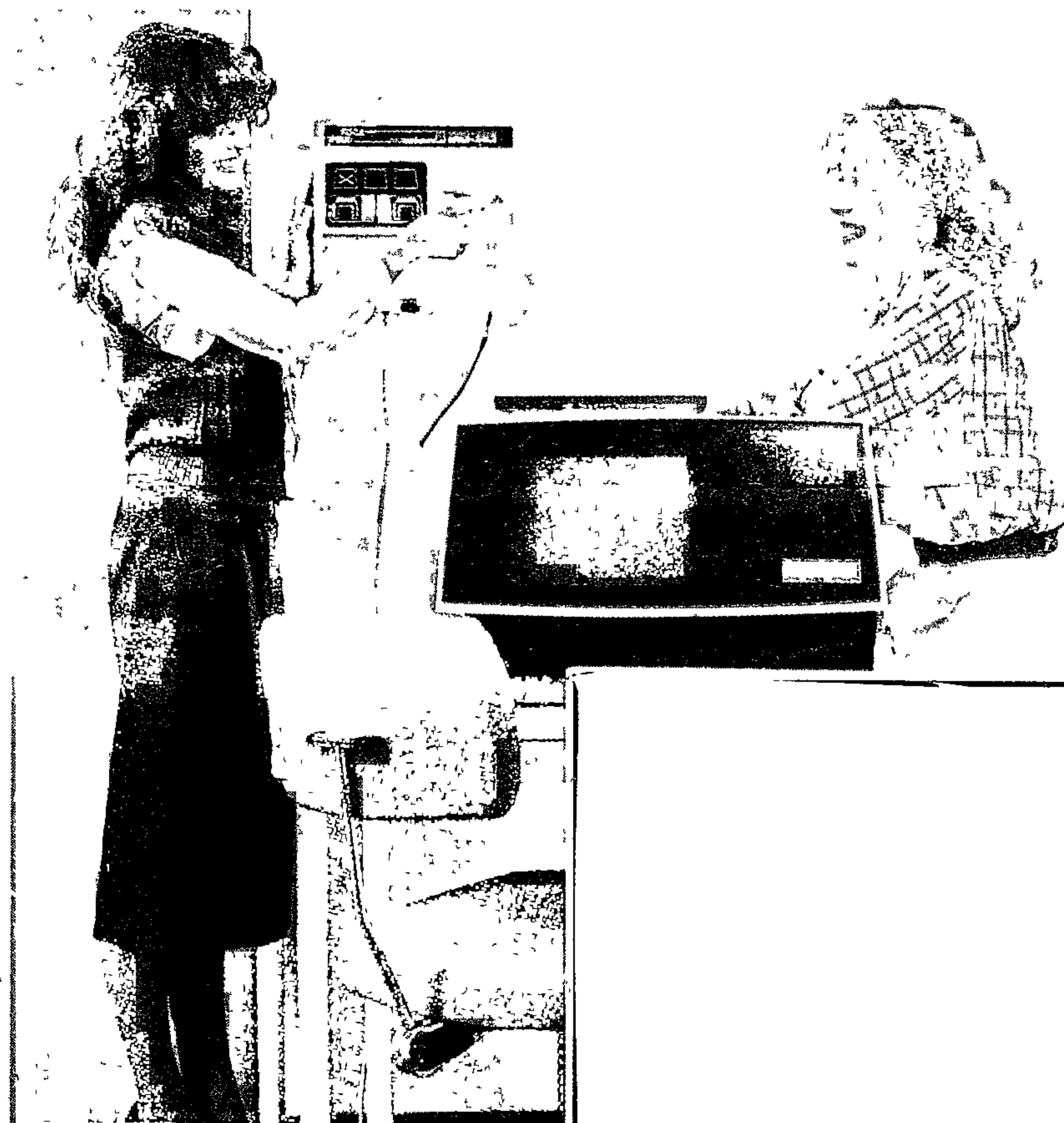
In the area of time recording, the system is used for logging of clock-in and clock-out times and the calculation of normal time and overtime for employees.

The important area of time management is addressed through synchronisation of factory clocks and hooters with the system.

In the area of access control, the system has security features which provide staff access in certain areas. Reports on unauthorised attempts to secure areas are of crucial importance and ICL feels these will be of particular value in areas such as manufacturing, construction, retail and distribution, and the mining industries.

It also provides the facility for visitor tracking with the ability to block secure areas to visitors with access to other areas.

The system also has the ability to monitor and keep track of staff and their locations, particularly in hazardous sites like mines and munitions plants, and so provide instant information



The ICL 1505 controller (foreground) which, with the TRACS software and 9606 badge reader terminal, provides unique features for a wide range of applications

on personnel in areas where accidents or disasters might occur.

A major feature is system modularity and the ability to enhance it with existing equipment for access control to pro-

vide facilities such as access turnstiles, warning lights and sound alarms.

The hardware for the system comprises a 9606 terminal designed for any application requiring clocking-in or out of personnel with a rugged construction enabling it to be sited close to any hostile work centre

The terminal continuously displays the time of day. The clocking-in or out sequence can be selected either manually on individual clocks, or automatically by the software

Through-put rates of up to 40 badges per minute are possible with each terminal. Options include 12 or 24 hour time display, station identity and badge content checks

The card reader terminal is driven by an ICL 1506 micro-processor. Terminals can be sited up to seven kilometres from the 1505

# keep tabs on staff

## Tiny chip is the biggest

A TINY new computer chip said to be the most powerful in the world was unveiled in New York recently by Hewlett-Packard scientists.

The new chip measures only 6.35mm on a side, but has 450 000 transistors built into it. This is more than twice as many transistors than any other chip according to Hewlett-Packard.

The new central processing unit (CPU) is part of a set of integrated circuits now under development, and is likely to be the heart of an advanced computer. But the company says it has no immediate plans to introduce systems using the new chip

Engineers fabricated the new 32-bit processor chip with a new high-density, high-speed N-channel MOS process.

The CPU contains 32-bit data paths and 9 000 38-bit words of micro-programmed control store that implement an extensive instruction set. It has a sequencing stack with a set of 13-bit registers that fetch the micro-instructions

The announcement was made at the International Solid-State Circuits Conference in New York.

## Foolproof finance at lower interest

WITH soaring interest rates threatening the viability of a number of computer deals currently under negotiation, one software house is offering finance to computer purchasers at an effective rate of 8% per annum

Source One Systems says its interest "holiday" stems from the British Government's efforts to assist exporters via the Export Credit Guarantee Department.

Through the ECGD South African buyers can secure finance at an effective rate of 8% on the value of the capital sum involved.

order worth more than R90 000, Source One claims to have vaulted this hurdle

It also offers the same interest terms to purchasers of the different software packages it imports from the UK.

And, on the basis of hardware and software sales financed by the ECGD the company expects to write up R3-million worth of business this year.

Source One's managing director, Dave Johnson, notes "In the past, the scheme has been used in the computer industry mainly to finance larger packages such as the purchase of mainframes

"What has tended to restrict the ECGD scheme applying in the field of smaller computers has been the stipulation that exports had to be in excess of £50 000 (R90 000) "

But by "pooling" purchasers and feeding through a single

An arrangement with one of the leading commercial banks to use its overseas lines of credit will enable Source One clients to achieve even greater interest savings through buying forward cover

Buying forward cover a year in advance, either via rand-dollar-sterling or rand-sterling, can currently attract a discount of a further 2%, which brings the effective rate of interest on equipment finance down to the region of 6%

Typical cost of a TRACS system comprising four 9606 attendance terminals, the 1505 disc-based controller, a fast printer and the software is around R40 000. The system can be linked to ICL, IBM and mainframes from most other suppliers

Set up time is a few days using standard software. Additional user routines can be easily added and the user can tailor the output and format of his reports to suit his own specific requirements through software called Generex 80



# SANLAM SLASHES TYPING COSTS

TYPING costs at Sanlam have been slashed by 50 percent after the gradual introduction of electronic text processing (ETP) in the typing pool.

ETP has now been almost entirely installed with a very favourable effect on productivity. The staff — without being increased — can now handle twice the volume of work, says Mr Fame Marais, manager of work study.

Mr Marais says benefits also arise from better quality, shorter cycle periods and time saving on proof-reading.

The changes have led to a better work environment, more job satisfaction and enrichment for the staff.

● For his research into ETP in large South African life-assurance companies, Mr Marais will receive a PhD at the University of Cape Town today.



# Office automation hang-ups

OFFICE productivity has increased by only 0,5% in South Africa during the past decade — and much of the blame can be put on an alarming lack of knowledge of automated office systems, Eddie Nicholson, behavioural sciences consultant with the P-E Consulting Group, claims.

Speaking at a seminar on office automation in Johannesburg, Mr Nicholson said that the attractive benefits of the powerful office systems now available were causing organisations to first buy expensive hardware and then try to fit it into existing administration and production systems.

"Naturally, the opposite should be done. The result is confusion and financial losses. Office-worker productivity in South Africa has, in fact, increased by a disappointing 0,5% a year during the past 10 years.

"Until office managers learn that they must first evaluate hardware requirements and the techniques associated with the systems, these productivity problems will remain," Mr Nicholson warned.

By Jan de Beer

He said that the powerful new automated systems now available to offices had also given rise to new anxieties and tensions within the organisation.

"Middle managers are often concerned about retraining, of becoming obsolete, of not being able to understand the technol-

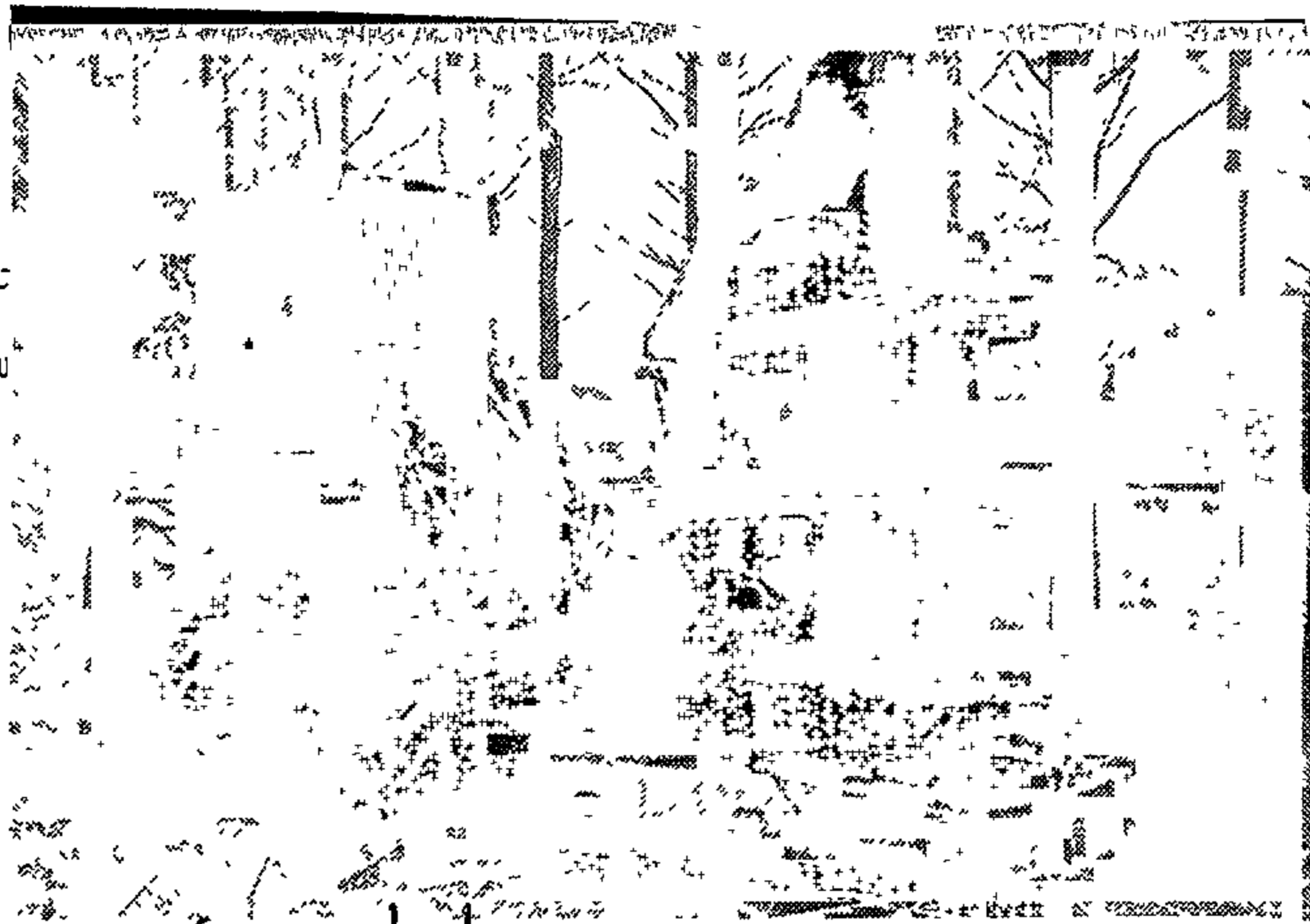
ogy — and of a possible personal loss of status."

Mr Nicholson suggested that companies could overcome such automation problems by appointing one person to evaluate all office and administration systems and to identify problem areas.

"This person should also be responsible for hardware purchase decisions and implementation strategy," he added.



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S. Times 29/3/81  
**Cutting down on sweat**

By Vera Beljakova

A SPECIALISED felling and bunching machine, introduced by Barlow's Tractor Division, is expected to take the sweat out of tree-felling and make a significant impact on the local timber industry.

The first Fleco feller-buncher on the local market, mounted on a Caterpillar 930 front-end loader, has successfully completed a three-month trial run at Sappi Forest's Karkloof plantation near Howick.

The Fleco-Caterpillar combination is part of the new direction in the timber industry. It not only increases cutting capacity but, because it can do its own bunching, eliminates the need to employ extra choker men (setters).

The unit averages 36 cubic metres of timber an hour and is designed to work in tough, hilly terrain coping with slopes of up to 14 degrees. It also works in rough undergrowth, cutting both softwood and hardwood, leaving a markedly reduced stump height, which results in considerably more wood volume harvested per tree.

less per head  
 R5 or less.  
 that 95  
 more than

TABLE 22  
 Distribution of families according to income per head, weekly R

Income (R per week)	Number of families	Cumulative %
0 - 1,00	0	6,92
1,01 - 2,00	9	32,31
2,01 - 3,00	33	60,00
3,01 - 4,00	36	73,08
4,01 - 5,00	17	79,23
5,01 - 6,00	8	81,54
6,01 - 7,00	3	86,15
7,01 - 8,00	6	89,23
8,01 - 9,00	4	90,00
9,01 - 10,00	1	100,00
> 10,00	13	
<b>total</b>	<b>130</b>	

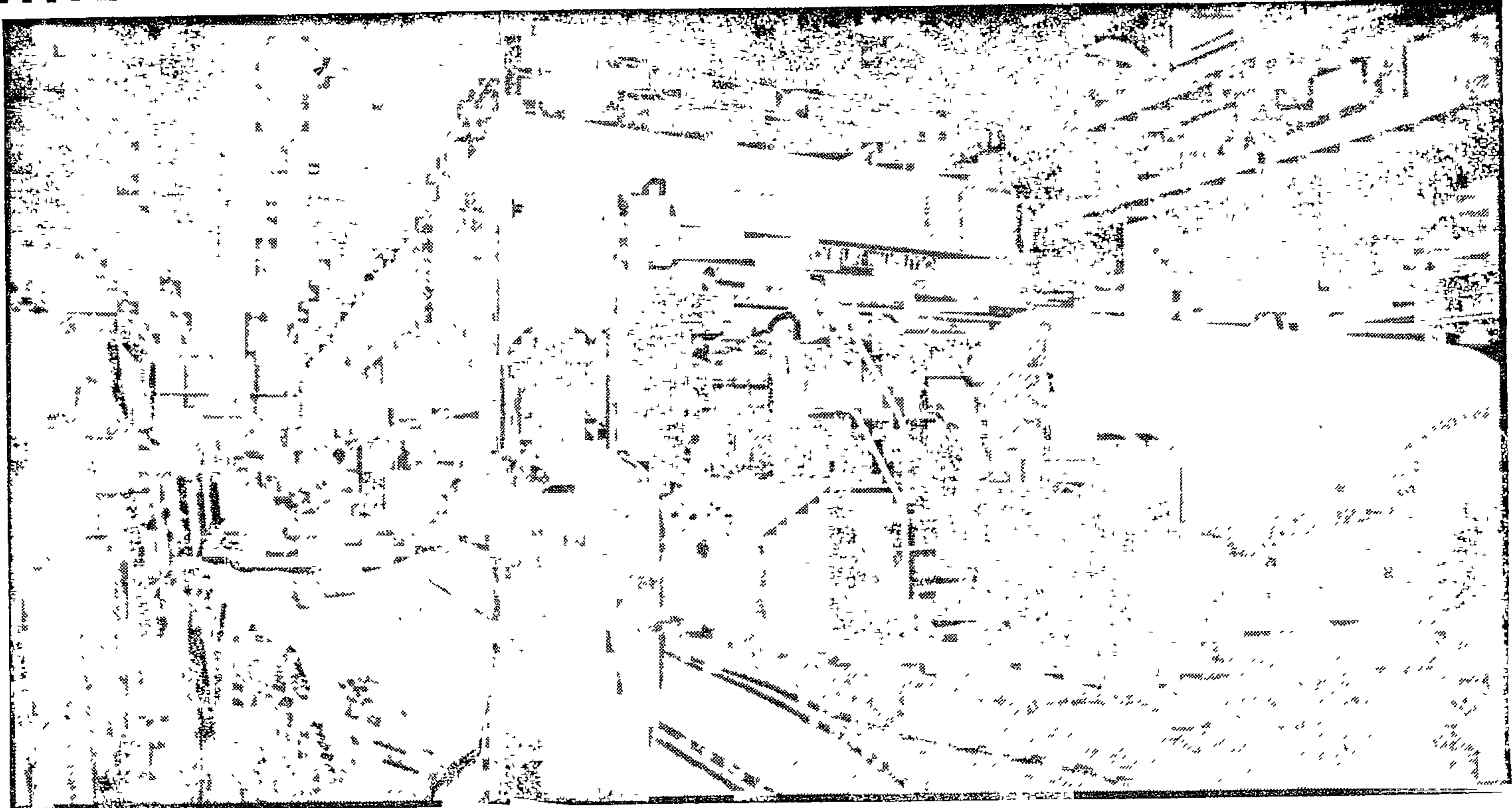


**THE COMPUTER REVOLUTION IS SHOOTING US INTO AN ERA WHERE MANY JOBS WILL BE DUMPED IN THE SCRAPBIN OF HISTORY.**

# THE CHIPS ARE DOWN!

*S. Tribune 9/8/87 (179A)*

**... AND THE BRAVE NEW WORLD COULD CATCH US NAPPING**



ONE man and two assistants operate this machine producing 800 metres of newsprint a minute. The computer makes split-second judgments too fine for a human being to make and tells the operator which button to push



THE computer revolution is shooting us stony-eyed into an era where many of the jobs we take for granted will be dumped in the scrapbin of history.

Typists, bank tellers, accountants and their clerks, store men, packers, printers and supermarket workers are among the more visibly threatened occupations, but in the long run none of us will be left unaffected.

If you ever wished you were born in an age when the world was set spinning by an invention like the wheel or the steam engine, then look no further but look a lot harder — you're in it and already revolution bound.

Whether it will bring fruits more of sorrow or delight is the subject of hot dispute in the countries where the new wheel — the silicon chip — was developed.

South Africa has led on the chip but men to pick up on the job. A quick ring-ding-dong suggested that the Government and the trades unions are girding their loins to face a brave new world.

A senior official with the Government's Manpower 2000 programme put it: "We are aware of the problems of the new technology as critical — but we haven't got round to looking at them yet because of a shortage of personnel."

As for journalists, a dip into the newspaper cuttings files — themselves soon to be a thing of the past, along with the typewriter I am hammering out this story on and the machine on which it will be printed — reveals a predictable stream of jokey headlines and typographical gasps of appreciation for each new wonder of the new age, but few of the much-needed notes of caution.

So here's a plunge into complicated and troubled waters.

But first the chip.

## Cheap

The new technology has enabled computers, which were once costly and occupied whole buildings, to be etched on to small "chips" of silicon — some smaller than a matchhead — for as little as one rand apiece. Because chips are minute and cheap, and getting smaller and cheaper, they are rapidly replacing more costly mechanical, electro-mechanical as well as human functions.

Each day brings new applications, the most immediately visible being the proliferation of cheap watches and calculators.

In Britain and other Western countries sober people believe that many children now going through school will never work and often what has

By

**ANTHONY SWIFT**

been dramatised as the recalcitrant actions of workers have in fact been vain attempts to hang on to their jobs.

In a recent film on the automation of a glass factory, displaced workers whose grandfathers had worked for the same company were interviewed.

"We thought this place was some'at to do with us," they told the interviewer. Inside the factory a vast machine produced an endless ribbon of glass "untouched by human hand."

On car and other assembly lines robots — mechanical arms with wrists and elbows and a welding device or a clamp at the end — are clearly displacing human beings.

Their actions are regulated by silicon chips and they come complete with sensors that enable them to make precise adjustments to variations in the production line. They are programmed by a person simply taking them once through the actions desired of them.

South Africa has yet to see a large scale invasion of robotics — labour is still cheap and many of our markets are too small to justify the outlay were the arguments advanced. However labour grows daily more expensive and "troublesome" while automation grows cheaper.

Mr A J van der Watt of the SA Society of Boiler Makers, after a visit to the states, agrees. "South Africa definitely has to wake up. Here it is only beginning to affect our people in the areas of welding and machine tooling. But it's just a question of time before we will face the same problems."

Reasons for the apparent union inertia may be that, due to the desperate shortage of skilled labour and the fact that highly skilled labour is needed to install automation, white workers do not yet perceive their jobs to be threatened. Also automation is tending to take place in newly installed plants rather than old — it is filling the skilled labour gap at this stage rather than ousting workers.

Again in the early stages the operator is often needed to programme the new machine so in the first instance his job becomes more interesting and novel.

"He must teach it all he knows before it can

make him redundant." I was told wryly. Already a system that makes computers self-programming has been announced.

For their part, black unions are too embroiled in the more basic battles for recognition and reasonable pay to give more than a glance into the future. A threat of the new technology is that it will sweep over them before they find their strength as the opposing costs of labour and automation reach a break-even point.

The cheapening of computers has a good way to run. At the present state of the art circuits with one million transistors can be etched on to a chip one centimeter square — with about 650 being needed to codify the contents of a novel. It is thought that circuits of up to 25 million transistors may be possible before the limits of physics are reached.

## Affecting jobs

Already production automation now being installed in South Africa is arguably affecting the number of jobs that will come on to the market in future as well as setting a pace that older operations will have to try to match.

According to one source South Africa came fourth in a survey comparing the take-up of computers with the GNP of different countries.

Already there are totally or largely automated plants producing glass, aluminium foil, paper and now newspapers — and, no doubt, many other things. Anyone who wants to look into the future should visit one of them.

At Monday in Durban three people and a computer run a machine — one of several — which produce 800 metres of newsprint a minute. Another three men and a computer control machinery that wraps, labels and issues the sales and shipping papers for 2500 reels of newsprint of varying sizes. . . wait for it . . . in a day, one every 35 seconds.

"Paper making," I was told, "is a capital intensive industry. You simply can't do it labour intensively, even in the packaging section. People just couldn't shift rolls that fast and would require much more floor space."

But what decides in the long run whether an industry becomes capital as opposed to labour



and the endless quest for the owners of capital for more efficient and cheaper means of production in the face of inflation and the ever-increasing attempt by employees for an increased share in wealth

Another thrust of the new technology likely to remove familiar occupations is the ability it gives machines to diagnose, indicate and temporarily reroute around their faulty parts. Coupled with cheapness, this enables a few semi-skilled people to maintain complex equipment which formerly required highly-trained electricians and mechanics. The new maintenance man merely watches for warning lights telling him that a modular part needs to be replaced.

## Inroads

In huge automated factories you see a handful of people watching computer boards and changing parts

But the greatest inroads of the new technology in South Africa are in banking and information.

International computer consultant, South Africa-born Dr David Potter, who is here to promote the use of computers in the class-room, said: "I am convinced that the scale of the revolution hasn't yet begun to impinge on people's minds.

"In information we are talking about an event on the scale of the industrial revolution. In sophisticated economies, one in two people in office and commercial management work mainly with information. These people are bound to be affected. All of us will be affected at least to the extent that our environment will change. Micro-processors will become as familiar as Xerox machines are now."

One harbinger of change is the bar charts already appearing innocently on supermarket goods. They are designed to be read by a sensor linked to a centralised computer at a chain's head office. Point of sales staff wielding the sensor will automatically record the date of the sale, the sale, the flow of



**Buttonholed — the force that is changing our lives — a computer smaller than a match head**

customers, amend the stock records, order replacement of stock and issue a receipt

Just one implication is that management will be able to change the price of an item throughout the group by typing a simple instruction into the central computer changing the value of the price bar.

Those who laboriously stamp prices on items will go

In the field of banking the Electronic Fund Transfer system means that tellers are and will increasingly be replaced by terminals again linked to a central computer and situated in shopping centres and at points where people need money.

NBS cash-card manager Brian Ness-Harvey told me: "Among the gains of our new computersided system are automatic payments

of insurance Payments are recorded on a tape and transmitted to the building society data bureau and then on to the insurance companies. Clerks could have done the work but it would have been very laborious, need a lot more office space and people and generate a lot more paper

"Similarly firms on computer can now pay their staff's salaries automatically into their accounts cutting out a whole lot of clerical operations.

"Labour is very costly and also needs more space which is also costly and limited. The new techniques convert expensive space into inexpensive space. Our Automatic Telling Machines (ATM) put the queues outside on to the pavement.

"ATM's would definitely

be a growing function of building societies

"With rising labour costs I can't see the societies staying labour intensive as they are now — it costs a lot to keep all the little girls behind the telling desks"

Mr Ness-Harvey said he couldn't exactly say what the savings to the societies would be

"We do envisage staff savings in the future we won't have to employ people in our expansion programme to the same extent and we can switch present staff displaced from one job to something more profitable, like securing investments.

"Computers do terrify people so we've been careful to give great assurance to our staff that the new system doesn't mean they will lose employment with us"

Similar assurances have been given to printing workers by the company printing this newspaper. But Linotype operators and readers still feel threatened by the imminent introduction of automation which will allow journalists to type copy directly into a computer which will control the setting of the type and the printing.

"We're terrified," people in the works told me. "We have no individual written guarantees just a general assurance that no one will be retrenched because of the new technology."

Word processors are not only taking over traditional printing skills they are revolutionising offices and threatening in the longrun to displace typists.

Processors eradicate an enormous amount of duplication and time wasted in corrections and retyping. A letter typed on a computer keyboard appears on a television-type screen and allows for alterations to any part of the letter without having to retype the whole thing, before a final print-out is secured at the touch of a button.

Documents can be filed in the computer memory

and recalled for amendments or updatings Documents can even be transferred from terminal to terminal obviating the need to send them through the post, with enormous implications for postage and transport

When he took over as Natal area manager for Wilmont Computers, Chris Taylor threw out the typewriter and installed a word processor. His secretary, who used to do mainly typing, answering the phone and "reading novels", now in addition to her secretarial work sends out all the branches invoices and chases up bad debts — something that wasn't done before

"She brings money back to the firm more quickly, and her work has been diversified and upgraded," he said.

From his perspective, like many users and purveyors of computers, he is convinced that computers will free people from boring tasks and enable them to be more effective rather than redundant

The theory is that this release of energies will produce growth which will absorb people displaced.

## Optimism

Dr Potter believes this attitude reflects more the "optimism that can occur at the end of a lovely boom" than what is likely to happen

"Would they have expressed the same optimism two years ago? Will they four years from now?"

"There is undoubtedly an unemployment problem though at first it is likely to be one of redeployment"

In manufacturing, jobs are being lost overseas now and there will be redundancy and long spells of unemployment, particularly for those too poorly educated to be retrained or too old to adapt to the rapid changes ahead"

For South Africa, with its lack of social welfare, its traditional attitudes to labour and its ranks of unemployed, unskilled and uneducated workers coming on to the jobs market at a rate of about



9 August 1981  
Sunday Tribune

optimism

250 000 a year, the new technology poses special challenges.

Our swing to automation is probably reflected in the small growth in non agricultural jobs for blacks in the last two years of expansion.

To crystalball gazers into the rapidly rising future, the new technology appears to offer two broad options — a new era of release from drudgery, and

liberation of creative energies or one of growing bondage to the powerful, growing unemployment and disinclination from the world's wealth — 1984 coming in just about on time.

What will determine it will be the degree of alertness as well as the attitudes and actions of the owners of the world's wealth, governments and us, the people. It's a subject that should concern us all.



# Drawbacks won't stop modernisation

179A  
S. Express  
31/5/81

**DESPITE many drawbacks, South Africa will increase and modernise its technology, says Professor Gideon Jacobs, principal of the University of the Witwatersrand Graduate Business School.**

In a commanding survey of impending technological change and its effects on manpower utilisation, delivered to the National Congress for Manpower Utilisation, Professor Jacobs defined some of the main pressures

- The country is among the technologically backward countries when compared with the USA, Japan or Europe and has considerable leeway to make up (55 man-hours to produce one vehicle in SA 25 hours in Europe).

- Labour problems — including escalating wages and salaries and artificial obstacles to the employment of Black labour — which continue to influence entrepreneurs to prefer machines to men

- Our productivity is well below that of other Western countries, a state of affairs that can only be remedied by a combination of technological advance and the better deployment and use of a better-trained labour force

Improved productivity accounts for about 70% of economic growth in the West in SA it accounts for about 30%

In a comparison of the average value of goods produced per capita (GNP over labour force) in a number of industrialised countries, South Africa is at the bottom of the poll

West Germany ...	\$.26 793
USA .....	\$.25 566
France .....	\$.22 446
Australia .....	\$.16 995
UK .....	\$.12 402
Italy . . . . .	\$.12 164
SA .....	\$.4 221

Our labour participation rate (ie our economically active population) at 41% is only slightly lower than the figure for developed countries

The solution therefore lies in using labour better, which means, among other things, training them better before they are placed in employment. Training over the next two

decades will be influenced by the need for increased numbers to meet increased demand and a change in content to meet the requirements of new technology

An added problem as far as South Africa is concerned is that the undeveloped, unskilled sector of our population cannot simply be trained to use technology

For a great number of people the whole way of life, customs, values, habits of thought, ties of kindred and notions of obligation, authority, time and punctuality have to change if they are to serve the needs of a sophisticated economy using advanced technology

And even if the content is geared to vocational purposes, needs are so varied that gaps are impossible to assess and it will fall on employers to fill them. This could mean that in-training schemes will include more general education which will pose problems in terms of the availability of suitable instructors

Obsolescence among employees will increase in the 1990s, especially in the professional/specialist and managerial categories. Much of the impetus towards retraining will come from the employee, simply as a matter of survival

But in many instances the location of resources and facilities will often be beyond the individual's scope which once more places increasing responsibilities on the employer

Other developments may be

- The extended use of matrix organisations for managing complex development projects

- Greater reliance on small groups for manufacturing and assembling intricate equipment which will mean more attention to the selection of compatible individuals

- Greater emphasis on human relations skills in the general management function in the Nineties

This will be the result of dealing with more sophisticated and highly educated groups of employees who will make greater demands in respect of personnel management techniques such as motivation ne-

gotiation, performance appraisal and so on

Formal training will be more prominent, thus higher initial qualifications will be required, followed by the mastery of a much wider range of knowledge

The numbers involved and the variety of training deranded will lead to more substantial training facilities in terms of numbers employed and level of instruction expertise. This means that investment, that is, money invested, in training and development must increase and will certainly rise further in the years ahead

Western technology as we know it developed in countries with well-trained labour and we cannot have the one without the other

What we do not want to do is to imitate blindly or go for capital intensity just because the head office in Texas or Germany insists on it because it works there

We have the crucial problems of raising efficiency and productivity while at the same time keeping a weather-eye on the pending unemployment storm. We must therefore aim to develop the right mix of appropriate technology and labour use to suit our circumstances and problems

Even labour-intensive systems are not always simple and do not exclude the use of some technology but it should be appropriate. Appropriate technology has been described as "technology which in the economic, social and other conditions under which it is applied gives the greatest contribution to development objectives"

Thus though "small" may not always be the ideal, and certainly is often inappropriate, the small business has significant value in certain circumstances

Neither is "big" necessarily all bad. Expansion in the high technology industries in the US has led to the establishment of thousands of new small industries doing sub-contract work for the gargantuan multinationals

Japan saw the need for the sub-contractor and chose South Korea, Taiwan and Hong Kong

as suppliers — the latter has 35 000 small industries, which account for 18% of its GDP

The technology applied in each case should therefore be neither capital nor labour-orientated, but research-intensive, technology based on the availability of certain resources, labour and capital

We should begin to think "South African" in the capital investment market, to use South African-made machines better designed and adapted to our problems. Much discarded technology may be improved for efficient operation in labour-intensive situations, for example, and in general it would be well worth our while to encourage the establishment of an Appropriate Technology Research Institute and encourage trade unions to debate the question of long-term technological policy

More and better education — and in the nature of things, it will be predominantly directed towards the Black labour force — is a prerequisite to more advanced technology. We must also adopt an informed attitude to increasingly sophisticated job fragmentation as an aid to easing the unemployment problem

We must encourage all forms of entrepreneurship

It has been suggested that Government regulations in regard to minimum standards restricts experimentation and the use of alternative methods

Any restriction on entrepreneurial activity such as still applies to Black, Coloureds and Asians also discourages the application of technology, however simple, and the extra employment of people. These too, where they still exist, must go in their entirety. What is required is to extend the range of choices and to allow a wider range of standards and market patterns to co-exist

A certain amount of planning even in a free enterprise economy is inevitable, even if it is only to plan to remove restricting rules and regulations. So let us aim to ask the right questions and work to find the true answers

Above all, let us increasingly ensure a healthy exchange of views between those who propose investing in technology and those who work it and must use it and apply it.



MAN POWER — TECHNOLOGICAL CHANGE

1982 ; 1983, — 1984 — : r P ;



# Mechanisation will chop costs

179A  
Industrial Week  
2/3/83

By Howard Cary

WE must continuously improve the quality and reduce the cost of weldments

A major factor is to improve the operator factor or duty cycle

This is best done by replacing manual welding with mechanised welding

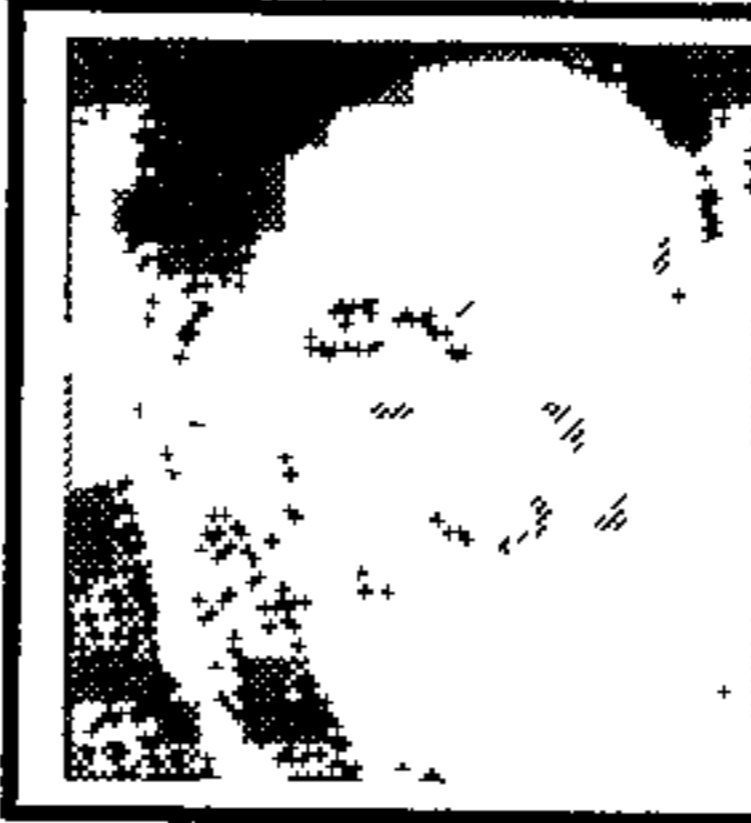
The programming of welding schedules and the pulsing of welding power sources has made mechanised welding a practical shop tool

For it can be used on repetitive jobs using mechanised orbital tube and pipe heads

It can also use a new universal type machine

that can accommodate many different types of jobs

the high volume in industries such as the automotive because



Howard Cary is the vice president -welding systems at Hobart Brothers, US. He is one of the guest speakers at the "Welding and the engineer - the challenge of the '80s" conference

Automatic welding has greatly increased productivity, but it is restricted to

of the high cost of the equipment

Robotic arc welding

seems to be the answer

It has a very high operator factor and can be reprogrammed often for different jobs

In the last few years it has found increasing use in many industries

Precisely placed welds made with the new method are superior to those made manually

It is also used to salvage heretofore scrapped parts, giving very definite savings

Computer controlled arc welding equipment is now available

It is used where numerous variables must be changed simultaneously

Computers are also being used to programme equipment to make complex welds

For it reduces the physical fatigue involved with manual welding

A new method of welding aluminium is being used which improves quality and reduces distortion without requiring excessive surface cleaning

A word which has recently entered the welding vocabulary is synergic welding

This is a new way of improving the quality of weld appearance Spatter is almost entirely eliminated

It relates the speed of electrode wire to the pulsing frequency -of the power source giving better metal transfer across the arc

# World in midst of 'revolution'

23/2/83

SA

179A

By Hugh Poulter

Industrial week

THE world is in the midst of an industrial revolution, with Western countries turning to high technology industries and moving away from labour-intensive heavy industries, according to Peter Morum, MD of Firestone SA

But this move from "smokestack" blue collar industries in the West towards service and electronic industries, leaves a big gap in the total economic picture and SA should be in the forefront of countries capable of filling this gap

"We have the required ingredients in the form of labour, capital and the

necessary raw materials" said Morum speaking at the Plastics and Rubber

**Peter Morum . . . must invest in the future.**

Institute's third Foundation lecture recently

"I believe we must

have the courage and the foresight to invest in the future, supply the needs of a market which is moving towards us and, at the same time, provide much needed employment for the developing population of our country"

He said that by grasping this opportunity, "We can help SA become a dynamic force in the structural change taking place in the economies of the world"

Morum added that the revolution began when Opec raised the oil price in 1973, and was the result of the desperate

search for alternatives to petroleum products, the high cost of labour in Western countries, the availability of cheap and intelligent labour in the East and the additional costs faced by established industries in fighting pollution

"Suddenly less use was being made of heavy materials such as steel, iron, glass, rubber and zinc, and a demand arose for plastic, aluminium and high strength steel", said Morum

"We have the basic equipment, the labour and the finance to get a good share of the market in the face of Far Eastern competition. Our vital need in SA is to provide employment and if we are not competitive we are not going to survive"

Morum said one of the biggest issues facing SA is the question of pay rates and the continuing pressure exerted by the labour unions

"One hears talk regarding the need for unions to continually press for wages to be equivalent of those of Europe. If this is really the objective then we can have no industry in our country without protection. If we need to do this then we will ultimately not survive"







# FACE OF WEST RAND SET TO CHANGE DRAMATICALLY

NEARLY a third of the people employed in the gold mining industry on the West Rand will lose their jobs by the turn of the century — only 18 years away.

And in 40 years' time only five of the West Rand's 11 gold mines will still be operating.

Experts predict that about 137 000 people now employed in the mining industry in the region will lose their jobs by the year 2000. By then the area will be mined out and the mines closed.

Many of those who earn their living in mining are likely to be employed in industries which will spring up in the wake of the decline of the mines.

A strategy for the future conference in Carletonville this week, mining experts explained how West Rand towns would have to provide alternatives to gold mining if they are to survive into the next century.

The warning was levelled mainly at Carletonville, Westonaria and Koshville — although all towns on the West Rand will be affected to some extent by the decline in the mining industry.

Any decrease in mining activities will detrimentally affect all economic activities in the area unless an alternative economic base can be devised, said Mr John Kusinadin, engineer and member of the Transvaal Township Committee.

"When the mines start closing down it is probable that this will coincide with the replacement of the mining village by large-scale industrial development."

Professor Fritz Pogreuer, director of the Institute for Regional Planning at Potchefstroom University, said the firm was not to plan for the 1990s will see a sharp decline in mining activity.

At present, 13 000 whites are employed by the industry. The 1990s will see a sharp decline in mining activity.

# Third of workers in gold mining will lose their jobs

By Peter van der Merwe

When mining shrinks, alternative industries and activities must be phased in when mining begins to diminish. In the way the population will be as a result of a long-term "burn" for them selves and their children.

He said it was essential for the mining companies to diversify the interests to ensure that they had a viable play in which their investment would be profitable. More that 100 alternative industries were offered on the West Rand directly and indirectly related to the mining industry and some of these areas are involved in the industry.

By the turn of the century there will be a sharp decline in mining activity. The 1990s will see a sharp decline in mining activity.

Most of the people employed on the mines by the end of the century will still be migrant workers, said Mr Peter Janisch, general manager of gold operations for Gold Fields South Africa.

With the total population of South Africa, including the homelands, being projected at 40 to 50-million by 2000, there will be strong pressure for mines to continue to offer employment to all residents.

In the year ending June 1982 black gold miners spent R65-million at their

places of employment. The acting town clerk of Westonaria, Mr Jan du Preez said future industrialisation plans would be aimed at using as many of the black workers shed by the gold industry as possible.

"Their buying power is considerable, but their labour is also invaluable to new industry.

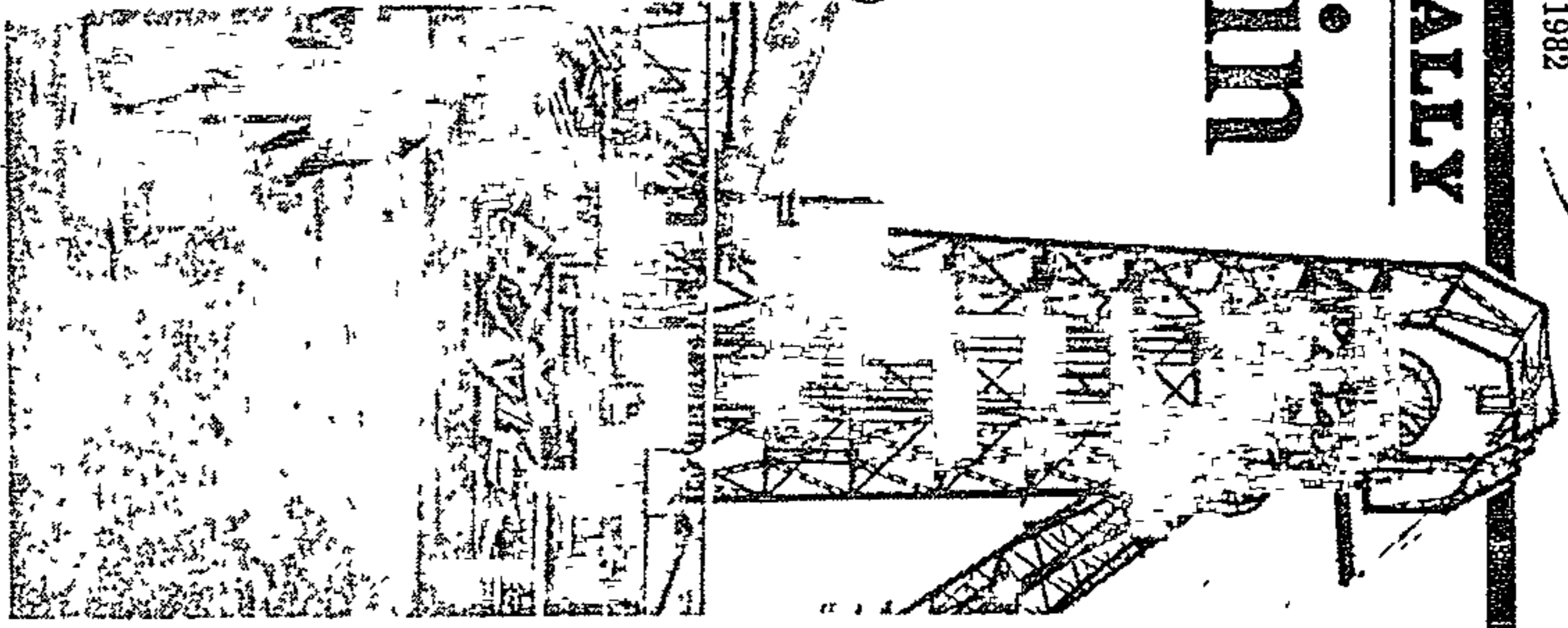
"Provision is also being made for the construction of coloured and Indian housing between Westonaria and Carletonville. Skilled workers in these groups will then be able to move in when industry becomes established."

Mr Rosmarin said careful thought should be given to the type of industries introduced to the area and the methods involved in doing this.

"Consideration should be given to the types of industrial uses that should be attracted to the area.

"It is not advisable to try to compete directly with existing industrial areas in the Pretoria/Witwatersrand areas.

"Ideally, the West Rand area could attract certain types of industries which could act as a catalyst for further growth, and also give the area a character which could become a marketing tool for promoting the area," he said.



● The mines on the West Rand employ thousands of workers, but by the year 2000 a third of them could lose their jobs. And in 40 years' time, only five of the present 11 gold mines in the region will still be operating. Experts are already looking into ways to attract industries to provide those people with alternative employment.



CAD uses a television-like display terminal to produce drawings in a fraction of the time needed to do them manually. Different views and perspectives can be obtained with a single command and small sections can be magnified for closer inspection. It also automatically calculates dimensions, stresses and masses, performs engineering analysis and generates parts lists.

CAM, on the other hand, converts design information into control information used to run automated manufacturing machines such as numerically-controlled machine tools.

CAD/CAM systems consist of specialised computer equipment (hardware) and computer programmes (software). The CAD/CAM programme can run on mainframe computers, minicomputers or bureau services. Microcomputers can be used for CAD.

A typical CAD/CAM system requires mass memory for processing and storing information, terminals or workstations, and printers and plotters for converting information stored in the computer into drawings and reports.

Suppliers claim that a CAD system enables a draughtsman to accomplish four times his normal work load.

There are more than 20 distributors selling about 30 products, mainly from the US. They include IBM, Olivetti, and Barlow Computer Aided Design (BarlowCAD). Olivetti sells the US Intergraph, and BarlowCAD the US Computervision.

Skok Systems, the only local producer of computer-aided draughting programs, which it sells with US Hewlett-Packard hardware, claims to be the market leader. Says Skok's MD David Skok, "our systems

sell because they are designed specifically for local needs'.

According to Skok about 80% of users are buying CAD systems, mainly for draughting.

Clark's breakdown of local CAD/CAM users is heavy engineering (28%), electronics (5%), mapping (2%), architecture (41%), consulting engineering (13%), construction (5%). The rest is mainly clothing.

BarlowCAD's Ron Elvin sees booming sales ahead because, he says, SA's drive for increased exports and greater local content is generating a lot of design work which lends itself to CAD techniques. In addition, many overseas designs have to be modified for local requirements.

CAD/CAM systems range in price from R36 000 for a program running on a "beefed up" micro to R750 000 for system with four workstations. Time on a bureau time can cost R3 000-R4 000/month.

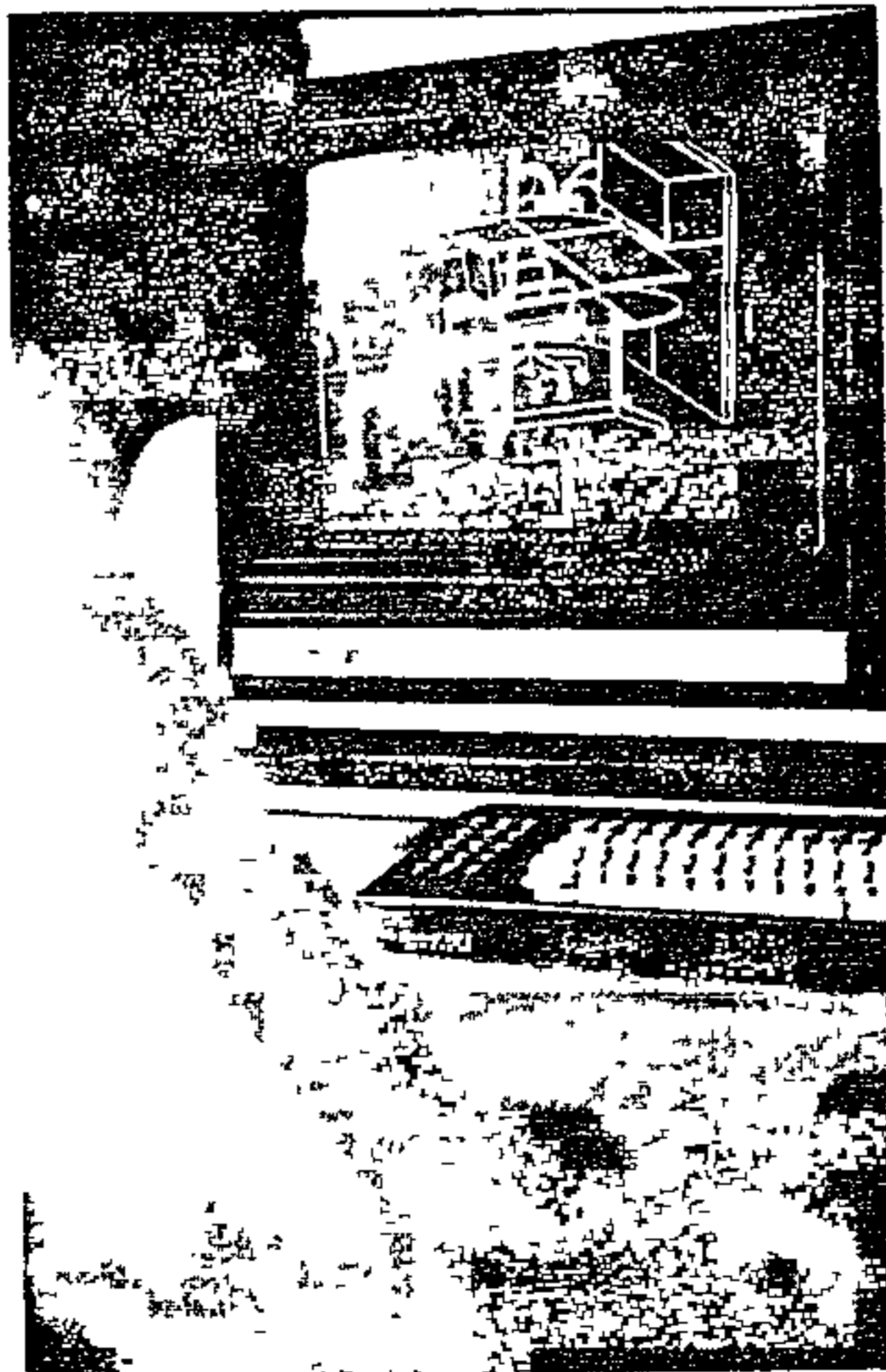
## INDUSTRIAL DESIGN

### Calling in CAD

EM 17/9/82 179 A  
More and more organisations are using computers to produce drawings and designs and to control machines which work in factories.

In the past two years they have bought about R32m worth of computer-aided design (CAD) and computer-aided manufacturing (CAM) systems. And, spurred by an expected drop in hardware prices, total sales of CAD/CAM equipment and associated software are expected to reach R100m in three years.

General Computer Consulting's Dick Clark says there are now about 120 concerns using CAD/CAM, the first was installed only late in 1980.



CAD display ... quicker than drawing



By Louis  
Beckerling

Business Editor

*E. Post*  
*28/6/82*  
Economics and not  
labour will be ~~the~~  
dominant factor ~~in~~  
in VW's decision *179A*

IS Volkswagen seriously considering re-locating its plant?

This question is currently being debated in Port Elizabeth as a consequence of the statement this week that the motor manufacturer has shelved a R100-million expansion plan at its Uitenhage plant because of the unstable labour situation in the Eastern Cape and the downturn in the economy

In the light of the continuing labour conflict most attention has, understandably, been devoted to this aspect of Volkswagen's statement, with the result that labour has tended to get it in the neck for what is simultaneously an economic issue

While Volkswagen is playing its cards pretty close to the chest, the truth is that the prospect of the company going to the expense of re-locating a plant worth several hundred million rand because of a dispute over 25c-50c an hour in wages can confidently be ruled right out of court

Economics, rather than politics, has influenced the latest decision

The question now is what decision Volkswagen will take once those economic conditions improve — and with the economies of our trading partners

**COMMENT**

now picking up and the price of gold rising this turnaround appears to be due a lot earlier than was previously expected

Will Volkswagen re-arrange corporate objectives and trim itself down to ensure profitability from a smaller market share, or will it fight along with the other manufacturers to regain the 40% market share

This is the important question, and within a matter of months it is likely to be answered a leaner, meaner motor manufacturer, with fewer ambitions and a smaller workforce, or an expansion-hungry manufacturer who will contribute to reducing Port Elizabeth's massive unemployment.

In this regard there can be no doubt that the unions hold the key. And what is significant is that the same union that is insisting on an immediate rate of R2,50 per hour for its lowest-paid members, has settled for considerably less elsewhere in the country. Understandably this has bewildered local motor manufacturers

Trading

DECISION



VW may  
bring in  
robot  
workers.

Labour Correspondent

THE managing director of Volkswagen SA, Mr Peter Searle, yesterday attacked the trade union stance in the East Cape motor industry's wage dispute and said employers might introduce robots into plants if the labour situation remained unchanged.

Volkswagen's plant has been closed for much of this week after a continuing go-slow over wage demands and further unrest had led to the closure of one Ford and one General Motors plant yesterday as workers rejected a fresh wage offer which would raise minimum pay to R2,20 an hour.

Mr Searle was speaking at a seminar organised by his company in Johannesburg.

The East Cape motor industry has been hit by continuing unrest as employers and the National Automobile and Allied Workers Union remained deadlocked on the wage dispute.

The union initially demanded a R3,50 an hour minimum, but now wants R2,50.

Mr Searle said the union's demand was "totally unrealistic relative to current wage levels, the state of the economy and the state of the businesses on whom the demands are made".

● See Page 2

September 10 1972

# Training is top priority for <sup>CAP & Times</sup> 2/8/82 clothing industry

~~178~~ ~~179~~ ~~180~~ ~~181~~ ~~182~~ ~~183~~ ~~184~~ ~~185~~ ~~186~~ ~~187~~ ~~188~~ ~~189~~ ~~190~~ ~~191~~ ~~192~~ ~~193~~ ~~194~~ ~~195~~ ~~196~~ ~~197~~ ~~198~~ ~~199~~ ~~200~~ ~~201~~ ~~202~~ ~~203~~ ~~204~~ ~~205~~ ~~206~~ ~~207~~ ~~208~~ ~~209~~ ~~210~~ ~~211~~ ~~212~~ ~~213~~ ~~214~~ ~~215~~ ~~216~~ ~~217~~ ~~218~~ ~~219~~ ~~220~~ ~~221~~ ~~222~~ ~~223~~ ~~224~~ ~~225~~ ~~226~~ ~~227~~ ~~228~~ ~~229~~ ~~230~~ ~~231~~ ~~232~~ ~~233~~ ~~234~~ ~~235~~ ~~236~~ ~~237~~ ~~238~~ ~~239~~ ~~240~~ ~~241~~ ~~242~~ ~~243~~ ~~244~~ ~~245~~ ~~246~~ ~~247~~ ~~248~~ ~~249~~ ~~250~~ ~~251~~ ~~252~~ ~~253~~ ~~254~~ ~~255~~ ~~256~~ ~~257~~ ~~258~~ ~~259~~ ~~260~~ ~~261~~ ~~262~~ ~~263~~ ~~264~~ ~~265~~ ~~266~~ ~~267~~ ~~268~~ ~~269~~ ~~270~~ ~~271~~ ~~272~~ ~~273~~ ~~274~~ ~~275~~ ~~276~~ ~~277~~ ~~278~~ ~~279~~ ~~280~~ ~~281~~ ~~282~~ ~~283~~ ~~284~~ ~~285~~ ~~286~~ ~~287~~ ~~288~~ ~~289~~ ~~290~~ ~~291~~ ~~292~~ ~~293~~ ~~294~~ ~~295~~ ~~296~~ ~~297~~ ~~298~~ ~~299~~ ~~300~~ ~~301~~ ~~302~~ 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THE clothing industry is involved in a major programme to update training and increase productivity, and is also taking a serious look at areas where the level of technology can be improved

Mr Simon Jocum, who heads up the Clothing Industry Training Board (CITB) said that the upgrading of training was at all levels of the industry, from machinists through to senior executives

The move is a direct result of a seminar held at Sun City last year when several aspects of the industry came under fire. The seminar combined the clothing and textile industries as well as prominent retailers, and was aimed at a constructive airing of their differences

Criticism of the industry came in particular from Woolworths chairman, Mr David Susman, who warned that unless the industry brought both its technology and productivity up to overseas levels, it would face a rough ride

Mr Jocum, the immediate past-president of the National Clothing Federation, concedes that "a lot of that criticism was justified"

Since the conference the industry has commissioned a number of surveys, including one through the National Productivity Institute on low-cost technology, aimed at encouraging the smaller manufacturer to update

Another survey has been undertaken on cloth utilization in the cutting room, to reduce wastage. At present fabric is over 50% of the garment cost. On the training front, moves have been made to upgrade both training in the industry's regional centres as well as in the technikons, which offer courses in production management.

Liaison with the technikon course directors has been improved to ensure that the courses meet the industries changing needs, and the CITB has arranged visits by leading overseas experts to keep the technikons abreast of new developments and trends, as well as putting a large sum towards training bursaries

Efforts are also being made to lengthen the time students spend working in factories from the present four weeks to 20 weeks

Another innovation, which has met with good response from the industry is a series of three-day seminars aimed at executives on various aspects of productivity and management.

"We have a lot of homework to do," says Jocum. "We must improve our productivity and technology in order to pay better salaries, and attract people to the industry"

In order to encourage individual firms to develop in-house training schemes, the CITB will provide training manuals, as well as advice in applying for the governments tax incentives



# Automation: Adapt or Liquidate

179A

Spaw  
29/1/82

From the Financial Times  
LONDON — At a recent presentation for financial analysts in New York, Mr. James Baker, a senior executive of General Electric of the US, asserted that managements not planning automation were "frozen like deer in the Japanese headlamps, hoping for some outside force to save them. It won't."

Personnel between them and the shop floor, while the Japanese make do with five, they are predominantly white-collar staff, says ADI's Dr. Irving Kraus, simply because present-day manufacturing consists not so much of fashioning materials as it does of manipulating information.

## ESSENCE

That, certainly, will be the essence of manufacturing to come, because use, marketable products — with short lifetimes — will become yet more complex under technology and market influences and so will be more difficult to design and make.

At one time the vision was of one large computer overlooking the whole process, from design to test, from finished goods warehouse. The advent of the small, powerful, mini-micro-computers changed all that.

## CLEVER

Several computer-aided technologies have been born, with various names that warrant some explanation. CAD, computer-aided design, in which the engineer or designer can "compose" a structure or circuit with screen and keyboard plus perhaps an electronic stylus and pad from which he can specify stored combinations of graphical or other data and put them on the screen. Until recently concerned with the routines of mechanical drafting and circuit layout, CAD is now becoming more intelligent.

clever software allows engineers to try "what if" experiments with the fundamentals of the design, numerically. The results obtained would otherwise need a series of "cut and dry" prototypes with live testing or, failing that, extensive calculations. For example, a crane job or an aircraft wing could be "loaded" until it buckled and the failure points seen on the screen. Formal blueprints vanish and all concerned always see the same thing (from virtually any angle) at the same time, on their VDUs. Then, other programmes will use the data generated to produce machine tool instructions, mould patterns and before long (flexible assembly instructions).

## ROBOTICS

● CAM, computer-aided manufacturing. Definitions vary a little, but CAM can essentially be seen as the growing alternative to fixed automation (in which a machine can only make one product). It embraces intelligent robotics and flexible manufacturing in the widest sense. Computers and sensors (visual or otherwise) combine with mechanical devices to give production units that can cope with unforeseen circumstances, ranging from a product change to (ideally) any kind of problem on the line.

## CATS, computer-aided time standards

Where manual assembly remains, as it often will for some time to come, this computerised equivalent of "the time study man" by the H B Maynard company will probably gain increasing favour.

● ATE, automatic test equipment. Brainchild of the electronics industry, where the extraordinary complexity of integrated circuit and printed board makes manual testing impossible. Big names in the ATE business are Schlumberger (embracing Fairchild and Britain's Membran), Teradyne and GenRad, bit Fluke, Gould, Hewlett Packard, Marconi Instruments, and Zehntel are all active in a market predicted to grow by researchers quest to Rg 090 within two years.

## RESEARCH

● F.M.S., flexible manufacturing systems. Development of the computer to give production machines (mainly metal removal) the ability to deal with a variety of products automatically. Still in research stage with only a handful of installations in Europe.

● CIM. The ultimate acronym? It stands for computer-integrated manufacturing and embraces all of the above. Technology exists already to link these "islands" of design, production, test, and so on.

But these factories of the future are in the laboratory at the moment. For example, at Stanford Research Institute in California, Dr David Nitzan's team linked a pair of robots with other placing devices, bowl feeders and visual systems to yield an unattended assembly station.

The linking of the separate items calls for communications over intelligent local networks, an area now under active development for both office and factory.

Advance towards the automated factory is being held up by investment in new technology and fear of change, according to Dr J N Orr, a Sperry Univac consultant. He asserts that newcomers can start with CAD, because "the unifying thread running through the whole factory is the geometric description of the product."

ATF E 15 now



TRANSPORT

# Heavies to stay in PE, says Sigma

1791A

~~1878~~

Industrial week

27/7/82

### Staff Reporter

RECENT announcements that the Sigma Motor Corporation will merge Sigma Power's trucking activities with the passenger car operations at Sigma Park, were further elaborated this week

Industry has been speculating on how Sigma was going to merge the widely different manufacturing requirements of heavy trucks with those of motor cars — no other company has been able to manage it

### Details

Manufacturing details, given to Industrial Week, indicate that the heavy commercials, including Mack and the big Mitsubishis will, in fact, stay at Sigma Power's factory in Port Elizabeth. So there is no change there

Leyland's Blackheath plant has been building for Sigma the L300, Canter, T-series and B1600 light delivery vehicles,

which will be moved to Sigma Park "during the next few months", says a spokesman for the company

It is not clear whether this will involve any change in component supply, but it is thought unlikely

What is uncertain, however, is what is going to happen to the Blackheath Plant which Sigma bought from Leyland for R14 million

The company decided soon after the purchase that it no longer needed the factory

The forecast drop in demand for cars and trucks has not as yet materialised, this suggests that Sigma's decision not to move into Blackheath — if taken on these grounds — might have been hasty

### Automation

On the other hand, Sigma's plans for its head office plant just outside Pretoria are well advanced

These include certain

aspects of automation being integrated into production lines to reduce the company's reliance on labour

The overall plan goes deeper than cosmetic rationalisation, the only major outstanding issue being what the company can do with its Blackheath plant

### Take over

It takes over officially from Leyland in January and it was originally intended that the light commercials would stay there and possibly be joined by the Mack and Mitsubishi models

## Timken presents plaque to SATS chief

DR KOBUS LOUBSER general manager of South African Transport Services (SATS) was recently presented with a commemorative plaque by Timken SA to mark the production of the 500 000th "AP" railway bearing at the company's Benoni plant

Timken's vice president of International Operations, Peter Ashton flew to SA to present the plaque

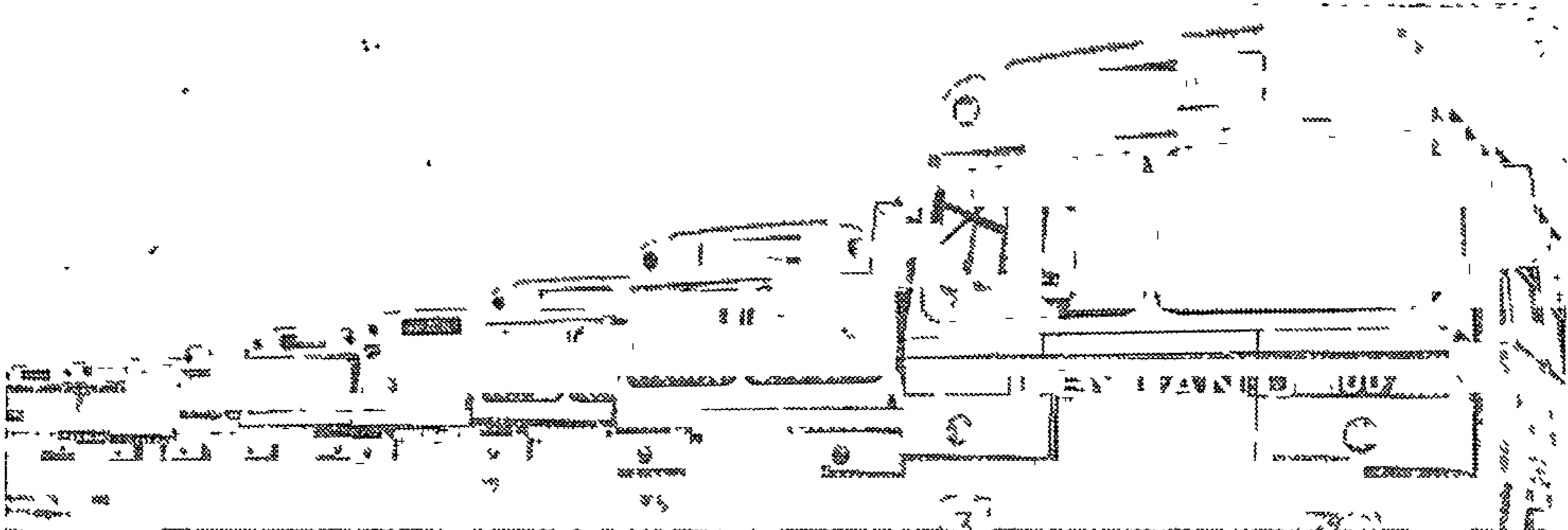
Dr Kobus Louber.

## New Cat proves



This Caterpillar 966D recently started work at Hippo Quarries' operation at Libanon Mine near Westonaria. The machine is fitted with a cab manufactured by Oshkosh in Paarl.

## With hopes for Leyland buses





# Robots... What these new workers could mean to YOU

(79A) Star  
15/7/82

Say the word "robot" and the immediate image is of red lights controlling traffic or mechanical monsters striding over futuristic worlds.

But the word may come to describe the biggest in man's lifestyle since he swapped trees for caves.

The images of "control" and "monster" may take on frightening new meanings as robots become capable of more and more tasks — replacing human beings — and are associated with unemployment and strikes, civil disorder, and unsympathetic, unrelenting change.

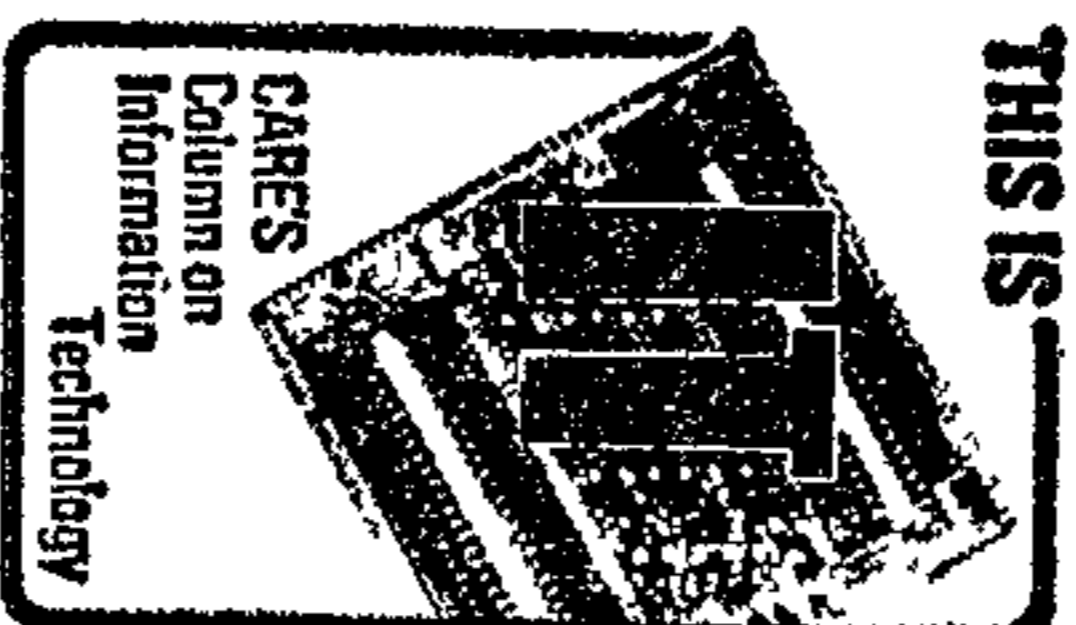
Robots are being heralded as the ultimate worker — fast, efficient, reliable and unemotional.

Their supporters claim they will not have personality problems, love affairs or hangovers, will not need fringe benefits, holidays or pensions, and will not need supervision.

Detractors fear this will bring widespread unemployment in unskilled labour — the workplaces now employing the greatest number of people.

## Numbers

The effects on society will be enormous, with occupations as varied as housewife and factory assembly-line worker being replaced by machines. Society will have to create new mechanisms to educate the public



## BY ROB SOUTTER

Increasing appearance of robots in TV commercials, with mechanical men drinking new, improved motor oil or rapping open lyres.

Yet they are not new. Many, many years ago, Dorothy Journeved along the yellow brick road to see "The Wizard of Oz," accompanied by a lion, a scarecrow — and a tin man.

More than a decade ago, in his monumental "2001 — A Space Odyssey" — Stanley Kubrick introduced a robot spacecraft controlled by a sophisticated but evil computer called HAL (note the play on IBM — Kubrick just moved each letter back one into the three daily rush hours of going to work, lunch hour and going home, robots mean that frustrating obstacle at street corners which raises blood pressure and slows journeys.

Younger people, fed on a diet of "Star Wars" and "Star Trek," see robots as huggable clockwork. Clowns such as R2D2, or as unrelenting automations without pity or emotion.

But a sure sign of changing times is the

genre for studying the effects of technology on society.

As long ago as 1940, author Isaac Asimov coined the "Three Laws of Robotics":

- A robot may not injure a human being, or through inaction allow a human being to come to harm.
- A robot must obey orders given it by a human being, except where this would conflict with the first law.
- A robot must protect its own existence as long as such protection does not conflict with the first or second laws.

In his book "I, Robot" — a play on Robert Graves' classic "I, Claudius" which portrayed the corruption of total power — Asimov used these laws to study the consequences of the introduction of robots into society.

Applications for robots seen by science fiction writers include mining airless planets for raw materials, exhausted on earth, driving cars to eliminate human error, and working as a slave class with humans living in total luxury — and decadence.

The futurist, a factually monthly journal forecasting trends, has no

doubts about the effects of robots.

"As robots gain in power and sophistication, they will bring on changes in human life at least as significant as those of the Industrial Revolution, and will raise serious social and moral questions."

In the factory, robots already installed can weld, lubricate moving parts, drill holes and ride along production lines performing these jobs.

In the home, they will be able to wash and do store dishes, vacuum, make beds, feed fires, cook supper, feed the dog and prepare a dry martini.

But the magazine warns that there will be a period of violent social conflict as unskilled workers see their future threatened.

At the same time, "myriad new industries will be built around the billions of hours of leisure time which will become available."

This is the essence of the robot revolution.

Jobs will be destroyed but jobs will also be created and the potential for improving the quality of life is enormous particularly because it is the

boring and repetitive jobs which will disappear.

The problem is that the new jobs, such as computer programming, and maintenance, require new, and usually higher, degrees of skill than the jobs threatened by robots.

Clearly there will be an immense need for retraining in the years ahead. In Japan, this is the responsibility of the industry concerned.

Some firms guarantee their workers a permanent employment, which not only prevents unemployment, but eliminates the threat of technological change.

The US magazine Business Week has called on private industry to initiate retraining programmes.

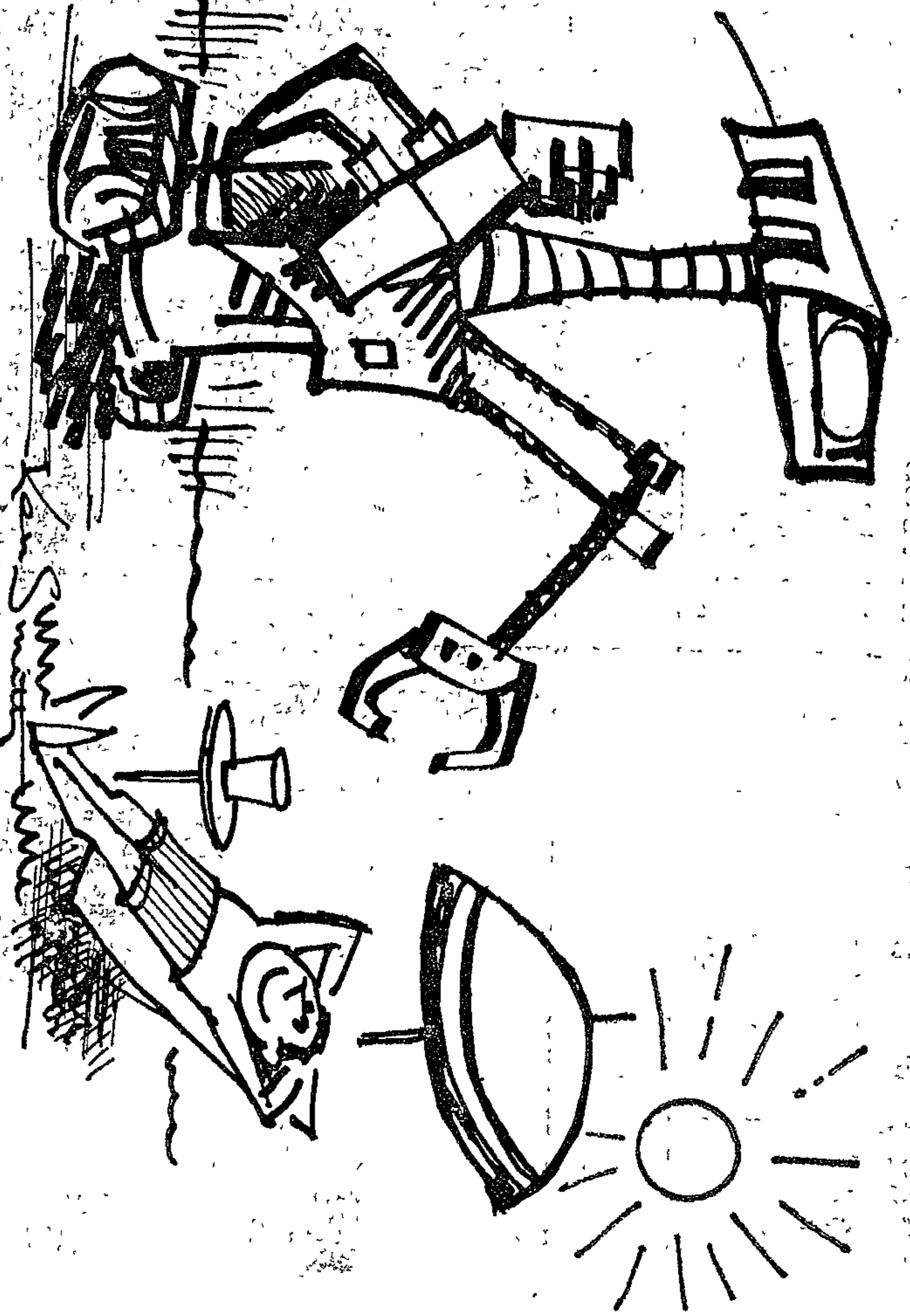
"US industry cannot leave a huge potential public programme to a public education system that is having difficulty teaching simple English and elementary arithmetic."

Planned introduction of robots will immensely benefit mankind.

More leisure would mean more time to develop the individual, and robots will do the soul-destroying jobs that have made machines "out" of man.

But haphazard introduction, without planning, and without social responsibility on the part of industry and government, will parallel the miseries of the early Industrial Revolution, benefiting some at the expense of others.

● NEXT WEEK: The advantages of robots.



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TRANSPORT

# Wage rises encourage automation

*Industrial Week*

THE MOTOR industry looks like setting the pace for increased automation in SA, with the announcement from Sigma that it can no longer pursue its traditional policy of labour-intensive manufacturing.

Sigma is the first motor assembler to have made a public announcement in favour of automation and does so, it says, because in the past two years it has had to concede substantial increases in wages "and it appears likely that pressures for further wage increases will be maintained".

He points out that org-

anised labour unions have pressed wage claims hard in the past two years and industry is now counting the costs against automation.

Butler describes Sigma's policy as part of a rationalisation package which underlines the seriousness with which the company is now facing the next four years of economic doubt.

Its original plans were to expand production by commissioning the R14 million factory it bought from Leyland at Blackheath, in July last year.

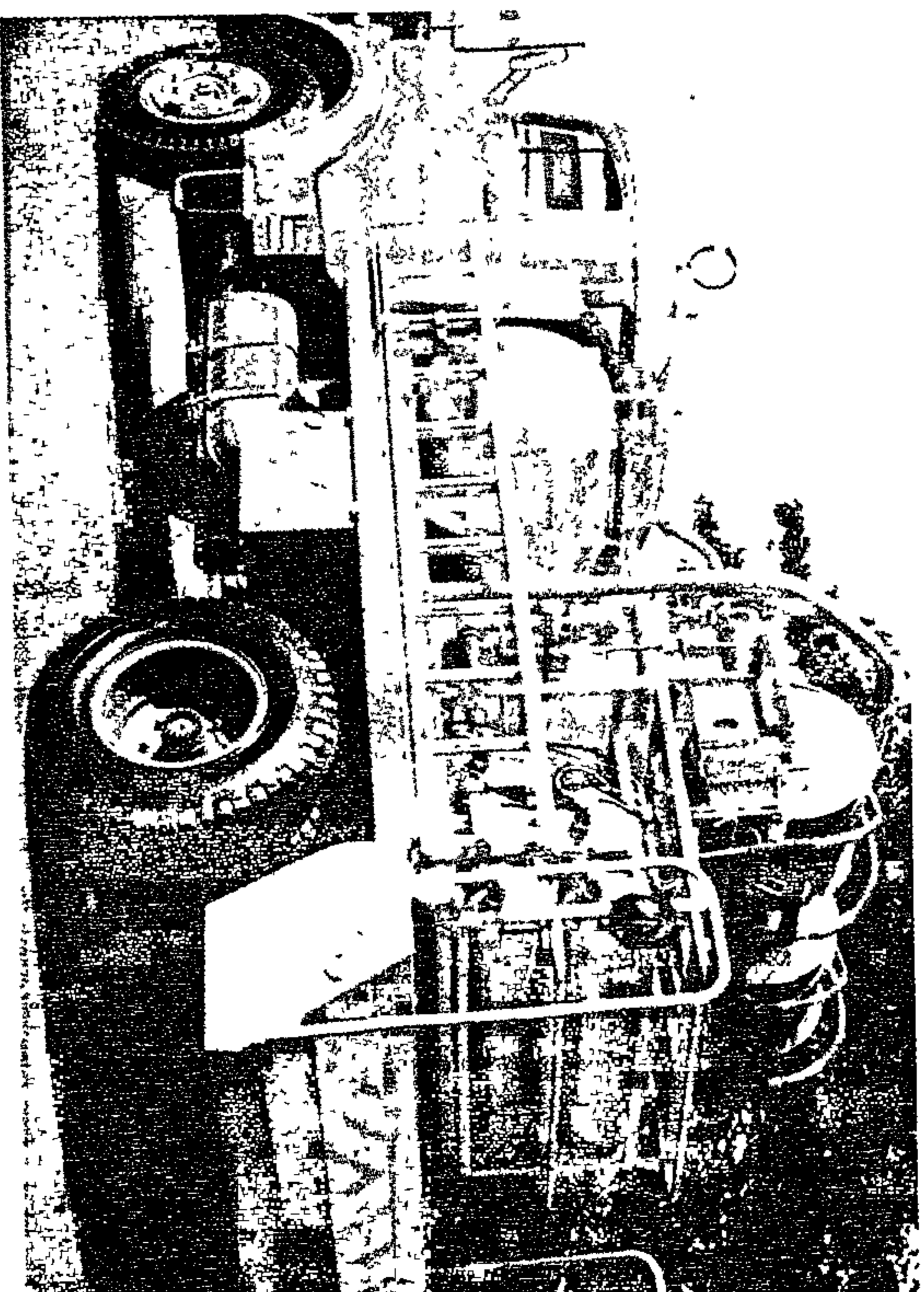
This deal becomes effective in January, but Sigma has had second thoughts

Butler says "developments in the intervening period have caused Sigma to reassess its strategy".

"Recent formulation of Government policy indicates that not only will deconcentration benefits not be available in the Western Cape but also that the transport and other subsidies granted to the motor industry are to be phased out."

"It appears likely that pressures for further wage increases will be maintained, and Sigma has every incentive to centralised production and to switch from labour-intensive to capital-intensive manufacturing techniques."

## Iscor initiates fire fighters



Mather and Platt has recently supplied Iscor with four Ansol "Twin-Agent" crash rescue, fire fighting vehicles for the protection of the Sishen, Thamazimbi and Grootegeluk plants. The company claims that the vehicles are ideally suited for the fast knock down of fires in Iscor's fuel storage areas, large off-highway vehicles and major plant and equipment.

**Silencers**



# Manual labour to be cut on gold mines

Star 3/5/82  
179A

By Patrick McLoughlin  
The gold-mining industry hopes to achieve a fully mechanised stoping system in which manual labour will be "drastically reduced," the president of the Chamber of Mines, Mr

L W P van den Bosch, said today

Mr van den Bosch, who gave the plenary speech at the 12th Congress of the Council of Mining and Metallurgical Institutions in Johannesburg, did not specify by how much the industry was looking to slash manpower.

He said, however, that during the period from 1961 to 1981 the number of people employed in all areas of mining rose from 616 000 to more than 722 000.

The gold mines had traditionally been labour intensive because of the lack of machinery able to cope in narrow stopes and hard rock.

The cost of mining at increasing depths with the highly expensive support systems required, however, had made it imperative to find more efficient methods of mining and the chamber's research organisation began working on new stoping technologies in the mid-1960s.

A "measure of success" in improving current mining methods had been achieved with the development of hydraulic drills — which had considerable advantages over the traditional pneumatic drills — by the deve-

lopment of more efficient blasting methods, and by the use of high-pressure water jets to clean stopes

Introduction of a combination of mechanised stoping with conventional blasting had involved the development of a reciprocating flight conveyor in which hydraulic drills could be mounted.

"With this technique it is hoped to achieve a fully mechanised stoping system in which manual labour will be drastically reduced," Mr van der Bosch said

In underground tests to date the prototype hydraulic drills had been shown to be capable of drilling more than twice as fast as conventional drills and to be "very considerably more" energy efficient.

Mr Van den Bosch told delegates that of all the facets of the industry in recent years, that of technological innovation and development was one of the most exciting.

SIGMA - 2 FM 2/7/82

## Turning to capital

Motor manufacturers have long been under official pressure to maintain labour-intensive production methods. But, for some, the price is too high and the first to break from the pack is Sigma.

MD Fred Butler confirms that "Sigma has decided to become more capital-intensive." Previous policy, he adds, was to employ costly labour-intensive techniques. But planning will follow a more automated route at revamped Sigma Park where capacity is being increased nearly threefold.

Recruitment at Sigma is now at an all-time low. At the end of last year and the beginning of 1982, there was a reduction of 400-500 employees, and further shrinkage is expected.

The motor industry pursues a policy of creating jobs for blacks but, having looked at labour rates over the next five years, and comparing this with the cost of installing equipment, Sigma is believed to have had little choice but to turn to automation.

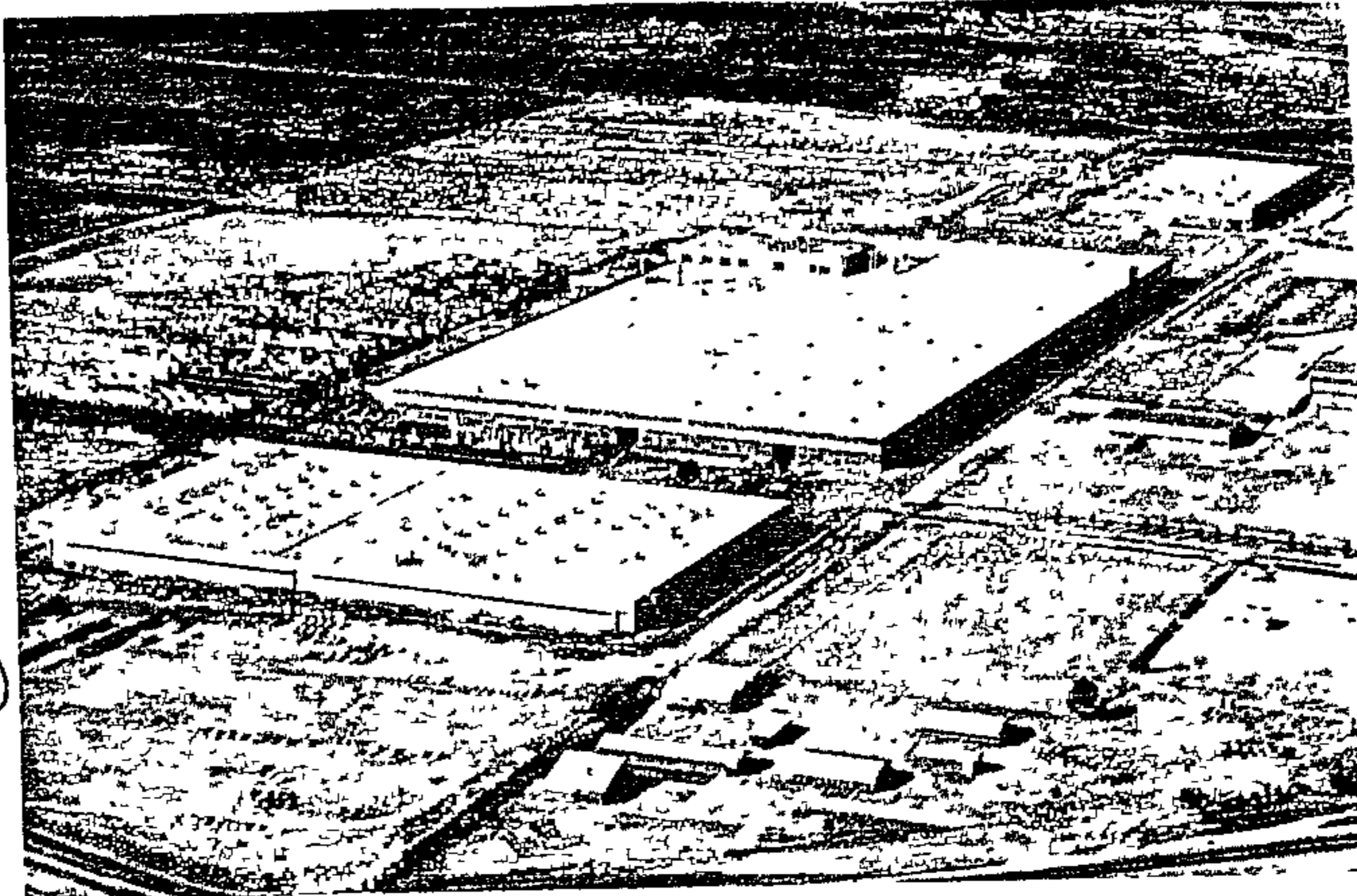
Expansion at Sigma Park will cost around R40m by the end of this year. And improved labour productivity is one of the priorities, although employee complement will be held at existing levels as long as possible.

Although Sigma is situated near Mamelodi, there is no large pool of automotive skills in the township to draw on. The main labour objective will be to upgrade employees through training and to ensure that assembly routines are planned to best advantage.

A general economic slowdown is expected in 1982/83, and the outlook for 1984/85 is problematical. Clearly Sigma has decided to play safe by consolidating at Sigma Park and taking a more cost-effective line.

Explains Butler "Sigma has every incentive to centralise production and to switch from labour-intensive to capital-intensive manufacturing techniques." It will expand capacity at its main plant at Pretoria, for car and truck production instead of commissioning the Cape's Blackheath plant, bought from Leyland for R14m.

In addition to "substantial increases in wages over the past two years, and pressures for further wage increases," he says



Sigma Park ... automation the answer

deconcentration benefits may not be available in the western Cape in future. Transport and other subsidies granted to the motor industry will be phased out from March next year "just three months after Sigma's purchase of Blackheath becomes effective. We are placing a greater reliance on automation to counteract the effects of spiralling labour costs," he says.

Capacity at Sigma Park will be increased from a current 284 units/day to 800/day by double-shifting its new paint shop. The introduction of two separate assembly lines, including trim, mechanical and finishing, will enable the company to produce 630 vehicles/day in a single shift.

No plans have been finalised for Blackheath. Sigma Power Corporation, which manufactures heavy earthmoving equipment, could use the space to supplement its Port Elizabeth facilities, or the plant could revert to Leyland on a lease basis for its own expansion plans.



# Workers who never

1794  
0- Blyatsh  
Strike

29/5/82

The workers were clustered around a car frame like surgeons in an emergency ward, nodding up and down, spotting welding to perfection.

Not a word was spoken, not a coffee break was taken in the Saab plant at Trollhattan in central Sweden. The workers were all robots. Not so long ago they themselves had come off of a production line at one of the factories owned by Asea, Europe's largest producers of Mechanical men.

Other Swedish robots were cutting, grinding, washing, shaving and punching gears at the Scania truck division of Saab's factory in Soder-talje, near Stockholm. Still more are polishing stainless steel sinks at a mill in Ramnas, in central Sweden.

In West Germany Asea robots assemble entire oil pumps at a car plant. In Britain they remove heavy bags from a factory conveyor belt and stack them neatly on pallets.

When Czech playwright Karel Capek first coined the word "robot" in 1920, it was pure science fiction. Today there are roughly 20,000 real, if not live, robots performing hazardous and/or monotonous tasks in factories all over the world.

Around 1,200 robots work in Swedish factories. The United States has 3,000, Japan perhaps 5,000, West Germany 1,400. The Swedish Association of Mechanical and Electrical Engineers has estimated that the country will employ 5,000 robots by 1990.

Robots have several advantages over human beings on the assembly line, the main one being that they don't go on strike. But while there are fears about machines taking jobs and creating unemployment in Sweden, the Swedish trade union movement has no intrinsic objection to industrial robots.

Ever-increasing payroll costs are one

reason why Sweden is playing a leading role in developing the industrial robot. These have forced manufacturers to introduce labour-saving devices. But there has also been pressure from the unions for improvements to the working environment and robots play their part here too.

Today automated factories of the Asea multinational electrical engineering company provide nearly 75 percent of all the robots at work in Sweden. Last year Asea took over the robot division of Electrolux to give it an unassailable lead in this field in Sweden, with 90 percent of its sales going abroad.

The company has been responsible for several technological "firsts." In 1974 they launched a "new robot generation" with microprocessor-based control systems. Such improvements enabled robots to move along a curve, gave better pattern positioning and picking, and allowed for repeat functions and conditional

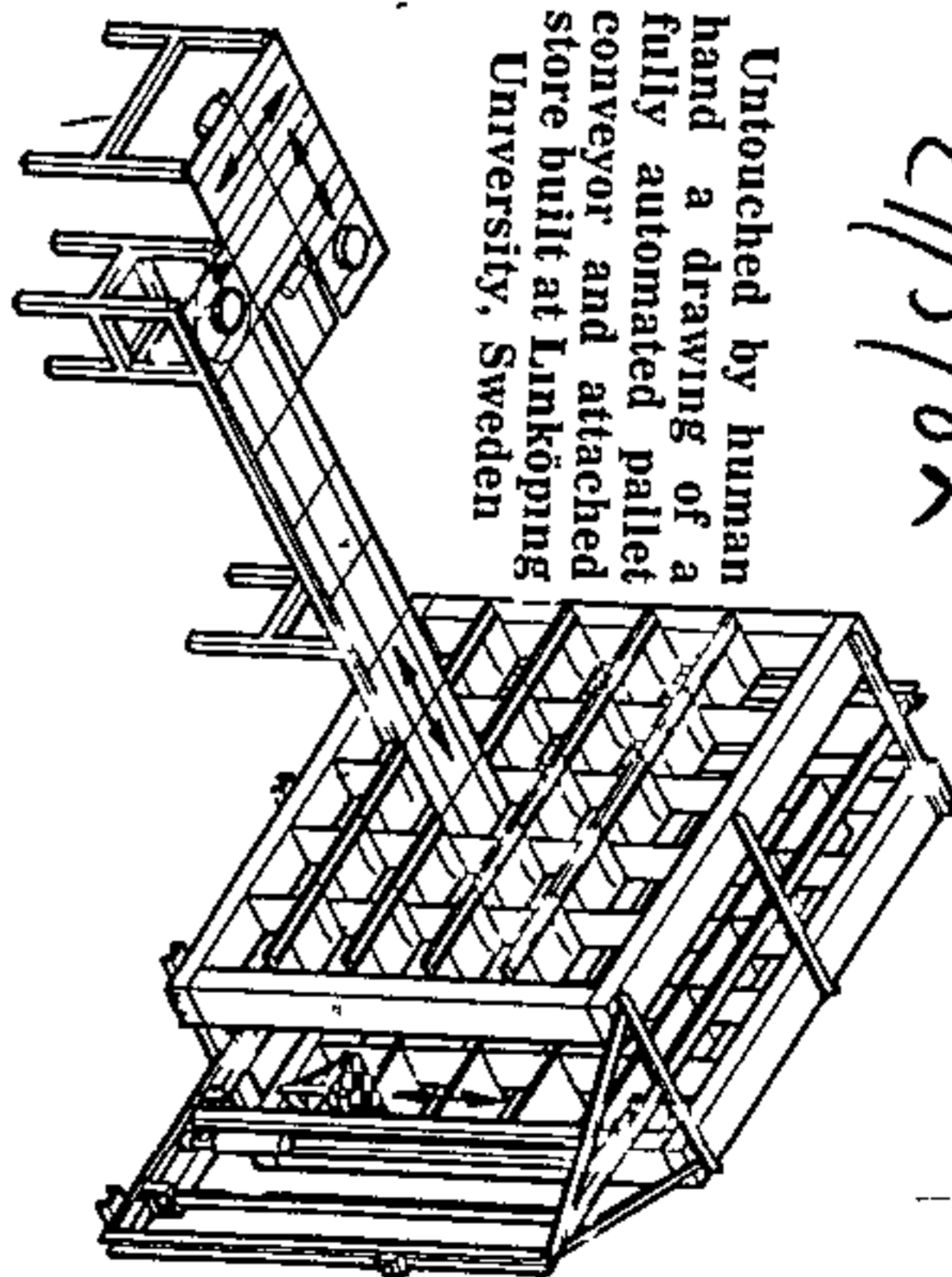
jumps (in other words, the robot could make decisions).

By 1979 Asea had introduced a robot with a "sense of feel." Hans Skoog, technical manager of the company's industrial robots, division said "This robot makes it possible to use an entirely new type of control, where the movements of the robot can be continuously determined with the aid of information from a sensor."

The robot is programmed to be able to search in two or three dimensions for a corner, or to vary feed rates appropriately during a grinding operation. Functions deemed too complicated a few years ago because they required a "human" touch.

"It can also follow a

Untouched by human hand a drawing of a fully automated pallet conveyor and attached store built at Linköping University, Sweden



path which is not clearly defined and which deviates from the programmed path and the system permits the automatic adjustment of programmes while the robot is still in operation," said Skoog.

Feasibility studies are conducted to help potential customers determine how to use robots to maximize profitability and cut manpower costs.

## TRANSITION FROM

In their special attention transition from submissions by 45 submission Departments, organisations and individuals of the report field, as well as findings transition from University of Bloemfontein

The crucial pupil, on entering make a rapid university with supervision school, he becomes a par university has a far larger become a mat accommodate himself how cultural act

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# Paperless office not in sight

179A

Star 11/2/82

**From the Economist**  
LONDON — The vision of the paperless office is future-gazing nonsense. Even computer giant IBM believes paper will be found amidst the micro-electronic wonders in the office of the future.

The Xerox Corporation goes further: it contends that many offices will have more paper in them not less — together with more automation, of course.

The resolution to this paradox of the "paperful" office lies in some simple economics. The aim in installing and switching on the electronic office is to boost office productivity and cut the soaring overhead costs that give company accountants ulcers.

One potential spin-off of automation is to slash the cost of producing paper documents by up to half. That means the quantity used will increase, says Xerox.

The current high cost per page of a document — as much as R300 for a technical or mathematical report — is largely a matter of labour. Human effort is required in writing the report, editing it, rewriting it, printing it and so on. Paper-pushing involves managers as well as secretaries. The typical manager, whose salary is three times that of a humble secretary, spends more than half his time producing, reading or discussing documents. His secretary might spend only one-sixth of her time in typing them.

Booz, Allen and Hamilton, the American management consultancy, estimates that a colossal 75 percent of total office costs goes on managers, only 12 percent on secretaries. Yet, Xerox maintains, little investment goes into productivity-enhancing equipment for managers: only 29 percent of total office investment at present is spent equipping the (expensive) manager.

This is crazy, argues Xerox. White-collar workers constitute 52 percent of the American labour force of 103 million people. Their cost is rising at 10-15 percent a year. And a major proportion of the paybill is spent on the executive.

Xerox's proposed solution is based on its Ethernet local network. It has carried out a number of pilot projects to prove its point.

## IMPRESSIVE

Impressive cost reductions shown come from one such experiment, carried out in the company's own legal department. Lawyers were given so-called intelligent work stations — computer cum-word processors — wired into a local network. The lawyer wrote his report, memo or whatever on the work station and edited it himself. Then the report was electronically mailed to a printer, which produced the final, pristine document. The approach cut out much costly retyping and editing.

Xerox claims that using an Ethernet-based electronic office reduces the turn-round time for a complicated

report from 20 to 74 days, and pushes up output (in terms of final pages) by 100-150 percent. Thus the cost a page is reduced.

There are some nasty snags, though. First, the high cost of installing a local network will deter many. At present, the intelligent work station will cost about R12 000 — typically 30 percent of a manager's salary. The gamble on a corresponding jump in productivity is something many companies will treat with understandable scepticism. Ironically, the companies with the highest white-collar costs (and so the most to gain) are the information-technology companies, like Xerox and IBM, themselves. Ethernet will find at least one customer in Xerox.

The second snag is that relatively few managers can type. Worse, several surveys have found that many are firmly set against learning.

A third problem is that many office tasks do not lend themselves readily to automation. Mundane chores like much accounting or payroll work can be handed over to computers. Reducing the labyrinthine complexity of other office tasks to a programmable form is trickier.

Whether the Xerox cost-cutting approach is taken or not, paper will not be eliminated. Bell and Howell, which makes storage devices using microfilm, admits paper has tremendous advantages as a very flexible means on which to store information.

UOST



INFORMATION TECHNOLOGY

Sven Johanssen (24), living in Oslo, was bored with life on the job. His wife was badgering him to find work, and showed him a jobs advertisement in the local paper.

Volvo, the giant Swedish motor company, was looking for 7 000 workers — good pay, pension, generous holidays

Sven tossed it aside. As in most Western countries, young Swedes would rather be out of work than work in factories. In the event Volvo filled fewer than half the posts.

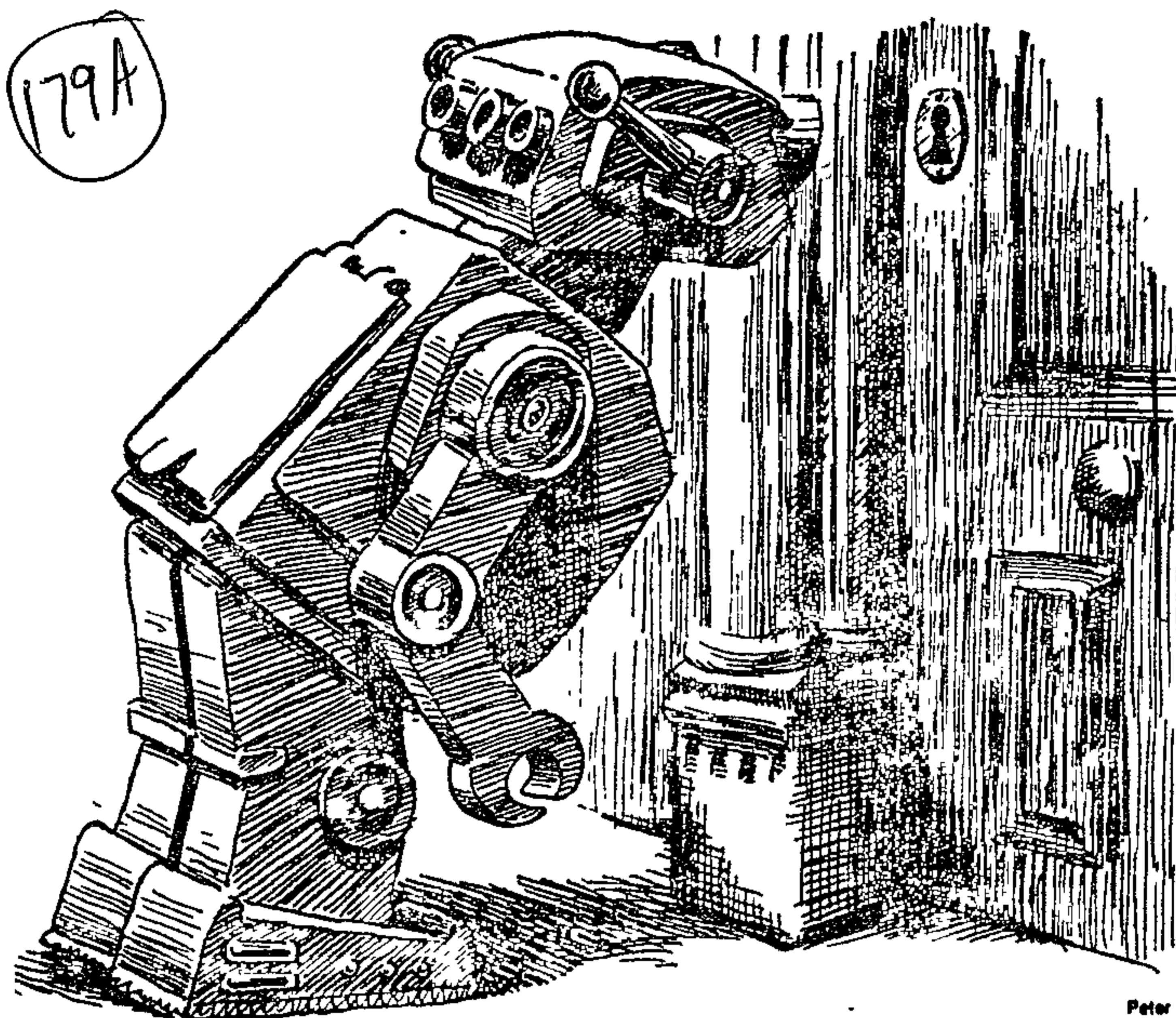
The car company had noticed the growing resistance to factory labour in the early '70s and had made a highly original move to overcome it.

Robert Ardrey, the anthropologist-author, was called in as a consultant. He told me at the time "No wonder the kids are hating factory work. Imagine standing at an assembly line eight hours a day all your life, tightening nuts or adjusting carbs? It's inhuman."

Assembly line work is mind-numbing. Workers have no identity, no challenge, no thoughts except for the clock.

So Volvo introduced the "star system," which dispensed with assembly lines. It arranged its men in small teams, each building its own cars, some better than others.

The team which built the best was looked up to. Every-



Peter T

While robots are relieving factory workers of dull, dirty and dangerous jobs, computer researchers say the computer will soon be relieving management of some of the drudgery of office work.

(Illustration: The Times)



THIS IS

Computerised robots are taking over the factory floor. By 1985 all Japanese assembly plants will be manned by robots, and other countries will be forced to follow. What about unemployment? And what does it mean to South Africa? This is the fourth article in a series on Information Technology (IT) by James Clarke.

body knew the team leaders. People acquired identities and reputations. There was challenge. It was slower, of course. But the

product was better, and the men happily becoming unattractive to an increasingly educated young generation.

The respite was but temporary. Factory work under any guise was sim-

ply becoming unattractive to an increasingly educated young generation. Absenteeism soared and the survival of Volvo was

threatened.

Volvo then did what other Western car manufacturers have been doing since in 1980: it sent its executives

to visit Japan.

The Japanese assembly plants were curiously devoid of people. Production was increasing, production costs were being kept down and the quality of workmanship was consistent. They were cleaning up on the export market.

The Japanese were replacing men with robots. Robots costing R4 an hour to operate, robots that never knocked off for lunch or union meetings or got their fingers mangled or had hangovers on Mondays, robots that were prepared to do dirty jobs, dull jobs, dangerous jobs, robots as strong as 40 men, robots that could work in unlit and unheated factories or in temperatures too high for a man.

The robots are more like automated multi-jointed arms whose hands may be claws, spanners, welders, riveters or spray-guns.

Each robot had its own tiny micro-computer. Its human programmer would guide the robot's arm step by step, pressing the computer's memory button each time. The robot then performed that task meticulously day after day, night after night.

It could be converted to other work simply by slipping in a different memory and fitting



# The robots are on the march

Daigish, The Star Editor, Japan, last month,

told me "I visited an assembly plant that was 98 percent run by robots

"At Datsun's Kyushu plant they were paying R52 000 for a robot. A man doing the same task would cost R14 806 a year — that's just his salary. It does not take into account the mistakes he might make and all his fringe benefits."

So the robot is paid for in less than three years

By 1985 the Japanese expect to have all assembly-line work in all

types of factories done by robots. This year a factory has made 50 robots programmed to reproduce themselves.

In Japan, company employees are guaranteed jobs for life. This might explain their readiness to accept robots. But part of the reason is also because the Japanese are beginning to consider it offensive to be employed purely for their labour and not for their creative abilities.

Fiat in Italy believes that the next generation of robots (around 1990) will be able to see, hear, and have a sense of touch. And these will cut industrial manpower 90 percent.

Adam Osborne in "Running Wild" a book about computer technology, predicts: "Given the tasks that robots will be able to perform, their impact on the blue-collar worker will be profound. Most

assembly-line jobs will be eliminated"

The computer itself undoubtedly will cause jobs upsets here and there. It already has. 32 000 Swiss watchmakers lost their jobs in 1975 because the Japanese flooded the market with cheap but efficient microchip watches

But that was not an instance of robots ousting workers. That was one of an industry failing to see the

significance of the microchip. Maybe it comes to the same thing.

Bearing in mind how automation, a generation ago, actually created jobs there is no reason why robotics should not do the same. British trade unions fought off automation, and because of that Britain lost great chunks of its export trade (and jobs) to more efficient countries such as Japan and Germany

The most auto-

mated country in the EEC is also the richest — Germany. The least automated, Britain, has the most unemployed.

The computer will not destroy work opportunities although it will destroy some occupations. But these will be replaced by new opportunities.

Robots and "smart" machinery in offices have cut down on monotonous work and pro-

● To facing page

● From facing page

mise a plethora of other forms of work which will require creative ability, something which has been under-utilised in western society and totally ignored in the Third World. The Japanese are actually worried that it could create too many jobs.

Information technology (IT), whether it is creating robots whose intelligence extends only to tightening bolts or

whether it is amassing information for data banks, will need designers, technologists, technicians, programmers, teachers, writers, editors, lawyers, librarians.

In South Africa the tramp of robots is still a distant sound. Hardly perceptible. Microcomputers are still rare in offices, but their numbers are building up fast.

Information technology has the characteristic of coming in a rush.

Japan's extraordinary economic vibrancy in a world largely suffering recession has caused Western economists to warn their governments that if they do not accept and encourage the new technology as Japan has done they will not be able to compete with those who do. That is why the British Government recently voted R140 million to "sell" the technology to the public. This year has been proclaimed Information Tech-

nology Year.

There is concern by some in South Africa that this country might not be listening — like the Swiss watchmakers. That we are still banking on cheap labour working in traditional factories. We certainly have a vast supply of people prepared, in fact eager, to work on assembly lines. But for how long? More efficient education processes, via information technology, will change people here as surely as it is doing overseas.

Such transition

can happen fast. Look again at Japan a Third World country in the 1940s, a high-tech nation in the 1960s.

In the 1990s "fourth sector" of industry will have taken off in South Africa. We have the traditional three — primary (agriculture), secondary (industrial) and tertiary (commerce). The fourth sector will be based on IT. It will cut out all the others and become the dominant force.

The computerised robot is expected to take over all assembly lines in Japan in the next three years. This one, at Datsun's Kyushu plant, has taken over a dull routine job, releasing workers for more stimulating tasks.



# Views conflict on labour intensive development

ARGUS

4/5/84

179A

CONFLICTING views on the need for capital intensive industries as opposed to labour intensive industries were presented at two meetings in Cape Town yesterday.

Mr Wynand van Graan, managing director of the Bophuthatswana Development Corporation, told members of the New Southern Africa Club that developing countries should not steer away from capital intensive industries.

He said capital intensive industries had become a fact of life without which development would not be possible.

But Mr PTC du Plessis, Minister of Manpower, speaking at a Cape Chamber of Industries luncheon, appealed to employers in South Africa to retain as many jobs as possible.

He said the concerted

efforts of both government and private enterprise were needed to overcome the problem of the country's oversupply of unskilled workers.

## DECENTRALISATION

The Government had made generous concessions for the decentralisation of industry to promote the creation of employment opportunities in rural areas, where large numbers of unskilled workers were concentrated.

The key to the unemployment problem lay partly in a more aggressive effort to decentralise industry and employers could help with this process, especially if emphasis were placed on labour-intensive projects, Mr du Plessis said.

Mr van Graan said South Africa had promoted labour intensive activities by means of con-

cessions, which had put a heavy emphasis on large-scale employment of labour.

Development corporations boasted that they were investing only about R7 000 to create a job opportunity and as this was labour intensive it had to be commended.

But concessions for the employment of more labour for a given job could promote inefficiency.

## COMPETITIVE

An inefficient manager would hire twice as many people to perform a given task than an efficient manager.

The world was moving towards employing less labour. One could not go against this trend and still remain competitive.

Industry in less developed areas had to be competitive. If the competition became computerised, for instance, then it had to follow or else it would not survive.

Labour intensive activities were on their way out. The last remaining would be the production of handcraft which sold because it was made by hand, Mr van Graan said.

Technically speaking

(171A) Stan  
16/4/84

## Future looks bright for industrial robots in South Africa over next 10 years

By Stan Kennedy

The use of industrial robots on South African production lines is expected to increase rapidly in the next 10 years, despite their slow take-off compared with that overseas.

Mr Terry Riley, technical manager, robots, Afrox Welding Division says of the 26 000 robots that will be in use in Europe by 1986, 4 000 will be arc-welding robots.

"The projected industrial robot population in industrialised nations is dictated by the need to increase productivity, cut costs and improve quality in highly competitive markets," he says.

"After making an international study three years ago, we decided to import robots for the arc welding sector for which we see a market potential of about 15 a year."

"A lack of awareness of the benefits of production lines and the failure of industrialists to identify their applications are responsible for the tardy introduction of robots into South African industry, he says.

□ □ □

Control Logic of Durban, which was awarded the Design Institute Shell Design Award last year for its Striker electronic ballast, has secured world patent rights for the design and it is preparing to market the product worldwide.

Conlog claims the noiseless ballast will reduce industrial lighting bills by 25 percent and, by totally eliminating "flickering", it will improve safety in some factory environments.

It gives off very little heat and allows a 10 percent reduction in air-conditioning load, resulting in substantial savings to commerce and industry.

The ballast can be operated on AC or DC current, which means it could find applications in emergency lighting conditions in rural areas.

□ □ □

Gundle Plastics has developed a new shrink film that is stronger than conventional shrink film.

One of the bugbears of shrink film use is burning and holing because of gauge thickness variations. This leads to pack failure and a poor brand image. With the new Shrinktite, the problem is eliminated as the product achieves a constant gauge accuracy to exacting tolerances.

The manufacturers say it is possible to downgauge Shrinktite by a minimum of 20 percent and still have a strong pack.

□ □ □

The installation of a Foxboro micro-computer-based distributed control system at African Products' wet-mill at Germiston will bring improved efficiency and lower production costs.

Mr Roy Thorsen, project manager,



# Japanese workers are not happy with the 'metalmen'

179A

Stan

17/3/84

By Geoffrey Murray

TOKYO — A new industrial medicine university in southern Japan is offering the first postgraduate course in diseases stemming from the spread of high tech robots in the workplace

The move comes at a time when workers are beginning to examine their earlier ready acceptance of robots taking over the dirty and dangerous jobs on factory assembly lines

Explaining the need for robot-related medical studies, university president Kenzaburo Tsuchiya says: "Robots and micro-electronics office equipment have created new stresses in the working environment.

"Reports are common now of anxiety, stress, bad eyesight and other symptoms which must not be overlooked in considering the relationship between man and machines."

Japan is the undisputed "Robot kingdom" of the world. In various key industries the push is on for near workerless factories with most tasks left to the computer-controlled "Steel collar" staff.

An estimated 30,000 new metalmen are being produced annually at present, and by 1990 well over half a million are expected to be in industrial use.

Unions previously went along with the trend because most workers were happy to be relieved of nasty production tasks—especially those threatening their health. At the same time, few workers lost their jobs through automation, older ones retiring early with good compensation, younger ones retrained for

other tasks.

But that easygoing attitude is changing. One recent study found eight of 10 blue-collar workers who work alongside robots were unhappy and worried about their health.

Common complaints were insomnia, jumpiness and constant irritability, poor personal relations and the boredom of not doing something physically satisfying. Many workers, in fact, would prefer to go back to their old back-breaking jobs

Frequently heard complaints are, "I want to work alongside someone to whom I can relate."

A car assembly worker describes how the assembly line is always tense because. Suddenly, without warning, the robot goes berserk, throwing parts and products through the air.

Only two fatal accidents involving robots have been reported so far, but many workers reportedly live in fear of their lives.

They cite the example of Kenji Urata, (37) trapped under the 1.5 ton steel grip of a robot three years ago.

Urata was the sole human supervising the work of the robots. It was 20 minutes before anyone spotted something was wrong, and, with the unconscious Urata the only one able to operate the machine, the robot arm had to be cut off — unfortunately too late as the worker died on the way to hospital

Both the labour movement and the government have now begun reconsidering the implications of the rapid robot revolution.

179A

# Standard's robots oust people

STANDARD Bank's R13-million investment in its 278 Autobank machines is paying off — at the cost of jobs

The head of the bank's personal banking services, Gutch Vickers, says the Autobank network has enabled Standard to reduce its teller staff by 50

This is a saving of about R650 000 a year in salary costs alone  
In 1983, 14 400-million transactions

were recorded through the Autobank network, and in December a record 1 700-million transactions were processed

Standard has by far the biggest automatic teller machine network of all the banks, and last year installed machines at a rate of one every three days

The linkage of its savings accounts to the machines — with the added incentive of one percentage point

higher interest <sup>26/2/84</sup> helped to increase the balances held in Standard's savings accounts by R28-million (2,1%) in the quarter to December

It was the only big bank to achieve an increase in the balances of savings accounts in the three months

Another reason, says Mr Vickers, is that unlike some of its competitors, Standard Bank clients are charged nothing for operating a savings account

Time



# Will manual farm labour become a thing of the past?

ISRAELI agriculturalists are turning to computers in a bid to contain soaring production costs and maintain their competitive edge on lucrative world fresh produce markets

Computerisation in agriculture was initially developed by the Israelis to overcome the problems caused by terrorist attacks on farms, the country's political isolation, harsh climate and meagre water resources. But Professor Benjamin Zur, dean of the faculty of agricultural engineering at the Technion-Israel Institute of Technology in Haifa, believes computers also hold the key to cost-cutting farming methods

"Farming is a complicated business," he says "There are far too many variables, such as weather and soil conditions, capital investment and operating costs, for the farmer to handle alone. He needs a computer to help him."

The computer, he points out, has the ability to store all the vital information a farmer needs, then usefully integrate it so he can derive maximum yield at minimum cost.

"In a nutshell," the professor adds, "it is all a matter of control and automation, and the computer is involved in both."

An experiment now being done on the Tech-

non campus by Professor Ido Segner involves two co-ordinated computer processes in computer-controlled greenhouses.

"First," he says, "the many factors which influence the growth of a particular plant in a greenhouse — such as temperature, humidity and daylight — are fed into the Technion's main computer, where they are analysed and integrated."

### Gardener

"The computer report tells the gardener the most practical conditions for growing plants in the greenhouse under particular outside conditions. For example, on a chilly and overcast day late in winter, the computer will tell the gardener precisely what adjustments should be made to the environment inside the greenhouse to get the best growth from tomato seedlings."

"If the computer says a certain amount of heat should be added from a conventional furnace, the amount indicated will not be suf-

Micro-computers are already used to sort and size fruit. Now new Israeli research projects also look into other ways of using computers to automate agriculture.



ficient to waste fuel or so miserly that the plant doesn't grow properly."

The second computer process, says Professor Segner, eliminates the gardener.

Data from the Technion's main computer, he explains, is fed into a micro-computer, which functions like a robot

"Every two minutes, night and day, the micro-computer analyses all the data from appropriate instruments, such as thermometers, barometers and hygrometers, in the greenhouse. It then compares the existing conditions with the information which, according to the main computer, is best for plant growth."

P.T.O.

"If, for example, the main computer says that tomato seedlings grow best at a particular temperature, but the micro-computer reads a different temperature in the greenhouse, the adjustment is made automatically. This may merely mean opening a window if the inside temperature is too high, or closing it if the temperature is too low.

"If the windows are all closed and it is still too cool, the furnace may be started. But, whatever the computer's response, it will be cost effective."

The computer, says Professor Seginer, can determine if the cost of a particular function, such as burning fuel for heat, will result in a greater increase in value for the seedlings.

"We are," he adds, "trying to find the economically optimum conditions for a commercial greenhouse. The Technion greenhouses are of conventional designs that are common throughout Israel. It is only the computer operation which makes them different."

### Packing

Another agricultural scientist at the Technion, Dr Kalman Peleg, is working with Dr Donald Dewey, of Michigan State University in the United States, to find ways of protecting produce from damage while in transit.

The project involves a study of crating, packing systems and methods of transportation.

Dr Peleg has designed several mathematical models for the packing of fruit and vegetables. He tests his theories by inserting a delicate sensor into pieces of fruit or vegetables, which are then packed into various types of crates.

### "Sniff"

The crated food, he reports, is subjected to different types of transport. It is bumped along in trucks, pitched and yawed in ships' holds and slung into the cargo

compartments of aircraft.

"All the time," he says, "the sensors are picking up what is actually happening to the fruit while in transit — how much it is being crushed and how the motion of the vehicle contributes towards bruising."

One sensor, he claims, can even "sniff" damage.

"Crushed fruit and vegetables," he explains, "give off a particular vapour with an identifiable scent. The sensor picks up the scent and, with the help of a computer, assesses the extent of damage and determines if the damage is so great that it would be a waste of money to ship a particular crate."

### Plan farm

Dr Peleg points out that micro-computers are also being used to automatically sort and size fruit as well as develop and design packaging for fresh produce.

Agricultural scientists at the Technion are also considering the feasibility of using computer technology to plan, build and operate a farm.

A computer-aided design/computer-aided manufacture (CAD/CAM) system can, according to Professor Zur, select the most practical location for a farm. It will then determine the best way to site the various components, such as farm house and sheds, internal roads and irrigation systems.

"Once it's all in place," he observes, "the computer can then govern the farm's operation so it is most productive at the least cost."

### Irrigation

A Technion graduate, Mr Gabi Weizman, has already set up a company at Moshav Magen Shaul, to specialise in the computer-aided design of irrigation systems.

Fields in need of irrigation are plotted in computer language and integrated with such information as planned usage, water availability and price, flow rates and pressure. The computer then produces a print-out that details the most practical installation scheme for an irrigation system and provides a full plan of plots, elevations, pipe sizes and lengths, where and how pipes should be placed, the most efficient way of using the installed equipment and the cost of installation and usage.

Mr Weizman estimates that the average farm using a computer to help with the design of its irrigation system saves about 20 percent of installation and usage costs.



# Auto bootfin's for Techn' talks

MOTOR industry bootfins from throughout the country will converge on Port Elizabeth next week for a technical review of automotive engineering in South Africa

In a first-ever seminar focused exclusively on the technical aspects of automotive engineering, a panel of eight speakers will examine the current state of the automotive art in South Africa

"With the inception of the local content programme in 1967, South African mechanical engineers have done a tremendous job in adapting and developing designs to suit unique local conditions," explained Mr Don Gillard, chairman of the SA Institution of Mechanical Engineers —

organisers of the seminar. Among the novel de-



By Louis Beckerling  
Business Editor

mands placed on local designs," said Mr Gillard, are

- "The fact that 60% of our market is situated at an altitude of 1 800 metres above sea level
- "A motoring public which is among the most discerning and demanding in the world
- "A commonised component industry
- "Our climatic conditions"

Another feather in the cap for SA mechanical engineers, says Mr Gillard, is the successful engineering production of prototype vehicles locally

"This is the first seminar of a purely technical nature where automotive engineers in South Africa will meet to advance their learning and discuss common problems," said Mr Gillard

The seminar will be held in the Great Room of the Hotel Elizabeth and starts at 8am with a welcome from Mr Gillard and an opening address from Professor H G Hattingh of the University of Stellenbosch

First speaker to follow will be Mr D H Barnes, of Ford (SA), who will talk on *Planning Cars for the SA Market*

An abstract of Mr Barnes's paper indicates that he will discuss the role of product planning with special reference to the limitations imposed on planning

by the SA market. These include aspects of investment, volume, local content, timing, model proliferation, rationalisation, environmental, and legal factors

Mr J A Reynhart, executive vehicle engineer (product engineering) for Ford (SA), will then discuss the development and testing of vehicles designed and manufactured for the SA market

"The paper discusses the various types of tests necessary to achieve a high level of engineering confidence prior to the commencement of volume production," explains Mr Reynhart

An address from Prof D G Kröber, of the University of Stellenbosch's Bureau of Mechanical

Engineering, will focus on the performance characteristics of radiators, while a departmental colleague, Mr N J Theron, will talk on *Behaviour of Vehicle Ride and Handling*

"It is very useful, during the design stage of a road vehicle, to predict the behaviour of its suspension system," explains Mr Theron, assistant engineer at the Bureau

"A simulation programme has consequently been developed, which considers only the ride aspect of a rigid-body, multi-axle vehicle

"The results of the simulation are compared with practical measurements made on a real vehicle similar to the model vehicle used in the simulation"

In the last address before lunch Mr J Bester, of General Tyre (SA) Ltd, will talk on tyre design and testing for the SA market

The three addresses after the lunch interval will be devoted to

- The design and development of a light pick-up truck for the SA market (by Mr R Gegus, of Ford)
- The development of a plastic fuel tank (Mr J Smitmerrsell, of Volkswagen SA)
- Automotive fuels in SA (Mr R Seagriff, of Volkswagen SA)





# CANNINNERS LOOK TO FATTER TIMES

INDICATIONS are of the canned produce that the trend towards lower world wide supplies of canned fruit will continue and South African canners are in a position to increase their prices, according to Berne van der Merwe, chairman of the Canning Fruit Board

prospects seem rosier as well thanks to opportunities offered by black consumers

Vaughan Wiles, marketing director of the food and beverage division of Metal Box says efforts to promote the sale of canned products on the home market holds good growth prospects

Currently, South Africans buy 340 million cans a year. On a per capita basis this is only 14

cans per person, compared to the 95 cans per person in the USA

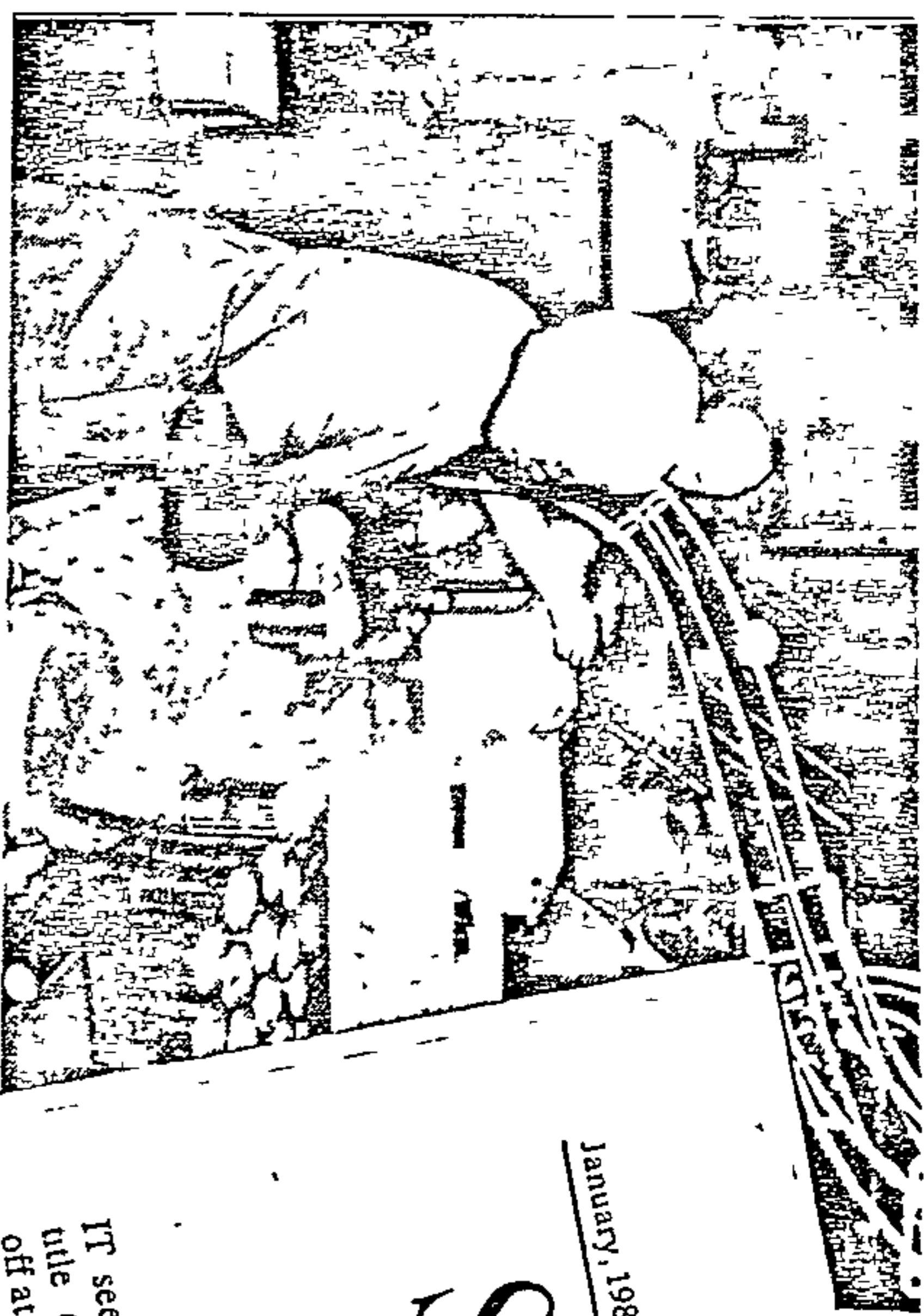
Research revealed though that the black community accounts for about 60% of sales (220 million cans) in South Africa and with an estimated population of 21 million, this represents consumption of only 10 cans per person

He foresees that greater marketing emphasis will be directed towards the black market

But, says Wiles, until the market is better understood 'there is no point in any large-scale promotion'

There are certain generic myths associated with cans, particularly within the black community, says Wiles

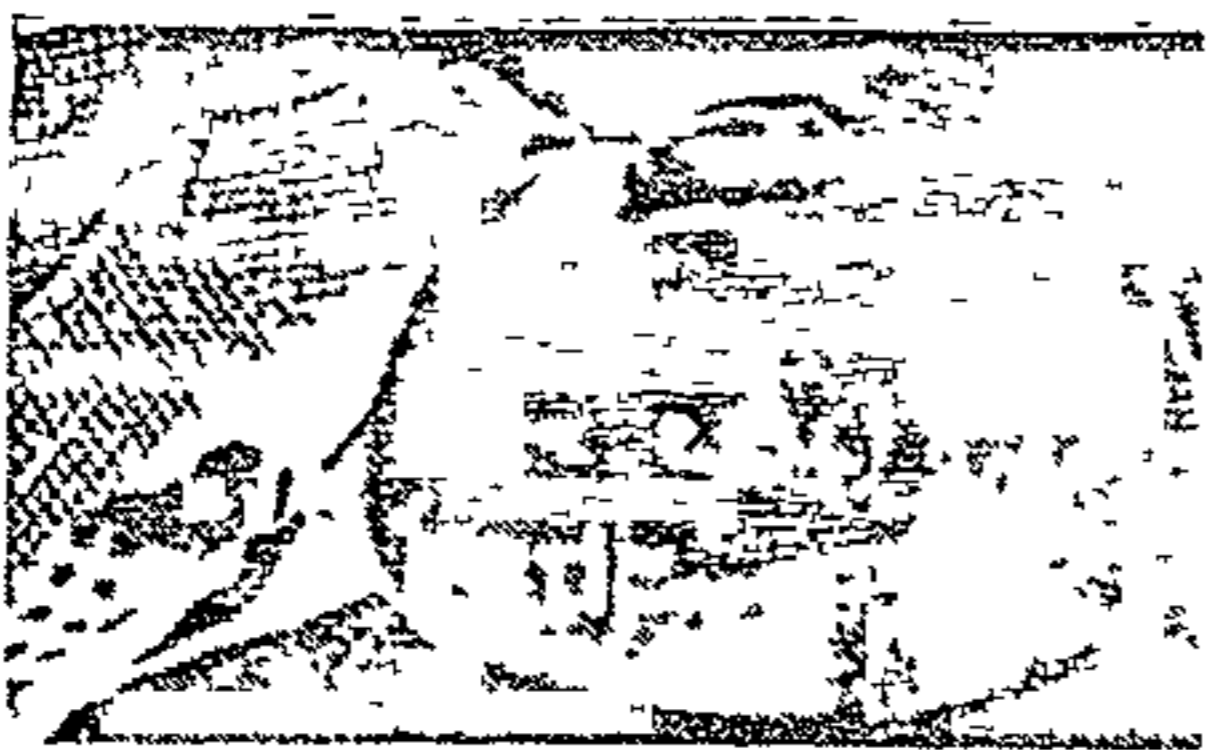
He believes a 'marksmans's' approach should be adopted in approaching specific opportunities. This could result in the formulation of products being changed to conform with specific black market requirements



Fruit canners . . . gearing up for better times

'There are also opportunities for re-directing product perception - jam as a staple in the Black breakfast market for example' Wiles points out

Langeberg has not waited long and has positioned itself this year by increasing prices of canned produce by an average 9 percent. The main reason given is the higher cost of fruit - a ton of the new season's peaches is expected to cost the canner 32% more



Bertie v.d. Merwe



Vaughan Wiles

## SECT

IT seems that sectional offices are taking off at last in Cape Town. The take-off though not on the grand scale envisaged earlier when huge office blocks would have been tiled

The properties - published until now are relatively small developments by 1 put together by developers and developers be sold to specific markets

Developer Pooley was the successfully in Ford Studios in 1 which is now 1 occupation

Most buyers are architects, engineers, surveyors, and professors such as professors

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## Consol warns Cape competitors

LC



# Bar codes make shopping quicker

By GAIL PURVIS

OK BAZAARS has scored a first in South Africa by installing a bar code system for adding up bills at the checkout counter.

It is operational at the OK Homefix shop at Sasolburg

A computer is linked to seven point-of-sale terminals, each equipped with hand-held scanners that read the price of the article from a series of lines printed on the package

The system, costing about R70 000, is part of an order by OK Bazaars for 30 more

More pilot schemes are expected to be installed by OK Bazaars in supermarkets and Hypermarkets next year

"We consider this order to be of very great significance," says the account director, Mr David Goldenstein, of the supplying company, ICL

"It is our first order for this type of equipment and needless to say we are delighted"

SA's first experiment with bar coding systems started tentatively many years ago in the retail clothing business.

More recently bar coding has been spreading to food retailing and supermarket operations

Recently, Knowles Hyperstore, Pinetown, Natal, introduced an NCR 2126 bar-coded, laser-scan-



Queueing at the supermarket check-out. The new system will help to ease situations like this.

ring system with 25 checkout points. It cost about R175 000

Knowles bar coding operates on all fresh food produce. It was installed at the end of November

The Knowles operations director, Mr Norman Leatherington, says "The system has speeded up our checkout points and makes stock control much easier. We will install the system in existing and new stores in the future"

Another retail operation in the field is Buckstons, Umhlanga Rocks. It opted for an ADS bar-coding and laser-scanning system

OK Homefix claims to be the first SA store to have introduced bar coding for all its produce, both for fixed-price items and for goods such as snails, which are sold by weight

A major advantage of bar coding from the consumer viewpoint is that the checkout reading can be done in about two seconds, in contrast to the most skilled operator's manual performance of up to 10 seconds

This helps to eliminate bottlenecks at checkout counters

Another advantage for the consumer is the detailed and itemised cash slip, which allows home-improvers and contractors to budget a job down to the last item

The system has been in operation for several years in the US and UK. It was specifically developed for home-improvement centres and building material suppliers

A major UK user is the Sainsbury group, which has installed

ICL's Handi 25 for control of its Home Care Centres

The OK Homefix system consists of two parts for retail processing and inventory control

OK Bazaars will be able to keep fine control on stock levels and re-ordering

Another computer item gaining popularity with the retailer is the MSI hand-held computer terminal

Launched in SA four years ago by the franchise-holder, Multi-source, this device had a slow beginning

The franchise has gone to Norristan data Systems, the Pretoria-based computer supply subsidiary of Norristan

A large order came recently from Metro Stores, which has taken 152 MSI 85 terminals and an

MSI 2743 receiver-converter unit.

The terminals are to be used for order entry and stock-taking, says Metro's management information services manager, Mr Andrew Reitzer

The MSI units are portable, battery-powered devices. Resembling a hand-held calculator, they record data through the keyboard

The unit can be connected to an ordinary telephone line to transmit information to a host computer. It can also operate through an off-line receiving device

It can link to a printer for output of information

The cost of the hand-held terminals is R1 500 and upwards

Mr Tom Casey, an MSI Data Corporation executive who is in SA to assist Norristan Systems with sales support, says major applications for the terminals are electronic ordering, order entries, stock-taking, route-accounting, meter-reading and asset-tracking.

Mr Geoff Earnshaw, a marketing consultant and editor of "The Retailer" magazine, says recent studies show that between 2% and 8% of all items on sale in food and chemist shops are incorrectly priced.

"Price auditing with the MSI hand-held data collection terminals can help minimise inaccuracies by letting staff confirm prices and shelf status," he says.

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13/12/83

# VW BEEFS UP TRAINING PLAN

By PRISCILLA WHYTE

VOLKSWAGEN of SA has extended its apprentice training scheme.

A training centre was opened by Dr Wolfgang Habel, chairman of Audi NSU of Germany, who was in South Africa for the launch of refurbished Audi range. The VW R1,5m apprentice facility is the first part of the company's R200m expansion programme.

The training centre is the largest in the SA motor manufacturing industry and about 36% of all apprentices in the industry are trained by Volkswagen. SA needs to train 20 000 artisans each year to maintain growth in the motor industry. In 1982 only 14 497 apprentices were indentured.

Dr Habel says training is part of

VW's business philosophy, as shown by the growth in the company's training budget (1980, R0,73m; 1981 R1,3m; 1982 R2,9m; and R3,9m this year).

In 1982 and 1983 the apprentice intake was 100. VW SA employs 300 technical trainees on a full-time basis.

It offers training for motor mechanics, electricians, electronics technicians, die-and-press tool-makers, tool and jig makers, turners, machine fitters, automotive machinists, machine tool mechanics and welders.

Additional training in hydraulics, pneumatics and electronics is offered. VW has 239 000 employees throughout the world and has trained 20 000 young people in Europe, America and Africa.

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## AUTOMATION

# Computing the future

Knowledge, as encyclopedia salesmen are fond of telling us, is power. And management's need for faster and more informed decision-making has never been greater. Large and small computer systems are proliferating as companies use new technology to increase efficiency, production and profits.

A glimpse of how many enterprises will be managed in the future has been provided by a demonstration of new technology by Honeywell. In essence, its new TDC 3000 system allows for total plant management by merging process control, product, planning and business data into a single unified information and control resource. Translated into practical terms, this means that a single operator, seated at a computer terminal, can oversee virtually all the functions of an entire plant.

The terminal is a window through which he can monitor all plant functions — including control, maintenance, administration, and operations. He can control or alter processes, make queries, generate reports and view processes actually taking place. When a light flashes on the display indicating a problem, the operator simply touches an alarm on the screen to obtain information needed to take appropriate action.

All this has some very obvious implications for labour. In fact, the first question that Honeywell management faced at a press conference to launch the new TDC 3000 focused on this issue. Past introduction of new technology which introduced automation resulted in the retrenchment

mainly of unskilled and semi-skilled workers. Will this new system not result in many middle managers being made redundant?

Honeywell's view is that it will enable middle managers to make better use of their time. It seems possible that this response may be questioned by trade unions in some industrially advanced countries where there already is an adequate supply of skilled and trained managers. However, in SA, where according to some estimates the proportion of middle managers to the total number of employees in an enterprise is just under a quarter of that in the US and Europe, the threat of redundancies appears to be minimal.

There is no mistaking SA management's interest in the new technology — and Pretoria Portland Cement will be one of the first companies in the world to install the TDC 3000.

Like many other developments in technology, the TDC 3000 owes its origins to a crisis. Eight years ago Honeywell, through the development of the TDC 2000 system, introduced digital technology to process control. "We started a revolution," boasts Richard de Bono, vice-president of Honeywell (Europe).

It was a time when the full impact of the 1973 oil crisis was being felt. Process industries were struggling to achieve greater efficiency in the face of high energy and raw material costs. For those industries using crude oil as a feedstock — and having to take it from wherever they could get it — the issue was increased flexibility to re-

spond rapidly to changes in crude quality. They were in a position similar to a baker who had to produce bread daily but who was receiving consignments of flour of sharply differing qualities. Such circumstances demanded quick decisions and extraordinarily sharp control at a time when many control functions in the production process still had to be carried out manually.

Process control at the time was a fairly cumbersome process. The operator in the process plant control room was confronted with a mass of analogue indicators and controls. Each process had its own control centre — quite often a control panel many yards long. Many kinds of control calculations had to be carried out manually and complex control strategies were difficult to implement. The TDC 2000 brought to their aid all the power of the microprocessor and the associated digital technology. Complex control strategies could be easily implemented and masses of dials were replaced by the all-purpose video display.

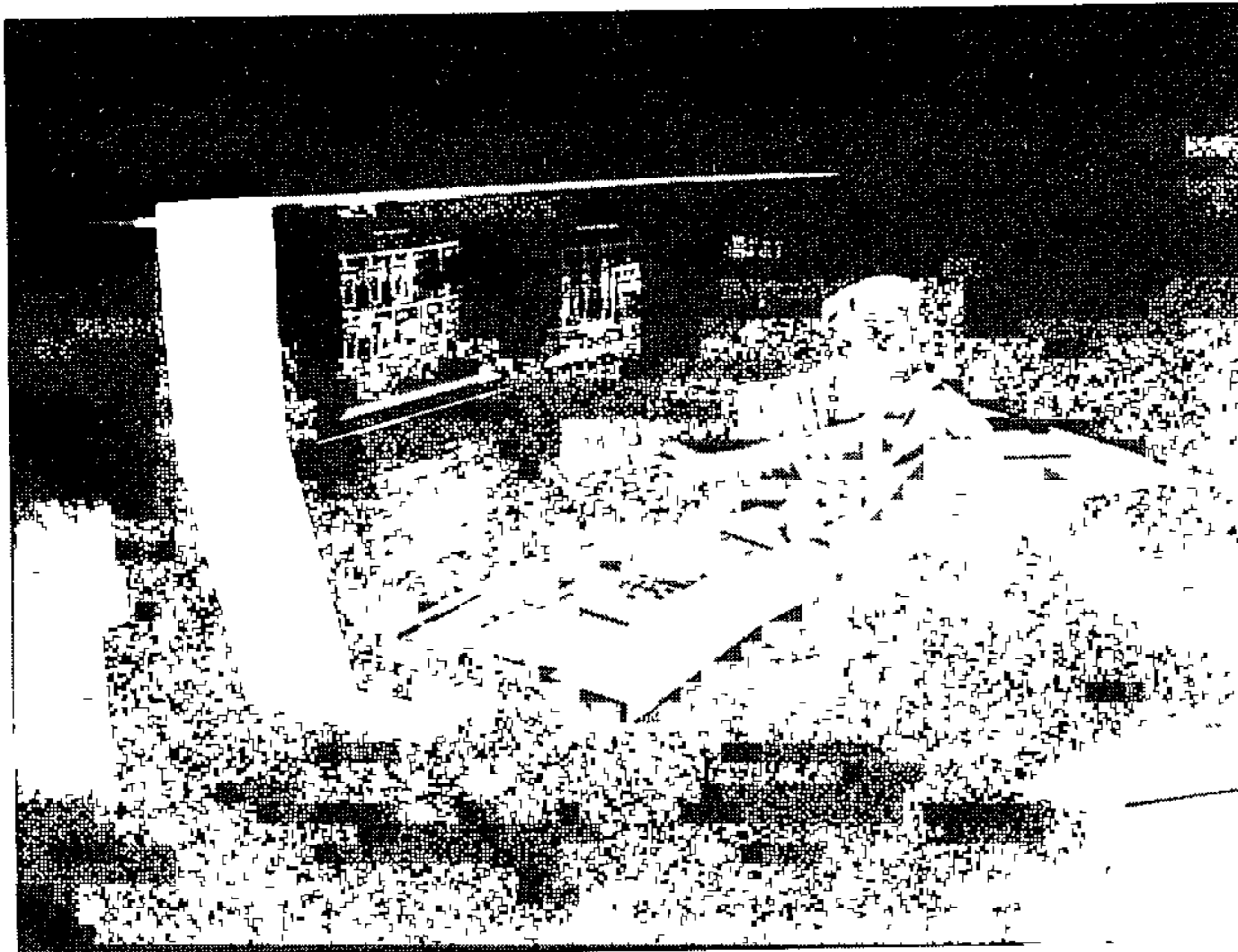
### New complexity

Honeywell applied its technology to solving problems at the heart of the process plant — the process units. The same digital technology has been applied to other areas of the plant by any number of suppliers: to weighing machines, the tank gauging system, to quality control systems, to the boiler room and, of course, to information systems for product movement and storage, manpower scheduling and maintenance.

These systems function independently, but the fact that each has generated useful and perhaps vital information has created a new level of complexity for management to deal with. These systems cannot talk to each other. They were developed by different companies and have their own languages. Some were designed to communicate with management, some with operators, and some with engineers.

The issue now is how to manage all of this in an extremely competitive environment. There is a need, therefore, to integrate information from all sources, and present it in the right form to enable management to implement overall plant business strategies, to make better use of capital investment, and better use of human skills. There is also a need for shorter reaction times to allow market opportunities to be seized.

Honeywell boasts that it can now provide a universal system which reaches into every corner of the plant and, by uniting every aspect of it, open up more possibilities to plant management than either Honeywell or its customers can yet imagine.



New technology ... making total plant management possible

Handwritten scribbles and a circle at the bottom of the page.



# Laser check-outs planned for South African supermarkets

(179A) ROOM 7/10/83

By MIKE JENSEN

MANY OF South Africa's large retail chains plan to introduce laser scanners at check-out desks next year.

OK Bazaars will run a pilot project at its Edenvale Hyperama, while the exclusive Buxtons supermarket, near Durban, has bought the first completely integrated system for automatically adding up purchases at the check-out desk.

Pick 'n Pay has announced it will spend another R5 600 000 on computerised equipment. The group is already the most advanced of the large retailers, with about 70% of its check-out desks computerised.

The system is so advanced that it will be a relatively simple step to add the laser scanners.

A South African company, ADS, has beaten off stiff competition from international subsidiaries to land the Buxtons and OK Edenvale contracts, together worth more than R500 000.

ADS already has 44% of the market for non-scanning electronic terminals. The new contract will give them the lead in a market for scanning systems estimated to be worth over R100m.

The complete conversion of OK Bazaars is expected to cost between R30m and R40m.

Over the next few months, ADS will install electronic point-of-sale terminals equipped to read prices through an internationally recognised bar code attached to each item.

Tellers will simply push the goods over the scanning port to provide the total billing.

Since the terminals will be connected to a central computer, it will be possible to monitor the rate of sale of individual product lines, or calculate shrinkage and profit on a daily or to-date basis.

Mr Ronnie Herzfeld, system development manager for Pick 'n Pay, said "It is defi-



One day it will be quicker to get past those check-outs.

nately the right thing to do, and the sooner the better.

"US experience has shown that the terminals have a pay-back period of between two and three years. But more efficient accounting practices are not the only reason. It is also possible to lower shrinkage at both front and back of the store, while customer throughput is increased by at least 20%."

Mr Trevor James, group information executive for Checkers, said he was "surprised" by the Buxtons development.

He said Checkers believed maintaining credibility with consumers was extremely important.

"If significant pricing mistakes are made early in the introductory period, then there could be a real problem," he said.

"We have no problem with the technology, but there will have to be adequate emphasis on consumer acceptance and the training and discipline of the in-store staff."

The South African Numbering Associ-

ation (SANA) is a joint committee of retailers, electronic terminal suppliers and consumer groups pushing for the implementation of electronic retailing.

Its chairman, Mr Frank Knowles, has emphasised the importance placed on involving consumer groups and the Housewives' League in the process of implementation, and believes there is unlikely to be a problem in this area.

SANA has been negotiating with manufacturers for the introduction of bar codes. The organisation has just completed a survey, which estimates that 50%-60% of all food items will be marked by the end of 1984.

Although there will be a small cost involved in incorporating the bar code on packaging, there will be considerable benefits, especially for manufacturers launching new products. It will be possible for them to introduce a product to selected stores and get an almost immediate idea of the sales.



# Helicopters take the modern role of spraying and less herbicides

*Alan Williams*  
179 AD

IT used to take days, even weeks, of monotonous toil, sluggish machinery and premature grey hairs to get the bugs and weeds before they got the crops

Today, with the help of modern machinery and crack teamwork, crop spraying has become a painless — although slightly more expensive — method of ensuring that little bit extra quality and quantity at the market place each year

Mr Trieme Louw of Diemersdal Farm in the Durbanville area has been using aerial crop spraying methods for several years

**Report:**  
**ALAN WILLIAMS**  
**Pictures:**  
**DOUG PITHEY**

now and says he has never looked back

It used to take me between 10 and 12 hours by tractor, he said but today my entire wheat land of 140 ha takes only two hours using helicopters

Helicopter spraying is a new concept in South Africa although fixed-wing aircraft have been in use for many years

Mr Louw said he preferred helicopters to aeroplanes because he had more direct control over the spraying operation

"I can tell the pilot exactly when and where I want the spray," he said

"It allows me to control the whole process from the ground or by radio"

According to Captain Jeremy Labuschagne, operations manager of Court Helicopters, the wasp-like Bell 47 craft allows far greater manoeuvrability and control than spraying time considerably

The R80 000 helicopters are fitted with two bulbous tanks capable of carrying more than 300 litres of insecticide and can deposit their load at a rate of 30 litres a hectare

For the occasional motorist who stops to watch the helicopter's intricate aerial stunts, the process might seem a simple affair

But it involves considerable skill

and nerve — Captain Stan Botha has, for instance, 22 years flying experience and more than 9 000 hours

Captain Botha, one of the three helicopter pilots in South Africa, begins his day at 6.30 am with a thorough check of his helicopter

If he is lucky he may get home by 9 pm after spraying the crops of two or three farms

He spends more than seven hours a day in the air, six days a week "My wife wants nothing to do with helicopters," he said.

"But I enjoy my work"

His ground crew consists of flight engineer Gustav Bohlmann and assistant Dieter Behm, who are kept busy mixing insecticide in a mobile 1 000-litre tank

They have to be ready to refill the helicopter every three minutes, a task they can complete in under two minutes

Although the helicopters have to fly at speeds of 90 km/h just three metres above the ground all the pilots are proud of their accident-free records

Captain Botha demonstrated one of the few emergency measures available to pilots should they encounter mechanical difficulties while in the air

The procedure is known as "dumping" and involves opening a hatch at the bottom of the tanks to allow the insecticide to drain out

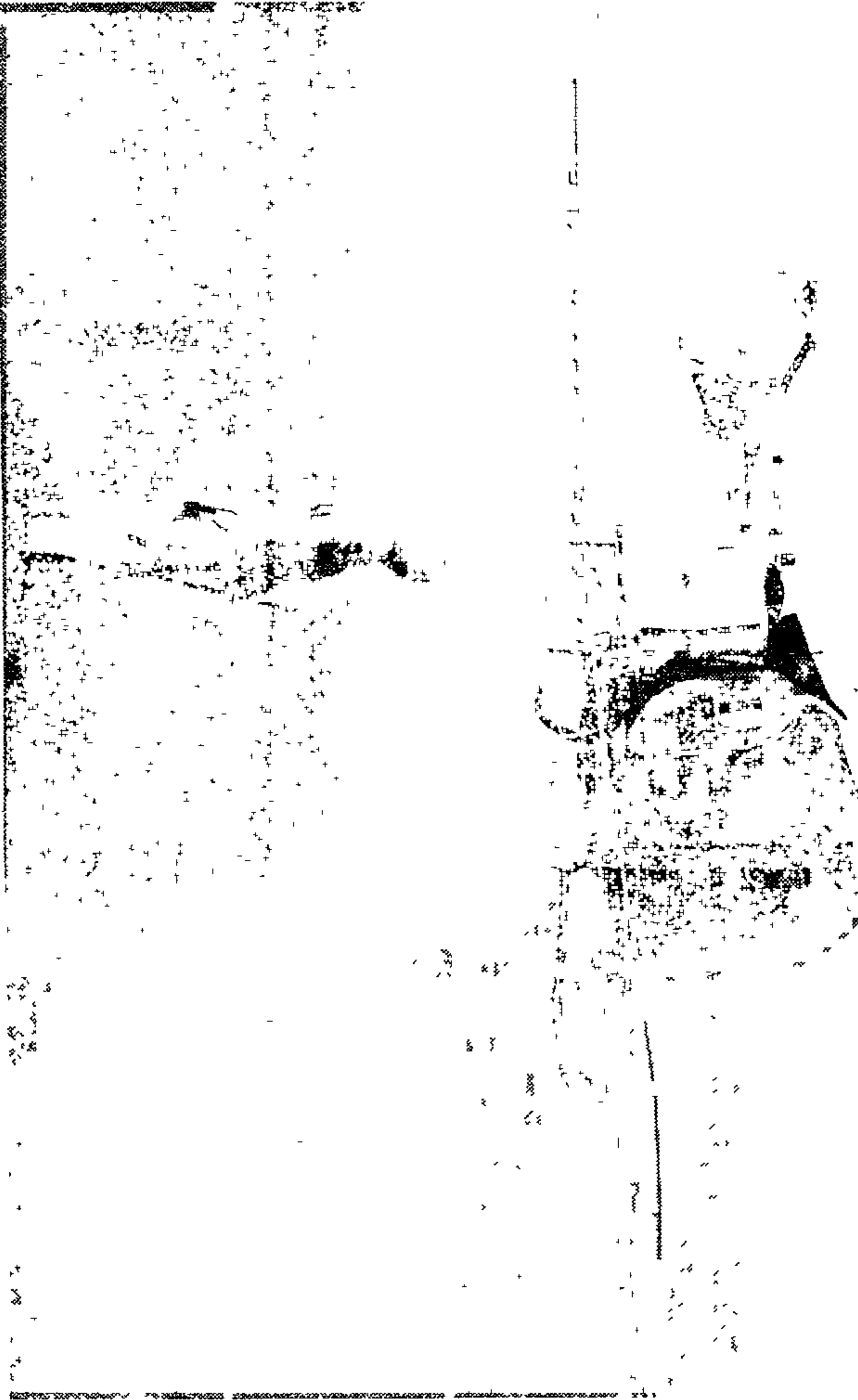
**Weight cut**

This reduces the weight and allows the craft to climb higher if necessary

Helicopter crop spraying came to South Africa only two years ago, although helicopters have been used extensively in agricultural production for many years in countries such as the United States

Captain Labuschagne said that if demand increased in this country, more helicopters would be brought into service.

FLYING at ground level at speeds of up to 90 km/h, the Bell 47 helicopter swoops in trailing a fine mist of weedkiller. The helicopter has to land every three minutes to refill its tanks.



CONCENTRATING on his instruments, Captain Stan Botha gets ready to land and take on another 300 litres of insecticide.



PLOTTING out the area for the next "drop" is Captain Stan Botha, operations manager, Captain Jeremy Labuschagne and Durbanville farmer, Mr Trieme Louw.

we view my way I would do possible job to make workers + so before the application

WEEK 4 JV /  
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MORNING  
MORNING



## ELECTRONIC EDITING

### Busy program

FM 2/4/82

179a



Although most major SA newspapers have begun computerising their editing, classified advertising and type-setting, they remain a prime target market for future sales of computer equipment

In the next five years they should spend R20m on complete pagination systems and further automation. Total value of all terminal-based text processing systems (TBTPS) in SA is now about R22m

Small circulation newspapers and commercial typesetters are another fertile sales area

Perskor is a further sales prospect. It uses the Hendrix system — believed to have come as part of the Citizen package — but for production only

In SA, Atex has 65% of the newspaper market for TBTPS, and has a distribution agreement with SA Associated Newspapers (Saan)

Saan, Nasionale Pers, the *Natal Mercury* and the *Argus* newspaper have bought Atex. But the *Argus* company's *Daily News* and *The Star* are installing the rival CSI system. The *Natal Witness* uses Hendrix

An independent trade journal lists Atex as the largest systems company in the graphic arts business, and fifth largest in typesetting worldwide. It credits Atex with 31 new systems internationally in 1981, including 14 for newspapers. CSI completed

three installations

Atex should benefit from its 1981 Eastman Kodak merger, by getting the picture-processing, chemical and laser technology essential for pagination

Jolyon Nuttall, manager of *The Star*, says CSI was chosen because it suits marketing functions in the classified section

"CSI proved extremely adaptable and upgraded its system to meet our requirements," he says "Atex seemed less flexible"

The Atex system uses a bank of smaller computers while CSI depends on fewer, but bigger machines. But Atex fans believe that having fewer computers is not always an advantage as they may have to be more sophisticated and costly

Nuttall says that after a malfunction, CSI terminals do not go down, the system merely slows as a backup computer takes over

And had Atex been installed, any subsequent refinements would have to be offered to Saan as well, Nuttall says

Atex Systems (SA) GM John Joslin counters that while CSI and Atex work differently, CSI has no special marketing functions. And sales to the *Dallas Times Herald*, the *Houston Chronicle*, *LA Times* and the *Washington Post* — all heavy on classifieds — have gone to Atex or vendors other than CSI

"There was nothing requested by *The Star* which Atex couldn't provide," he says

"Atex is more modular, but we feel this gives greater resilience and reliability. If there is a breakdown you lose 10% of the system rather than 50% on a dual computer system

"We recommend a spare computer so you can switch failed terminals without losing response time"

Replying to other criticism of Atex, he



Atex editing system . . . computerising the journalist

says no buyer can have exclusive use of valuable improvements without paying millions, and as yet no computer vendor has kept a refinement exclusive

John Potter, production manager of the *Argus*, says the *Melbourne Age* has the largest weekend classified section worldwide, and like his paper, has chosen Atex

He says that while CSI may need fewer computers than Atex, a CSI computer malfunction could pose more problems



# Engraving merrill's

## The modern way

# 'dying art', say masons

S. T. 1918  
179K

By MARC DOBSON

IN the words of Port Elizabeth mason Kevin Evans, it's a "dying art"

He didn't intend the pun but monumental masonry (the design and engraving of memorials) is a job that definitely holds little appeal for most young people contemplating a career today

At first glance the job does appear to have few pros. It's arduous and laborious, has potential for being depressing and isn't nearly as remunerative as being a mechanic or an electrician or a bank clerk

At the turn of the century, however, monumental masonry was a respected trade because it demanded a high degree of skill and artistry. But then carvings and memorials in those days were ornate and sometimes exquisite works of art

As the years rolled by, so inflation slowly killed off grandiose graves, ushering in more standardised memorials and encouraging the trade to become increasingly mechanised

Although more and more people are choosing to be cremated nowadays, there continues to be a steady demand for memorials

masonry are still being offered by the larger firms, but applications are dwindling and there is often a high drop-out rate

An apprentice mason trains with his sponsoring firm for three or five years (depending on his experience), in conjunction with studying a course in art and design at a technical college

"Mechanisation has meant that much of the skill has gone out of the job," mourns Mr Evans, who has been a mason for more than 20 years, following in the footsteps of his father and grandfather

"In the old days you could walk around a cemetery and see from the style of inscription who had worked on any one particular memorial"

There are three main methods of engraving a headstone, but the most popular and speedy way makes use of a press machine and a sand-blast

Working on the machine with a three-ply rubber stencil and plastic stencil letters, the mason cuts the rubber deep enough to loosen the letters

He then places the stencil on the memorial stone and removes the stencil's centre-skin. From here the

stone is sand-blasted to eat away the exposed area and then it is plastered, with the letters being painted in silver

The other mechanised method enables the mason to work directly on the stone by use of a letter-cutting machine. It's a slower procedure but a more exact and neater finish is achieved

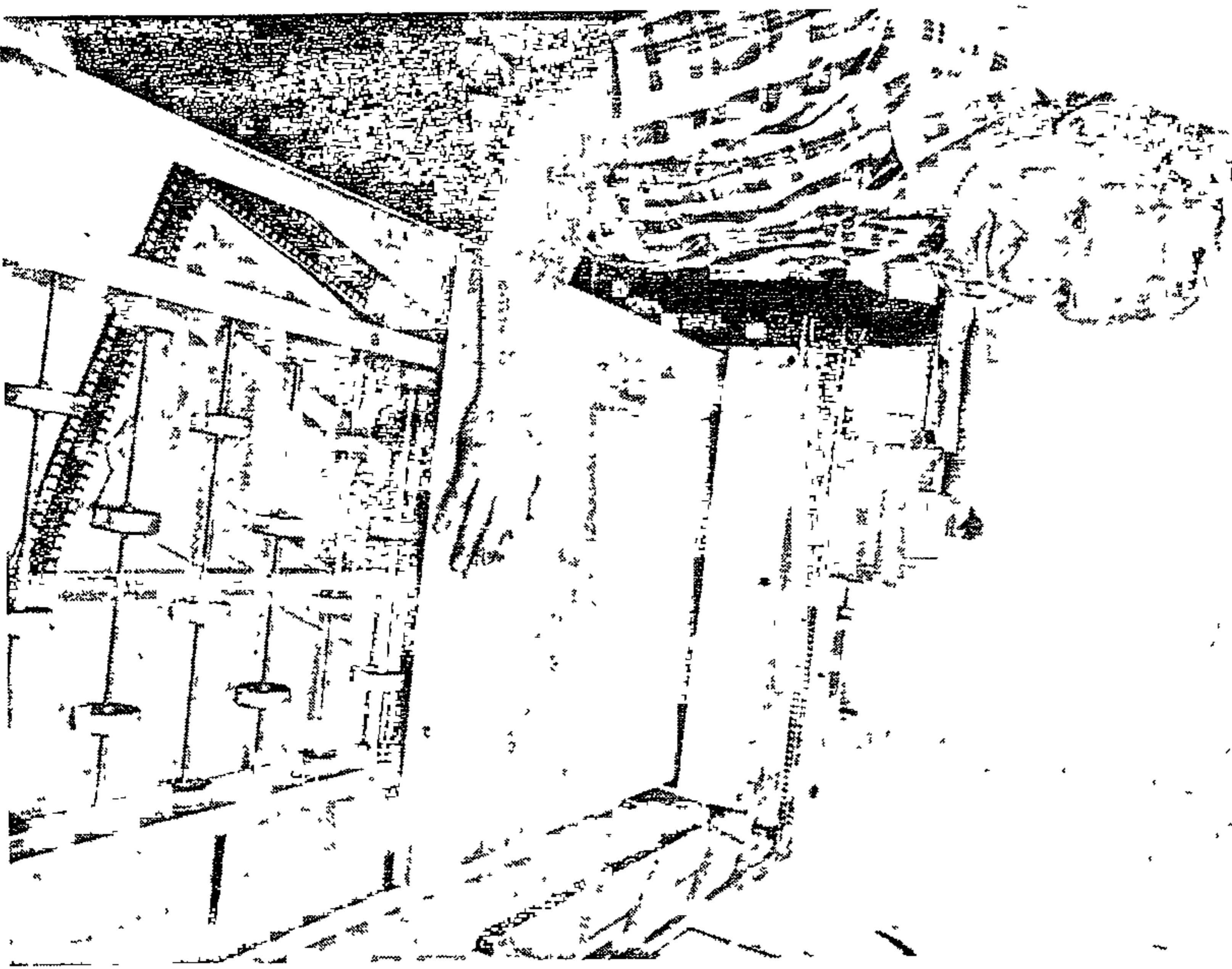
"In masonry you can never rub out, so if you make an error you have to start from the beginning again — which proves expensive," said Mr Evans

The third method is the traditional one, by hand, but today this method is only employed when a memorial is brought in for a second inscription and the two styles have to be matched

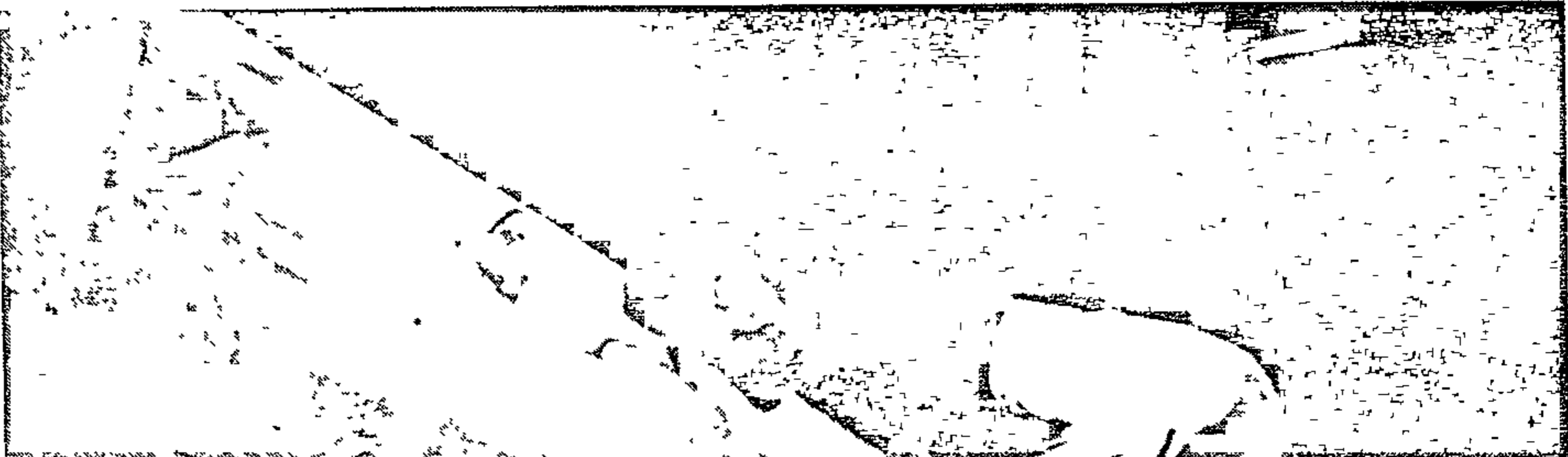
The demand for hand lettering is still strong enough to dissuade master mason Fred Gommersall from retiring

Mr Gommersall, who's been a mason for 54 years and who had intended retiring three years ago, works solely by hand on the more elaborate and expensive memorials

"I've got so much work to do every day I just wish I could take it home with me," he says wryly



The mechanised way... mason KEVIN EVANS operates a press machine to cut the lettering on a plastic stencil, which will be placed on a stone



The traditional way, by hand older, more elaborate memor

# Warning on threat to motor industry

179A  
E. Post  
10/9/83

By FRED ROFFEY

CAPE TOWN — Thousands of workers could be thrown out of work in the motor industries of South Africa and other countries if the West does not meet the threat coming from factories in Japan using a flexible manufacturing system (FMS), which will produce cars for export cheaper than other countries can make them

This warning was given in Cape Town by Mr Martin Bailey, deputy director, of the Materials Handling Research Unit at the University of the Witwatersrand

Speaking at a seminar organised by the South African Institute of Materials Handling, he said factories using an FMS cut cost dramatically by incorporating robotics, horizontal transport systems and automated storage and retrieval systems, all controlled by computer

This flexibility enabled the factory to produce car engines on one day, crankshafts the next and exhausts on the third day and so on — all on one production line and with a minimum of human help

"If South Africa does not set up its own FMS's, we could eventually be importing most of our cars from other countries using the systems, and thousands could be thrown out of work in the South African motor industry," said Mr Bailey

"There are no systems like this at present in South Africa, about 100 in Japan, 100 in the USA, and several in Britain"

"However, South Africa has started to use robots "It is estimated that 30 000 to 40 000 robots will be in use in South Africa in 10 years, many of them in the motor industry"



Star (1799)

# Police

# Warning of

# soaring

# SA computer swindles

By Michael Chester

Police at John Vorster Square today alerted big business to double check electronic security systems to counter a growing wave of computer frauds already causing losses running into millions of rands.

The warning coincided with evidence that the thieves who systematically robbed Sterns diamond stores of jewellery worth R3,8 million over the past two years went undetected because they found a way to tamper with computer records.

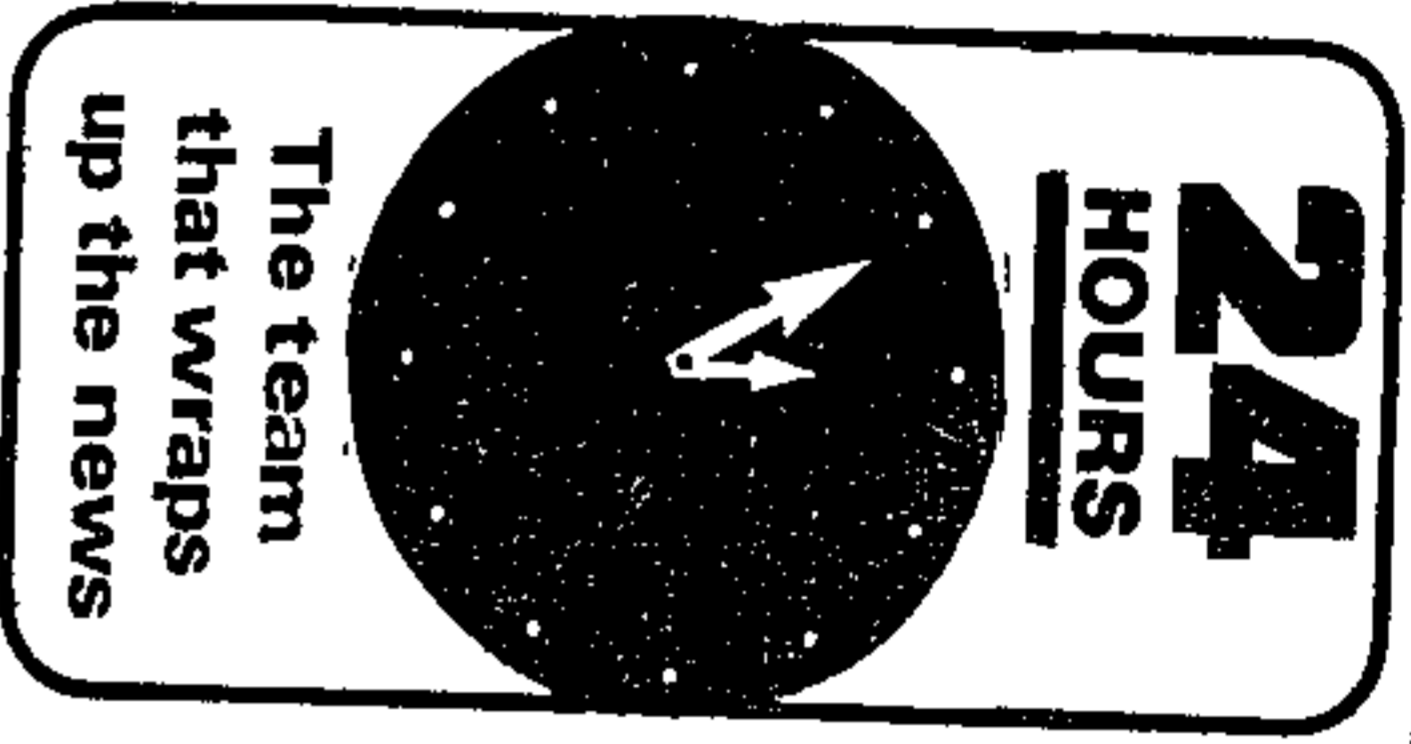
The police are ready to join insurance investigators in trying to unravel the methods used to infiltrate the central computer system and erase all trace of the thefts until uncovered by auditors.

Mr Syd Barnett, chairman of Sterns, fears that one or more of his head office employees in Johannesburg may have been persuaded to orchestrate the computer frauds by an international gang that in turn smuggled the jewellery out of the country.

"We can only hope they somewhere made slips that we can trace for clues about their identity," he said.

Colonel J A Hulme, commander of the CID Commercial Branch in Johannesburg, said computer crime had so far been relatively rare in South Africa. "But we are bound to be hit as the crime wave in Europe and North America reaches here in full force."

Businesses with computer systems were advised to be alive to the dangers of manipulations that easily go undetected without rigorous security precautions.



## Home computers able to tap military and company secrets

The Star Bureau

LONDON — A new film showing how home computers can steal military secrets opened this week in Britain.

"War Games" depicts a teenager using his home computer to gain access to the computer system at the US military command. The stolen information almost starts World War 3.

Screen fiction is now set to become fact, particularly in Britain which has the highest per capita number of home computers in the world.

It could mean that top secrets are stolen, and that millions of rands are electronically transferred from a company bank account into the thief's account.

Last week the first home-based computer crime was revealed. Ten youngsters, aged between 15 and 22, managed to plug into a nuclear

weapons laboratory system in New Mexico.

They found the right access number, which is used as a computer system's password.

Then with a device called a modem, which links computers to the phone system, they relayed information from the laboratory to their home computer. Mr Bill Farquhar, joint author of a new study on computer crime out this month in Britain, has no doubts that home computers will soon be used for massive deceit.

"Existing protection is extremely poor," says Mr Farquhar. "Many companies have no idea how powerful home computers have become, and how little they cost. They also don't appreciate how clever youngsters are at computers."

All that is needed is a medium-sized home computer costing about R500, a TV screen, a phone and a modem. The most difficult part is

finding the access number.

From Milwaukee, Associated Press reports that a group of young computer "raiders" being investigated by the FBI probably are "just the tip of the iceberg" of illegal computer tapping by home equipment.

The FBI says a group of young men calling themselves the "414s" — after Milwaukee's telephone area code — used telephones and home computers to tap computers at New Mexico's Los Alamos Nuclear Laboratory.

No harm was done, the laboratory said. But an attorney for one of the youths said he suspects the pranksters plugged into many more computers nationwide than even the young vets have been willing to admit.

"You wouldn't be far wrong if you took six times a dozen," he added.

The techniques escalate to "superzapping", illustrated by an expert who tapped a computer system from a telephone box and ordered R8 million to be credited to him, and another who switched R1 million to a Swiss bank account.

One management consultant, Mr Leonard Fine, a chartered accountant, has already been called in by 16 companies hit by computer frauds.

Cash losses had ranged from R75 000 to well over R600 000.

A major problem was the reluctance of many victims to report the computer rackets to the police, because they wanted to avoid a public airing of the potential loopholes in their systems which would damage their corporate image.

One Johannesburg insurance expert, Mr Norman Atkins, estimates from studies made by the Geneva Association, an international insurance research unit, that Western Europe is braced for computer frauds and sabotage likely to cost more than R700 million by 1988.

"The stage is also being set here for an increase in incidence and size of such losses," he writes in "Businessman's Law".

Computer technology is often beyond the grasp of top managements, making it easier for operators down the line to manipulate systems.

The computer criminals have already developed a secret jargon for the methods they use.

They begin with the "salami" technique, which involves repeated switches of small sums of cash from large companies which hardly notice minor losses.

An example was a bank employee in the United States who stole fractions of a cent from 300 000 accounts — and augmented his salary by R32 000 a year.

Another computer operator instructed the system to punch out his pay cheque several times every month.



179A

# PW urges re-think on mechanisation

By Frank Jeans

The twin problems of unemployment and inflation are not only a threat to South Africa's economic advance but are also undermining its competitiveness in world markets, the Prime Minister, Mr P W Botha, told business leaders in Johannesburg last night.

Speaking at the National Productivity Institute awards banquet, he urged employers to take a new look at the effects of mechanisation on the jobs situation — because excessive use of the machine could result in less employment which was not conducive to economic growth and development.

"The present high rate of inflation in South Africa compared with other Western countries is affecting our competitive ability in international markets."

Urging "great caution" so as to avoid aggravating the jobless problem, Mr Botha said that

while employers were feeling the effects of recession, it was important that mechanisation should be considered "very carefully at all times, but particularly now".

The three NPI award winners are David Whitehead and Sons, the Natal-based textile company, Sappi Forests, and the Krugersdorp division of Middelburg Steel & Alloys.

David Whitehead's productivity campaign, which began three years ago, has pushed output by its 1 800 workers by more than 40 percent and management is planning export sales of 25 percent.

In line with the production boost, the quality of DW's textiles has also improved.

In reorganising its tree-felling operations since 1978, Sappi in Zululand has raised productivity 160 percent.

The company estimates this improvement in output has saved it more than R2,5 million

over the past four years.

In the face of what is said to be the worst slump to hit the world ferrochrome industry in 50 years, the Krugersdorp team of Middelburg Steel & Alloys maintained profitability at the plant because of its comprehensive productivity measures.

"Despite the slump our performance clearly indicates that we are reaping the benefits of management's commitment to higher productivity at all levels," says Mr Kingsley Edwards, executive director of the Krugersdorp division.

The dramatic results from increased output are seen in the plant's performance figures.

Ten years ago, 39 manhours were needed to produce a saleable ton of ferrochrome. Today, the figure has dropped to fewer than 10 man-hours.

During the same period an intensive safety and loss control at the Krugersdorp factory cut the accident rate to zero.



# 'Robots will not steal jobs'

By Hannes Ferguson

(179A) Star 28/5/84

The introduction of robots into car factories would in no way increase unemployment, says Mr Thomas Horne, Ford Sierra programme manager

He said in Port Elizabeth that his company had not laid off a single worker after the adoption of automated welding and similar techniques.

They represented the last pre-robot stage of automation. As the trend continued, jobs would still be safe. Automation represented inevitable progress in car-making know-how.

An automated body-work welding clamp could make 22 car bodies an hour, while the old manual clamping and welding technique yielded only six.

The next step, on which Ford SA had not yet taken any decision, would be to replace follow-up manual welding by robots.

The fixed automatic welding clamp could make one model of car body only, but robots, being more versatile, could be programmed to weld any model.

This would increase productivity even further.

South African production runs were short, however. Ford at Dagenham, in the UK, produced



When the jaws of this giant clamp close a battery of welding guns automatically puts the car's bodywork together.

890 Sierras a day, Port Elizabeth only 120, so in South Africa there was less scope for automation.

But having automatic tools meant quality levels could be much improved by working to very narrow tolerances. Robots would strengthen this trend.

Automated tooling also made

it easier to control quality by computerised statistical measuring of operations.

In the Sierra programme, electronic quality control dovetailed into the automated production line.

Eventually, other South African Ford plants would follow suit.

Better technology, better quality, higher productivity and more prosperity for all went hand-in-hand, Mr Horne said.

Mr Peter Fleming, manager of the ASEA Robot Application Centre in Bedfordview said robots as well as related automatic equipment improved productivity, made things cheaper and increased wealth.

## STATE PROTECTION

In a dynamic and demand-oriented economy they must therefore create and increase employment.

ASEA was a Swedish-based company which supplied about 20 percent of the world robot market.

A development economist said the creation of urgently needed jobs for blacks depended in the first instance on state protection being given to labour-intensive industries producing for the home market.

Greater sophistication in engineering and other potentially export-oriented industries, using capital and knowledge intensive technology, could only strengthen the home market and create much needed growth momentum.

**Banking interest**

Standard and Barclays banks are eyeing a challenging but lucrative R20m/year market for computer processed weekly payrolls. They have not yet declared any intention to enter it, but their moves are being closely watched by the R100m computer bureau industry, which fears a threat to its livelihood

Both banks already process about 500 000 monthly salaries on behalf of corporate clients. But the service they perform could be extended from a pure banking service into data processing of salaries and wages

Potential gains for the banks are more accounts, both corporate and personal — particularly from black clients

Where companies employ enough people to justify the cost, automatic teller machines (ATMs) could be installed on company premises, enabling employees to withdraw their earnings at their workplaces

It would further stimulate use and acceptance of ATMs, which banks consider far more cost effective than human tellers. It could also encourage many employees who use shopfloor machines to open accounts in the bank concerned

Standard Bank GM Bill Jones says he can justify an ATM on a transaction rate of 4 500-5 000/month. If everyone drew all their money every week, a company with a workforce of 1 000 would be the minimum to justify an ATM

Use of automatic tellers would greatly ease the banks' entry into the market. Without ATMs, the economic viability could be less favourable. As one banking source notes, most weekly-paid workers like cash, and handling of cash is a costly, security-intensive business

If the banks could persuade weekly-paid workers that a banking account (which can

be credited weekly through the Association of Clearing Banks) is as good as cash then they could succeed

Bureaus contend that if banks carry out such plans in addition to Standard's and Trust's offerings of microcomputers linked to the banks data bases they will be impinging on ground traditionally held by bureaus. And they fear that, to win market share, the banks will undercut already competitive prices and use the weekly service as a loss leader for other financial services

The industry body the Computer Services Association (CSA), intends taking up the matter with the banks to determine their intentions

Its main worry — and Jones concedes it — is that Standard "is not going into the bureau business to make money out of being a bureau"

Indeed new accounts may not be the primary object. All the banks have a lot of computer capacity which they have installed to power on-line inquiry systems and ATM networks. Much of that equipment is idle at night and its cost effectiveness could be improved if it was used to process weekly payrolls and do other batch jobs

Banking sources maintain that payroll processing is merely another service they can offer. Barclays has a committee investigating the issue. John Pickering, assistant

GM of Barclays' Customer Computer Services division, says "If we can provide a service equal to or better than (computer bureaus), we don't see why we can't get into it". Pickering and Jones admit that their present payroll operations are not profitable, but Pickering points out that Barclays almost broke even this year

One company that could get hurt is Fidelity Guards (FG) which makes up many of SA's pay packets. Colin Fourie, FG's financial manager says "The banks could end up changing the nature of the cash-carrying business. Instead of filling and delivering pay packets FG will have to fill up the ATMs"

However Fourie believes the banks may struggle to get the scheme off the ground. He points to UK figures which show that 40% of workers there are still paid weekly in cash. There is similar resistance to change among black workers in SA, he believes

Nedbank and Volkskas say they are not yet considering offering a weekly payroll service in addition to their existing monthly service but both add that their systems could be expanded if the need arises

Clearly for the banks the idea represents a desirable step towards the cashless society they've been seeking for years

Shifting funds electronically from a corporate account into the company's employees' accounts will be technically easier

when the ATM switch (which will link most banks and building societies, is installed later this year (*Business March 4*). Then it will be a relatively simple task to let retail outlets, such as supermarkets and department stores use the network for direct debiting of sales transactions — if the Post Office allows it



ATMs and complain that they cause unemployment. Sasbo officials say an Australian union has even gone to the extent of paying for television advertisements that encourage people to use tellers and not the machines.

For Sasbo, however, the threat of unemployment is not necessarily the most pressing problem, because of the shortage of skilled manpower in SA. But the union does fear this could be a threat in the future. One of the most immediate concerns is the fact that the level of seniority a bank employee can achieve in a branch is often determined by the number of people employed at the branch.

The union's fear is that if ATMs reduce the number of people working at branches, the number of responsible positions available to bank employees may diminish. In addition, it wants to ensure that people who operate the machines are adequately paid.

"We appreciate that the banks must be competitive — we are not fools," says the union spokesman. "But we want to know what they intend doing and would like to be part of the planning."

AUTOMATION FM 13/5/83

## Bank workers worry

SA's bank employees are becoming distinctly uneasy about the introduction of automatic teller machines (ATMs). Banks may soon face demands for the protection and compensation of employees affected by automation.

"Increasing automation is a major concern," says a spokesman for the SA Society of Bank Officials (Sasbo). He points out that hundreds of ATMs have already been installed by SA banks and many more will be introduced within the next few years. On the agenda for the union's biennial branch conference is a resolution calling for a probe into possible detrimental effects of automation.

Banking employees' unions in Western nations are similarly perturbed about

179A

E Post

5/5/83

# Steel-collar car workers that are 'semi-intelligent'

THE worker slowly picks out a metal letter from the box in front of him, looks at it and after careful consideration places it next to the other five on the platform to spell the word "people"

Nothing strange perhaps - except the worker has only one arm stands one metre high and is made of steel

Such semi-intelligent robots were the stars of the recent Hanover Trade Fair and they are heading a revival in West German demand for steel-collar workers

Euphoria over robots in the early 1970s, after their introduction at Volkswagen and Daimler-Benz car plants, quickly evaporated in the face of vast technical difficulties and high development costs

But the new breed of robots is capable of more intricate tasks. Companies see these steel servants both cutting costs and increasing flexibility and productivity in the face of tough competition

The number of robots employed in West German industry has trebled in the past two years to about 3 500 and this rapid growth has led experts to raise their estimates of 1985 usage to 7 500 from the previous 4 500

Purchase prices remain high although experts say a DM200 000 (DM = mark)

**Increasing automation in motorcar manufacturing and in other industries has been held out as an increasingly realistic option to labour unrest. In this report from the Hanover Trade Fair in West Germany, ROBERT WOODWARD outlines the enormous technological advances that have made robots a major factor in cutting costs and raising productivity.**

(R85 000) loading and unloading robot will pay for itself within 1½ years

Most West German robots are installed in the car industry where they are ideally suited both for monotonous, back-breaking work such as welding and body assembly and potentially-dangerous tasks like spray-painting

Their takeover of so-called "dirty" jobs is popular with workers and has short-circuited attacks from trade unions who had feared widespread job losses after the arrival of robots

"A robot can at present hardly do more than a blind man with thick gloves, leading robot expert Mr Hans Warnecke says reassuringly

But unions are unlikely to be so passive in the face of the new "semi-intelligent" generation of robots prototypes of which were on show in Hanover

Robots are currently pre-programmed with a computer to undertake cer-

tain tasks which they can carry out fast and accurately 24 hours a day, seven days a week

However, problems can arise when for instance, the joint to be welded is slightly out of place and the robot merrily welds a hole in a wing mirror

Ford will introduce a new generation of wheel-mounting robots this year capable of finding the position of hub bolts with computer-linked sensors and then power-screwing the wheel onto them

Researchers are also developing even more advanced sensors like those on the 'people' robot. These will discern via touch and infra-red sensors, whether the robot can carry out a particular task and if it is completing the task successfully

There is already one robot for every 500 workers in the car industry and IG Metall the industry's union, fears the new breed will either cause redundancies or

mean displaced workers are forced to undertake more menial tasks

Economists estimate around 600 000 of West Germany's one million assembly workers have unskilled jobs which could be taken by robots. Robot manufacturers believe union fears are exaggerated and say their industry has a key role as an employer - the current workforce of 14 500 is expected to climb to 20 000 by 1985

They add that many firms, and jobs, are saved by increased efficiency following robot installation. But the unions point to Japan, where car workers are increasingly disturbed by the number of robots in industry. Japan has 11 robots for every 10 000 workers compared with less than three in the US and West Germany

Nissan's 47 000 employees have forced the company to agree not to sack anyone after robot installation. Additions to the firm's 700 robots will now be

allowed only with union consent

West Germany's robot producers are also closely watching Japan as they fear falling sales in the Far East and US could lead to a Japanese offensive on the European market

Japan has about 13 000 robots in operation at present, at least double that of any other country. But the turndown in the car industry has forced Japanese producers to slash prices to inflate sales, experts say

West German producers admit that Japanese firms have a larger research and output potential. They also complain that stringent safety regulations and the power of unions in West Germany are inhibiting robot use

But firms here are rapidly catching up in the field of robot technology due partly to a series of joint ventures with Japanese firms. Hitachi recently linked up with the West German Zeppelin company, while the large Siemens group is developing "multi-sensor" robots with Fujitsu Fanuc

However US experts say the Japanese are expected to increase direct marketing of their products soon and to start buying up small European robot firms - Sapa Reuter



FM 10/6/83  
ELECTRONIC BANKING

## Out with the old . . .

Such is the pace of progress that the United Building Society (UBS) is already withdrawing about 80 obsolete money machines from supermarkets

They are to be moved to remote UBS agencies which do not have automatic teller machines (ATMs), says GM Mike de Blanche

Unlike the sophisticated ATMs which dispense cash and communicate with clients on a screen, the supermarket machines merely provide vouchers which can be used to pay for goods in the store

"We now have about 330 ATMs installed with one close to most supermarkets," says De Blanche "The ATM provides cash after hours, so there is no need to continue having machines in stores"

He believes the only system which could improve on the ATM for supermarket purchases is the point-of-sale (POS) payment facility which will directly debit customers' accounts when goods are paid for at the check-out

This will eliminate handling of cash and paperwork while providing built-in security — but it won't be available for some time

However, De Blanche says the present supermarket machines, installed as fore-runners to ATMs, performed a useful service in helping improve public awareness of electronic banking They were also relatively inexpensive at about R2 000 apiece against R30 000 for an ATM

# Automated factories cannot be ignored

12/7/83  
179A Industrial Week

THE THEME of the materials handling exhibition in Chicago this year was the automated factory - a factory operated and run without human assistance

Imagine a typical automated factory supplied from an automated storage system by automated guided vehicles

Several computer-controlled machine tools fed by robots and guided vehicles. One hundred percent quality inspection

By Martin Bailey

done by "seeing" robots and a final product fully assembled, packaged, moving direct to storage without the help of human hands

## Skilled

Of course we shall need skilled humans to program the computer controlling the automated factory, and maintenance personnel to keep the equipment in good order

With a bit of clever planning in our automated factory we can attempt to eliminate work in progress, and coupled to concepts such as "group technology" - the grouping of similar machines together - and "materials requirements planning", we could have a really efficient factory

## Design

The design, of course, will be done on one of the many Computer Aided Design (CAD) systems. We can then program the computer to produce a complete set of instructions for a machine tool centre and pass these instructions across to the machine tool when required

We then have information flow direct from the designer to manufacture

## Perfect

This all sounds like it has the makings of the perfect factory, but there are a few problems

What about money? A factory such as this may be extremely efficient, but it is going to need considerable capital invest-

ment. Are we likely to find companies in SA prepared to invest in this type of technology?

## Labour

Our local labour may also object to the concept of the automated factory, and may feel threatened by the looming thought of total redundancy. We are even likely to find resistance from engineers who are frightened of all this new technology

It seems the Japanese and Americans believe the automated factory is here to stay. Soon, automated factories will make themselves felt as real influences on sagging productivity in manufacturing environments

## Forced

If nothing else, we in SA will be forced to compete with products produced in these factories. Products which, by all account, will be cheaper, of better quality and produced with very short lead times

The future, therefore, looks bleak for SA manufacturing if we cannot adapt to such trends, and counteract them with improved technology suited to local conditions

Martin Bailey is the deputy director of the Materials Handling Research Group at the University of the Witwatersrand. This is his ninth article for Industrial Week







The new Anglo American publishing

Systems July 1983

179A

# Computers vital to Anglo project

From the special company site of this project, about 8100 which enhances the layout of hard copy schedules. The initial path only drew the curtain wall sections of the original design drawings from Hour City, New York before sending them for

Mark Devenney, "people who run systems like ShareNet on this basis are depriving software suppliers of revenue"

Val Greenstein on the USA According to Montgomerie, once the utilities are linked they only require one floppy disk unit between them to load the software onto the Novell's disk

## SN gets huge response

This is the first edition of SA Software News which will be published monthly by Systems Publishers. The title of the newspaper has received an overwhelming response to the first issue and advertising responses can be seen in this issue to be considerably higher than in other editions.

Other objectives of the publication are to provide a vehicle for recruitment and a reference service through the software listings from Systems Publishers' databank. In addition Software News will feature a software catalogue section which will provide low cost advertising to software suppliers. The purpose of the catalogue is to ensure that potential software buyers have access to information on both new and established software products.

• To Page 2

# The ABC of CPIL

## P

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## C

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## O

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## ARNING

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-o-o will consider  
y other reports on  
hor of the report are

Dieter Schaefer "on a Univac FCS-EPS can  
convert its binary into symbolic data files in an IBM  
readable format"

# Computers vital to Anglo project

• From Page 1

reliant on its computer  
software "We do an  
average of 130 to 150  
drawings a month and we  
don't have a draughts-  
man. An ex-typist  
operates the system"

Anglo American  
Properties tracks the  
progress of the overall

project using a system  
designed by BD Consult-  
ing which run on an  
Apple II "The system  
expedites the overall job  
control" said Rana  
Strudom who acts as  
'expeditor' or chaser for  
the project

Ove Arup & Partners  
structural engineering  
consultants designed the

concrete structure with  
standard software devel-  
oped by Ove Arup in  
London

John Abbott project  
engineer at Ove Arup told  
Software News "We take  
responsibility for the  
concrete structure and we  
share responsibility with  
the designers for the  
curtain wall

"Because of the novelty  
of the curtain wall  
construction in this  
country more people have  
been asked to participate  
in the checking of the  
design

According to Norman  
Linsor product adminis-  
trator for Otis elevators  
the high speed computer  
used lift is the first of its  
kind to be installed in this  
country. It moves at 4m a  
second (800ft a minute)

from the UK when it is  
developed and support  
by EPS Consultant  
which has offices through-  
out the world. The system  
is available on a wide  
range of micros, minis  
and mainframes including  
the IBM range from the  
PC upwards. Other ver-  
sions supported are Data  
General Prime HP  
Burroughs Wang Apple  
Sirius Sharp Superbrain  
North Star and Onix

"FCS-EPS is written  
for each machine inde-  
pendently, to bring out the  
features of that specific  
machine" explained  
Lauder

Univac FCS  
convert its  
into symbolic  
a IBM-readai

The tape is  
then be read  
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"The  
and 'writ  
variety of  
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files is possi  
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ter

World we  
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networks



Jacqueline Lauder "secret of con-  
specialisation"

Fourth Generation application develop-  
ment environments will demand a truly  
on-line, multi-threaded, high perfor-  
mance, relational, DBMS as their  
foundation.

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12 Sept	User Friendly and Languages	29 August	Heather W
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PK645 4/8/83

NATIONAL/INTERNATIONAL

# Botha: Do not aggravate unemployment

179A

Argus Correspondent  
PHETORIA — The Prime Minister, Mr P W Botha, has made an urgent appeal to employers and employees' organisations 'not to aggravate the unemployment problem'

At the National Productivity Awards ceremony in Johannesburg last night, Mr Botha said the creation of sufficient job opportunities was not the responsibility of the Government alone

'The private sector and, more particularly, employers and employees, must also play their part,' he said 'For this reason I wish to make an urgent appeal to employers and employees' organisations to exercise great caution so as not to aggravate the unemployment problem'

Mr Botha said he believed the effects of mechanisation should enjoy particular consideration at present  
'An excessively high rate of mechanisation in individual establishments can result in less employ-

ment' This could occur particularly with unskilled and semi-skilled labour and would not necessarily contribute towards productivity improvement  
"This is not something we can afford," he said

## Inflation

South Africa's high rate of inflation compared with other Western countries was undermining its competitive ability in international markets, said Mr Botha

"This is not conducive to economic growth and development and the creation of more employment opportunities"

Mr Botha warned that South Africa could not continue to deprive herself of an important instrument at her disposal, namely productivity

"It is unhealthy, for instance, that labour productivity in the manufacturing sector last year went down by two per cent, while earnings per worker rose by approximately 20 percent"

# Robots march in

179 A

It is time for SA manufacturers to take a long, hard look at robotics, says Professor Mike Rodd, head of Wits' electrical engineering department and director of Wits' MechaTronics research at the university's Science Park.

Already, around 50 000 industrial robots are being used worldwide, about 60% of which are in Japan SA has around 40 installed, while Australia, which is thought to be about five years ahead of SA in robotics, has about 500

The term "robot" is misleading, says Rodd. "It infers that a machine will step in and do the job, while we advocate flexible manufacturing systems (FMS) which incorporate robots and other technologies."

Robots are intelligent automated machines, able to integrate several separate automatic processes because they are able to "talk" to one another as well as to a central computer

The ultimate function of robots is for them to be easily programmed to perform several different tasks

FMS starts in the design process with computer aided design (CAD) and computer aided manufacturing (CAM) systems. This information is transmitted electronically to computers that will perform such tasks as materials requirement planning, production scheduling and inventory control Costing and timing of making goods is also worked out by computer.

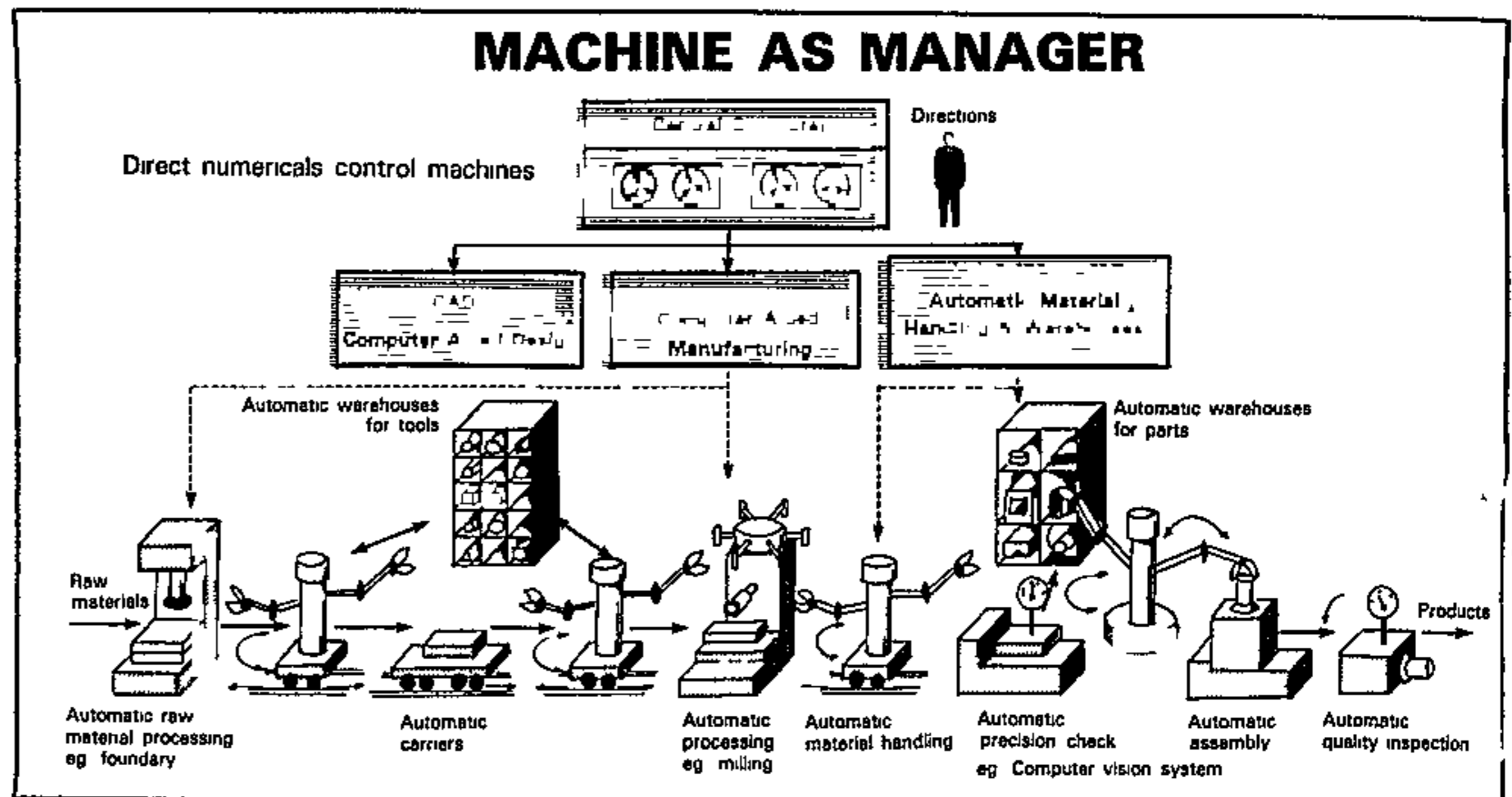
The MechaTronics centre is using robots from Hampo for contract research for paying clients SA Breweries has commissioned the centre to study the feasibility of introducing robotics for loading and unloading of beer crates, and this could be extended to handling and refilling empty bottles.

The centre's aim is to establish a full-scale experimental FMS, with lathes, milling machines and robots together with laser gauging equipment, vision systems ("seeing" robots) — all would be integrated by a computer network.

According to Peter Fleming, manager of Asea Electric's robot applications centre, prices of popular electric-driven robots have dropped about 30% over the last decade. In 1976, an arc welding robot cost around R100 000, and it now sells for between R60 000 and R70 000 Less popular hydraulic-driven robots prices have remained static or increased

SA's motor industry is the biggest user of robots, with vehicle component suppliers next and sheet metals manufacturers and heavy engineering firms following close behind

Most of SA's robots are used for limited applications such as spot and arc welding, and spray-painting, while worldwide, they



are used extensively for assembly, machine loading/unloading, palletising and "packaging."

In SA, most manufacturing takes place in the job-shop and small-batch areas Several manufacturers employ relatively few people, operate as small units, and generally have limited product runs and a large range of products.

According to Rodd, manufacturers in SA have a relatively small market, and it is not surprising that many industrialists are predicting that SA's manufacturing industry is in a perilous condition because of cheap imports.

"Unless the situation is reviewed carefully, many industries will die Even today, we have the trend towards closing local factories and importing products from the East"

Rodd points out that SA's low productivity levels are demanding a fresh approach to the problem. "SA is not the only country that has slipped behind, but among Western nations, is only surpassed in its low produc-

tivity level by New Zealand Countries like Turkey, Spain, Portugal, Greece and others have better levels. Belgium and Norway have figures which are more than 4,5 times higher than SA's.

"If SA has an increase in productivity of 5% a year above that of the US, it will take more than 30 years to reach the US level of performance."

It has been established that robots will take over semi-skilled repetitive-type functions. Rodd predicts that people in this sector will be transferred either to unskilled jobs or upgraded to skilled jobs

According to figures from the US Bureau of Labour, in 1980 there were 542 000 machine tool operators in the US, and by 1990 this should drop by 12% because of robot installations. Machine set-up workers totalled 65 000 in 1980, and this number should drop by 24%, while the number of tool and die makers will drop by a similar percentage from its 170 000 in 1980

However, the bureau calculates that



Robot worker ... grasping the future



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numbers of electricians (300 000), computer technicians (63 000), electrical engineers (300 000) and industrial engineers (185 000) will increase by 28%, 93%, 27% and 26% respectively.

However, the introduction of robots also means a change in the type of components and the number of components that are built into goods. Unless this is done, robots are often not used to full capacity.

Rodd says that where robots have been introduced in SA, they have not come in with a change in component design.

"It's necessary to cut down on the number of components in the goods, and this is usually achieved by introducing more advanced micro-electronic parts which are also made by robots," he says.

"It's not feasible to merely slot in a robot using the old design"

He reckons that most resistance to robotics comes from management, because of the large capital outlays involved "This is typical of the short-sightedness of manufacturing in SA.

"Management often tends to use overseas trade union reluctance to robotise as a hedge, but we've dealt with the Trade Union Council of SA (Tusca), and found them receptive to the idea."

### AUGUST VEHICLE SALES

CARS							CARS						
	1983	% of	1984	% of	1984	% of		1983	% of	1984	% of	1984	% of
	Jan-Aug	Market	Jan-Aug	Market	Aug	Market		Jan-Aug	Market	Jan-Aug	Market	Aug	Market
<b>Toyota</b> .....	<b>36 071</b>	<b>20,19</b>	<b>40 782</b>	<b>20,55</b>	<b>4 734</b>	<b>24,76</b>	Daimler	45	0,03	15	0,01	—	—
Corolla	22 640	12,67	23 842	12,02	2 652	13,87	Other	14	0,01	—	—	—	—
Cressida	13 288	7,44	16 549	8,34	2 042	10,68	Lancia	79	0,04	112	0,06	10	0,05
Other	143	0,08	391	0,20	40	0,21	<b>Aug total</b> .....	<b>19 119</b>	<b>(18,74% down on 23 528 last year)</b>				
<b>VW</b> .....	<b>23 398</b>	<b>13,10</b>	<b>20 225</b>	<b>10,19</b>	<b>1 603</b>	<b>8,38</b>	<b>Jan-Aug total</b> .....	<b>198 423</b>	<b>(11,08% up on 178 626 last year)</b>				
Golf/Jetta	12 200	6,83	9 898	4,99	574	3,00	<b>Jul total</b> .....	<b>20 123</b>					
Passat	8 224	4,60	6 740	3,40	722	3,78	<b>LIGHT COMMERCIALS</b>						
Audi	2 965	1,66	3 581	1,81	307	1,61	<b>(Up to 5 000 kg)</b>						
Other	9	0,01	6	0,00	—	—							
<b>Ford</b> .....	<b>23 369</b>	<b>13,08</b>	<b>29 803</b>	<b>15,02</b>	<b>2 807</b>	<b>14,68</b>							
Escort	10 579	5,92	11 725	5,91	1 190	6,22							
Cortina	10 291	5,76	80	0,04	—	—	<b>Toyota</b> .....	<b>22 577</b>	<b>30,39</b>	<b>25 704</b>	<b>30,26</b>	<b>3 608</b>	<b>38,26</b>
Granada	2 499	1,40	1 853	0,93	183	0,96	<b>Nissan</b> .....	<b>19 771</b>	<b>26,62</b>	<b>16 630</b>	<b>19,56</b>	<b>1 814</b>	<b>19,23</b>
Sierra	—	—	16 145	8,14	1 434	7,50	<b>G M</b> .....	<b>8 914</b>	<b>12,00</b>	<b>15 648</b>	<b>18,42</b>	<b>1 620</b>	<b>17,18</b>
<b>Amcar</b> .....	<b>21 126</b>	<b>11,83</b>	<b>24 388</b>	<b>12,29</b>	<b>2 053</b>	<b>10,74</b>	<b>Ford</b> .....	<b>10 378</b>	<b>13,97</b>	<b>10 727</b>	<b>12,63</b>	<b>1 008</b>	<b>10,69</b>
Mazda 323	13 966	7,82	8 890	4,48	756	3,95	<b>VW</b> .....	<b>7 051</b>	<b>9,49</b>	<b>7 582</b>	<b>8,93</b>	<b>639</b>	<b>6,78</b>
Mazda 626	459	0,26	9 695	4,89	716	3,75	<b>Amcar</b> .....	<b>4 532</b>	<b>6,10</b>	<b>7 562</b>	<b>8,90</b>	<b>607</b>	<b>6,44</b>
Colt Galant	3 260	1,83	433	0,22	61	0,32	<b>Leyland</b> .....	<b>453</b>	<b>0,61</b>	<b>406</b>	<b>0,48</b>	<b>70</b>	<b>0,74</b>
Peugeot (All makes)	2 005	1,12	1 907	0,96	192	1,00	<b>Alfa</b> .....	<b>327</b>	<b>0,44</b>	<b>422</b>	<b>0,50</b>	<b>43</b>	<b>0,46</b>
Tredia	1 430	0,80	3 379	1,70	325	1,70	<b>Renault</b> .....	<b>188</b>	<b>0,25</b>	<b>229</b>	<b>0,27</b>	<b>12</b>	<b>0,13</b>
Other	6	0,00	84	0,04	3	0,02	<b>Mercedes-Benz</b> .....	<b>92</b>	<b>0,12</b>	<b>34</b>	<b>0,04</b>	<b>10</b>	<b>0,11</b>
<b>Nissan</b> .....	<b>20 131</b>	<b>11,27</b>	<b>18 823</b>	<b>9,49</b>	<b>1 732</b>	<b>9,06</b>	<b>Aug total</b> .....	<b>9 431</b>	<b>(12,31% down on 10 775 last year)</b>				
Skyline	7 784	4,36	5 757	2,90	467	2,44	<b>Jan-Aug total</b> .....	<b>84 944</b>	<b>(14,35% up on 74 283 last year)</b>				
Langley/Pulsar	7 551	4,23	11 447	5,77	1 130	5,91	<b>Jul total</b> .....	<b>9 271</b>					
Stanza	2 446	1,37	20	0,00	3	0,02	<b>MEDIUM COMMERCIALS</b>						
Laurel	2 016	1,13	1 407	0,71	89	0,47	<b>(5 001 kg to 7 500 kg)</b>						
280 ZX	92	0,05	90	0,05	8	0,04							
Other	242	0,14	102	0,05	35	0,18							
<b>Mercedes-Benz</b> .....	<b>14 873</b>	<b>8,33</b>	<b>18 253</b>	<b>9,20</b>	<b>1 973</b>	<b>10,32</b>	<b>Amcar</b> .....	<b>2 111</b>	<b>81,26</b>	<b>2 020</b>	<b>43,89</b>	<b>170</b>	<b>35,27</b>
Honda	6 634	3,71	7 387	3,72	573	3,00	<b>Toyota</b> .....	<b>124</b>	<b>4,77</b>	<b>1 070</b>	<b>23,25</b>	<b>148</b>	<b>30,17</b>
Mercedes-Benz	8 077	4,52	10 706	5,40	1 388	7,26	<b>Nissan</b> .....	<b>—</b>	<b>—</b>	<b>1 041</b>	<b>22,62</b>	<b>122</b>	<b>25,31</b>
Other	162	0,09	160	0,08	12	0,06	<b>Mercedes-Benz</b> .....	<b>315</b>	<b>12,13</b>	<b>424</b>	<b>9,21</b>	<b>37</b>	<b>7,68</b>
<b>GM</b> .....	<b>14 408</b>	<b>8,07</b>	<b>16 138</b>	<b>8,13</b>	<b>1 377</b>	<b>7,20</b>	<b>Ford</b> .....	<b>39</b>	<b>1,50</b>	<b>43</b>	<b>0,93</b>	<b>5</b>	<b>1,04</b>
Rekord/							<b>Leyland</b> .....	<b>9</b>	<b>0,35</b>	<b>4</b>	<b>0,09</b>	<b>—</b>	<b>—</b>
Commodore/Senator	4 701	2,63	8 169	4,12	698	3,65	<b>Aug total</b> .....	<b>482</b>	<b>(7,11% up on 450 last year)</b>				
Ascona	5 231	2,93	4 726	2,38	356	1,86	<b>Jan-Aug total</b> .....	<b>4 602</b>	<b>(77,14% up on 2 598 last year)</b>				
Opel Kadett	4 472	2,50	3 237	1,63	323	1,69	<b>Jul total</b> .....	<b>528</b>					
Other	4	0,00	6	0,00	—	—	<b>HEAVY COMMERCIALS</b>						
<b>BMW</b> .....	<b>7 923</b>	<b>4,44</b>	<b>11 461</b>	<b>5,78</b>	<b>1 311</b>	<b>6,86</b>	<b>(7 500 kg and over)</b>						
5 Series	6 287	3,52	2 465	1,24	187	0,98							
7 Series	1 621	0,91	1 536	0,77	140	0,73							
6 Series	6	0,00	5	0,00	—	—	<b>Mercedes-Benz</b> .....	<b>2 206</b>	<b>23,98</b>	<b>2 349</b>	<b>24,61</b>	<b>284</b>	<b>24,89</b>
3 Series	9	0,01	7 440	3,75	984	5,15	<b>Magnis</b> .....	<b>1 297</b>	<b>14,10</b>	<b>1 446</b>	<b>15,15</b>	<b>191</b>	<b>16,74</b>
Other	—	—	15	0,01	—	—	<b>G M</b> .....	<b>1 230</b>	<b>13,37</b>	<b>1 231</b>	<b>12,90</b>	<b>147</b>	<b>12,88</b>
<b>Alfa</b> .....	<b>7 646</b>	<b>4,28</b>	<b>7 613</b>	<b>3,84</b>	<b>572</b>	<b>2,99</b>	<b>Leyland</b> .....	<b>1 072</b>	<b>11,65</b>	<b>908</b>	<b>9,51</b>	<b>124</b>	<b>10,87</b>
Super	353	0,20	460	0,23	26	0,14	<b>Toyota</b> .....	<b>815</b>	<b>8,86</b>	<b>1 166</b>	<b>12,22</b>	<b>112</b>	<b>9,82</b>
Sprint	301	0,17	89	0,05	8	0,04	<b>Ford</b> .....	<b>847</b>	<b>9,21</b>	<b>587</b>	<b>6,15</b>	<b>81</b>	<b>7,10</b>
Giulietta	1 910	1,07	789	0,40	42	0,22	<b>MAN</b> .....	<b>591</b>	<b>6,42</b>	<b>509</b>	<b>5,33</b>	<b>60</b>	<b>5,26</b>
Export	1 621	0,91	532	0,27	50	0,26	<b>Amcar</b> .....	<b>317</b>	<b>3,45</b>	<b>543</b>	<b>5,69</b>	<b>40</b>	<b>3,51</b>
Alfa 33	—	—	1 866	0,94	142	0,74	<b>Int Harvester</b> .....	<b>264</b>	<b>2,87</b>	<b>201</b>	<b>2,11</b>	<b>29</b>	<b>2,54</b>
GTV	276	0,15	156	0,08	13	0,07	<b>ERF</b> .....	<b>148</b>	<b>1,61</b>	<b>163</b>	<b>1,71</b>	<b>23</b>	<b>2,02</b>
Super Turbo	—	—	1	0,00	—	—	<b>Malcomess-Scania</b> .....	<b>141</b>	<b>1,53</b>	<b>222</b>	<b>2,33</b>	<b>21</b>	<b>1,84</b>
Fiat	272	0,15	11	0,01	—	—	<b>Vetsak</b> .....	<b>174</b>	<b>1,89</b>	<b>136</b>	<b>1,43</b>	<b>18</b>	<b>1,58</b>
Daihatsu	2 797	1,57	3 639	1,83	289	1,51	<b>Hestair</b> .....	<b>—</b>	<b>—</b>	<b>46</b>	<b>0,48</b>	<b>7</b>	<b>0,61</b>
Other	116	0,06	70	0,04	2	0,01	<b>Fodens</b> .....	<b>33</b>	<b>0,36</b>	<b>38</b>	<b>0,40</b>	<b>4</b>	<b>0,35</b>
<b>Renault</b> .....	<b>6 361</b>	<b>3,56</b>	<b>10 019</b>	<b>5,05</b>	<b>916</b>	<b>4,79</b>	<b>VSA</b> .....	<b>5</b>	<b>0,05</b>	<b>1</b>	<b>0,01</b>	<b>—</b>	<b>—</b>
Renault 5	3 828	2,14	2 958	1,49	253	1,32	<b>Oshkosh</b> .....	<b>61</b>	<b>0,66</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>
Renault 9	33	0,02	7 026	3,54	661	3,46	<b>Aug total</b> .....	<b>1 141</b>	<b>(10,65% down on 1 277 last year)</b>				
Other	2 500	1,40	35	0,02	2	0,01	<b>Jan-Mar total</b> .....	<b>9 546</b>	<b>(3,75% up on 9 201 last year)</b>				
<b>Leyland</b> .....	<b>3 320</b>	<b>1,85</b>	<b>918</b>	<b>0,46</b>	<b>41</b>	<b>0,21</b>	<b>Feb total</b> .....	<b>1 094</b>					
Jaguar	72	0,04	209	0,11	27	0,14							
Rover	1 200	0,67	205	0,10	—	—							
Range Rover	121	0,07	70	0,04	4	0,02							
Mini	1 789	1,00	307	0,16	—	—							



## Computer views

179A

# Helping workers overcome their fears of computers

DO you sweat, want to vomit, feel dizzy, or feel your blood boil when you are confronted by a computer? If so, don't worry. You are among the five percent who really suffer from computerphobia.

And there are more people who suffer from it than you might think, says Mr Sanford Weinberg of St Joseph's University in Philadelphia.

Mr Weinberg tested managers and college students who use computers regularly for computerphobia, and found a third showed symptoms of the fear, while five percent showed all the symptoms of classic phobia — nausea, dizziness, sweating and high blood pressure.

Mr David Cossey, director of the Wharton Computer Centre at the University of Pennsylvania, adds there are many "closet computerphobics" who hide their fear because of peer pressure to extol the virtues of computers.

As the computer becomes more and more a part of daily life, so people are having to deal with them in their various shapes, sizes and attributes.

Computer psychologist Mr Shoshona Zuboff of Harvard, who specializes in finding ways to smooth the relationship between humans and computers, says some of the social costs of computers are "an altered relationship with co-workers, less worker control and initiative, and frustration because of the intangibility of computers."

Most at risk are executives and managers. A study by Booz Allen and Hamilton, the respected United States management consulting firm, found that at least 90 percent of American executives are computer "illiterates".

The firm believes older executives are less recep-

tive to computers than younger ones as are those who have stayed in a single job for a long time.

But, they say, resistance to computers has no correlation to your education level.

The reason executives fear computers is not hard to find. Typing, the most common way of getting into the computer, is seen as an "unfit" occupation for managers, beside which few have learned to type. In addition, even the simplest electronic spreadsheet program can take a week or more to learn.

Another is the fear of somehow messing up the system and causing the computer to "crash". The competitive element with younger whiz-kids who cut their teeth on the school computer is another major factor. The boss's image of himself as the all-knowing leader, but who knows less than his secretary about how computers work is also at risk, thus undermining his ability to "be the boss".

### Information conveyors

Some executives fear the computer's speed in showing up mistakes. As one observer notes, "The computer does not sugar-coat errors." Others fear, with due cause, that the computer could be an unsafe depository of the company's valuable information.

Middle managers especially fear that the computer could replace them since in many cases they are mainly information conveyors which could be short-circuited. But perhaps a more real concern is that they fear the computer will diminish the interpersonal skills which got them to the top in the first place.

Whatever the real or imagined benefits of computers, a recent national study by the Roper Organiza-

tion showed that most United States workers believe that it is the companies and not the employees which benefit from computerization.

But computers are a fact of life and we are all going to have to come to terms with them. US researchers believe that there can be a relatively painless way to introduce them to the bosses. (They add that that workers usually have computers thrust upon them.)

The researchers suggest that you introduce managers to the computer slowly, starting with calculators and video games. Build up their confidence and expertise with private individual lessons.

The Boston First National Bank set up a walk-in computer centre for managers only where they could have private coaching. And some US hotels have put in computer rooms for guests where they can learn the latest machines and software packages.

Executives should also be involved in planning the corporate computer systems since this makes them take decisions and thus in turn gives them a feeling of control and ownership of the systems.

Some companies allow staff to take the computers home at night so that they can play with it in less stressed surroundings.

Others are trying to change the role of the manager from being information-intense ("Where are those numbers?") to stress leadership and decision-taking activities ("Jack, I'd like you to do this").

If the programme proves successful, you might have to deal with the other side of the coin — that of the computer maniac whose enthusiasm, virtuosity and obsession with things computer can drive away the mildly interested and competent.



# Mondi's answer to high-tech manning

Star

26/9/84

199A

## R2-m school simulates real-work conditions

Financial Staff

Keeping pace with the commissioning programme at Mondri's R600 million Richards Bay pulp and linerboard mill is an intensive staff training scheme which is turning out people with the skills to run the high technology plant.

Because of the specialised technology involved, Mondri has used control instrument simulators to train about 300 key personnel. Cost of training during the mill preparation and start-up phase is already more than R2 million.

The training centre, which is adjacent to the mill construction site, will be a permanent feature, says personnel manager Mr Paul Smith.

It will be registered so that specific standards can be set that will be to the advantage of other companies in the Mondri group.

Part of the training programme is centred on specially constructed simulator control rooms in which operators get theoretical and practical training on the high technology systems being installed at the mill.

An international training consultancy for the pulp and paper



industry, Blanz & Co of Finland, has been brought to South Africa to help Mondri's team in highly specialised areas.

Mr Smith says people of all races from around the country have been recruited for training.

"In the first instance we recruited people with previous experience in the pulp and paper industry or the chemical industry. From early next year, we

will be in a position to start training selected candidates from the Richards Bay area."

In the non-technical field the centre has run courses for semi-skilled and unskilled workers in industrial relations, tax systems, safety, security, fire prevention and first aid. Courses are being planned for language and numeracy and basic business concepts.

Trainees, after simulator instruction at the Mondri training school, test their newly-acquired skills in the control room of the pulp and board mill. From left, Mr Ricky Marmuthu, Mr Michael Pilloy, Mondri shift supervisor Mr Bertie van Schalkwyk and Mr Per-mual Padayachee

EV



# industry's case rescue operation

...as poses a continual threat of mass immigration to the cities with the attendant problem of housing and inadequate facilities"

The sugar industry played a vital role in stabilising the rural population. Some 20 000 black farmers were involved in the sugar industry, 150 000 workers directly, 150 000 dependants

"Additionally, Natal is one of the highest employment rates in the country. Without the sugar industry the economy of Natal would shrink dramatically

"Many ancillary activities such as transport, engineering, general commerce and industry would collapse with a further adverse effect on the labour market"

Mr Smeaton said the 1980s had been disastrous, with drought in 1983-4 it was the worst in living memory and low world prices

"I would point out that this industry has had no drought assistance other than Land Bank loans to certain farmers. This industry is deserving of better treatment by government"

The vice-chairman of the association, Dr C van der Pol, said the financial situation of a great number of individual sugar growers and millers was precarious to say the least"

Private borrowings had reached record levels and balance sheets in many cases had been weakened to the point of insolvency

While the industry was still working, unlike some other parts of the agricultural industry, it had not mean there was no hardship

The industry was earning an income — but this was not enough to cover operating costs as well as the cost of interest — now R47m a year — on borrowings

"The cash flow is negative and one may well be worse off than those who have no crop"

Dr Van der Pol said the industry's main problem was in the export market where low prices ruled and the collapse of the international talks meant that a recovery was unlikely for some time

Low prices did not stimulate increased consumption, as in many countries consumption had reached saturation and others, where it might be possible could not afford the foreign exchange to import

Dr Van der Pol said that at current world prices, sugar could compete with maize as animal feed and chemical feed stock, and no doubt some of the 40 million tons of surplus sugar would be sold to these markets. He added "Not a single country can produce sugar at present prices on a full cost basis" — DDC

(179A) ~~179A~~  
D. Ripstein  
27/7/84  
Motor assembly robot for EL

BY TOM LOUW  
Business Editor

EAST LONDON — CDA in East London, assemblers of Mercedes and Honda vehicles, have ordered their first industrial robot

The new machine is due to be installed on the Honda assembly line next week. Its function is in application of hot melt bonding adhesive and the suppliers, Arc Engineering-Robotics of Wadeville, Johannesburg, say it is the first of its type in South Africa

The machine, costing approximately R70 000, is the latest and most sophisticated of its type available, combining design and technology from Honda and Arc Engineering. It has recently been installed on the Honda assembly line in Japan

The Robotics national manager at Arc, Mr Terry Rosenberg, says the robot will be used for the precision application of a hot adhesive to the outside edge of Honda windscreens prior to installation on the assembly line

By using the machine, the adhesive can be ap-

plied in exact quantities within an accuracy of 0,1 mm and at extremely high speeds. This will result in savings in time and material and costly cleaning operations

A spokesman for CDA comments that the robot converts a messy, unpopular job into one that requires supervision of the machine's operation by a human operator. This upgrades the quality and job content of the assembly worker's task, and at the same time enables the assembly line worker to handle the job more effectively and efficiently and to produce a consistently higher quality of performance

## Meat prices

PRETORIA — Meat prices in East London Market on the 25th July were

BEEF (120) super A 239 2 grade A1 234 5 grade A3 180 9 prime B 218 8 grade B1 217 8 grade B2 210 0 top C 204 9 grade C1 198 9 grade C2 200 6 grade 3 188 1

MUTTON (381) prime B 292 4 grade B1 286 0 grade B2 286 1 top C 289 8 grade C1 283 9 grade 3 263 7

LAMB (423) super 291 4 grade 1 291 2 grade 2 280 6 grade 3 269 2

PORK (43) super RT 271 2 X 258 3 grade 1Y 277 6 grade 2Y 259 0 sausages 250 1

GH

## Toyota T-U-V range

# NOW!

# A BETTER THAN EVER WORKHORSE.

## Still at a basic price.

T-U-V now has an advanced new  
4 stroke engine power and acceleration

Am  
AT  
Ang  
Ape  
Cly  
Maf  
Nah  
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# Unions do not see <sup>179A</sup> <sup>few</sup> computers <sup>24/7/84</sup> as threat

By Stan Kennedy

The computer revolution is making some people wealthy, some people poor and many others nervous.

Mr Ilya Bahar, director of Industrial Engineering, National Productivity Institute, said in an interview that Western trade unions — even the most radical ones — were still undecided about their attitudes towards computer applications.

"By no means can one say that the growing computer applications in all sectors of Western economies has met with strong worker resistance. Their actions are in no way comparable to that of the Luddites in 19th century England, who broke machines to resist the introduction of new technology."

In fact, it is uncommon to hear of computerisation projects which have led to large-scale redundancies.

## PRODUCTIVITY

Mr Bahar said people should distinguish between applications where the computer is meant to increase output and those where it is meant to reduce inputs, like labour.

In manufacturing software, the emphasis is to increase productivity of capital instead of productivity of labour.

There are computer applications which do replace workers, such as in robotics, or reduce the human input required and labour costs, such as in word processing. These are applications directed towards increasing labour productivity.

A study done at Birmingham University, England, showed that only 2.6 workers were replaced by robots. In contrast, the extra manpower needed for maintenance and supervision was between 0.25 to one worker per robot.

"The undesirable effect in the South African context is that such applications may impose higher requirements on the scarce skilled workforce at the expense of abundant unskilled workers.

"The South African manager has a more difficult task than his Western counterpart in approving a computer application. His social responsibility for employment creation might be contrary to his endeavour to increase productivity in his company.

"It is only when there are unquestionable productivity and profitability improvement prospects that such projects should be approved."

He said South Africa must keep abreast of technological developments and not depend on overseas sources. There was a large unemployment pool and workers had to be trained to acquire technological skills.

"We may be forced to progress more slowly with computerisation but our economic structure will be more secure," he said.

## BUSINESS

# More robots necessary for industry to stay competitive

(179A) Stan  
26/6/84

By Stan Kennedy

While the world's robot population currently exceeds 30 000 units and is increasing by 7 000 a year, South Africa has only 30 modern electronically controlled robots in use in the industrial field

But of late, South African industrialists have awakened to the fact that they cannot remain competitive against the rest of the world unless they employ more productive resources to perform key manufacturing functions.

To the uninitiated, robots are seen as a threat to jobs but, in most instances, they have been used in a variety of applications which are often considered unsuitable for humans.

Robots are ideal for highly toxic areas, spot welding, monotonous repetitive assembly tasks, high temperature and polluted areas and areas where exact repetitiveness enhances quality and cuts down on scrap rates.

Above all, a robot is a skilled operator, one which does not need rest breaks, does not complain about working conditions, does not strike and will work quite happily through three shifts

Asea Electric Africa, recognising the need for South Africa to become more competitive, has opened a robot application support and training centre in Germiston, in conjunction with Esab

International, the world's largest welding company.

It is equipped with the latest systems from the small multi-purpose to spot welding and materials handling robots

The development of micro-processors in the late '60s, combined with the already established electro-mechanical robots, created a new era for productivity improvement.

Sophisticated integrated circuits have since become available and today there are robots that can do complex functions with high precision

There are also units that have visual capability which can identify ranges of components at random for assembly purposes

Mr Peter Fleming, the centre's man-

ager, says ease of programming is a vital factor when choosing a robot.

"As well as saving time, there is the extra benefit that training in programming in certain makes is not complicated and the company benefits in not having to depend on highly skilled technicians to programme them

"Computer control programmes for specific purposes have been developed, which make programming easier, as the total computer control of the process can be acquired

"In the arc welding process, for example, it is standard practice to programme voltage, current, arc boost, ignition, crater fill, pre- and post-gas flow parameters from the programming unit."



Asea's IRB 90S robot for spot welding being put through its paces at the opening of the company's robotic centre.



# They may be a floor under falling productivity

By Rob Soutter

The introduction of robots into industry is sparking fears of mass unemployment — but it could be the solution to the inflation riddle, saving democracy from financial chaos.

Mr Dan Moore writing in the Futurist, a magazine specialising in future trends and forecasts, said robots would put a floor under the steadily falling productivity of human labour.

One of the main causes of inflation was a steady rise in wages without a corresponding increase in productivity, he said.

"This leads to more money chasing the same number of products, forcing the prices of goods higher — a move which prompts further wage increases which are not earned."

The vicious upward spiral of inflation could not be broken in the present system without harsh economic measures which were not usually acceptable to the electorate.

Apart from destroying financial stability and creating fears for the future — particularly for the aged — a high inflation rate endangered the political system, he said.

"In the 10 years from 1963, of 40 countries with a higher than 15 percent inflation rate, 38 abolished their democratic institutions in some way."

With the failure of democracies to solve inflation and gain financial security, voters looked to the promises of a benevolent dictator, he said.

"But the advent of thinking machines introduces a new element which can cut the inflation spiral and help save democracy."

These machines were increasing in efficiency and flexibility while decreasing in cost every year. They could work 24 hours a day, 365 days a year with no strikes, hangovers, minimum wage laws, fringe benefits or lunch breaks.

By replacing human labour with robots, productivity could be greatly increased without

# Robots

# could

# save

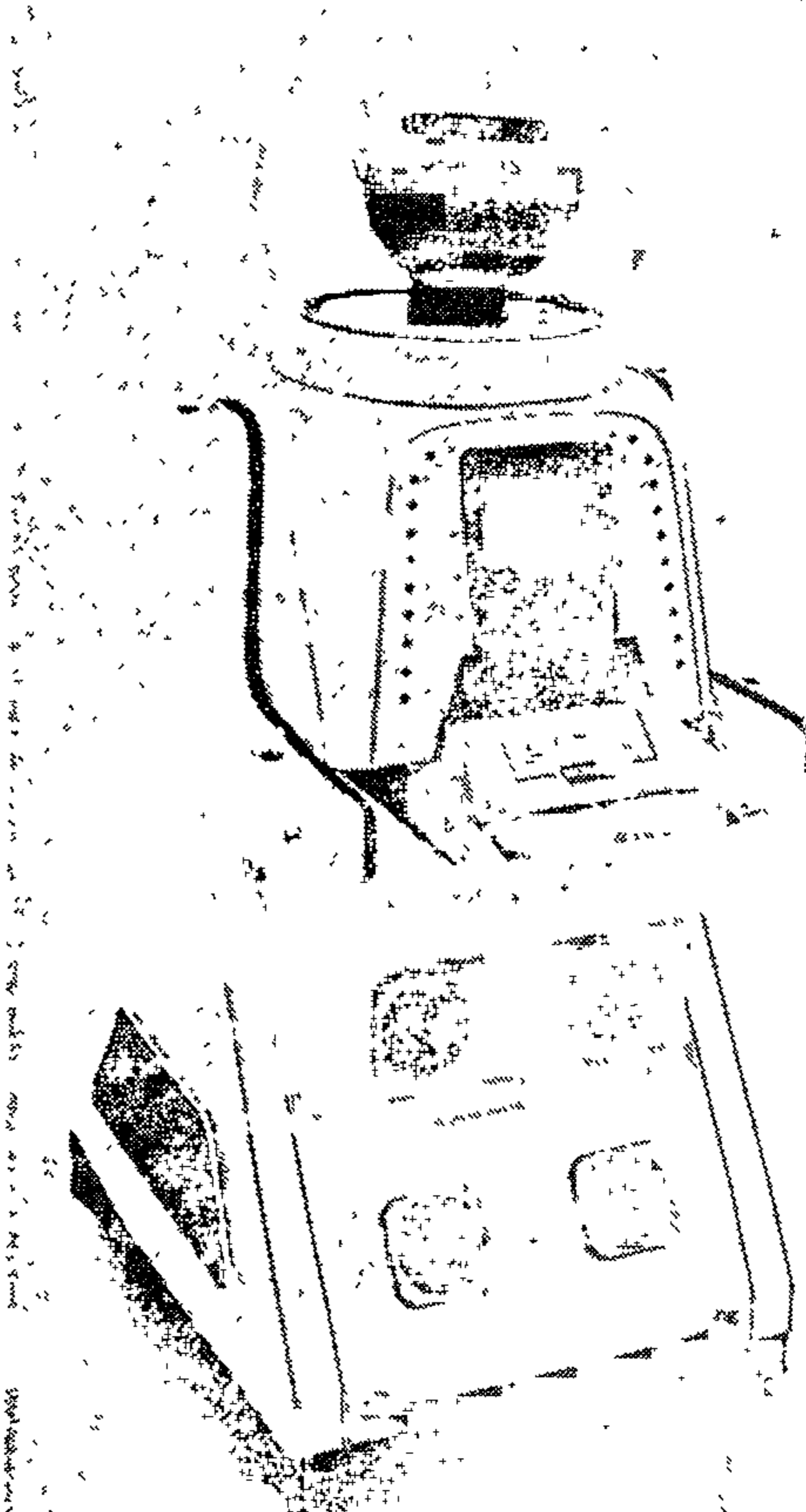
# industry

# from

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PMA

Star 21/7/82



Is he the shape of industry's future saviour? This is High Tech-1, developed mainly for amusement, but he could become invaluable in other directions.

wage demands.

The cost would be an initial capital investment — and robots were becoming cheaper every year — along with low running costs

The price of essential goods could then be pegged, and wage demands consequently held to a minimum, he said. Inflation could be held to low single figures and confidence in free enter-

that performed jobs previously done by human beings, was self-operating, incorporated electronic logic in the form of a microcomputer and was versatile — a characteristic which made robots economically feasible because they were designed for manufacturing tasks that frequently changed

The robot could be repeatedly reprogrammed to perform different functions through its microcomputer.

But despite recent advances, robots were at present limited in their usefulness, because they had to be carefully programmed to function in a precise manner and their workplace had to be rigidly controlled and coordinated. They could not as yet adapt to change voluntarily.

To overcome this, roboticists were developing sensory capacities including vision, hearing and touch for robots, as well as awareness in fields not possessed by humans, such as infra-red detection for specialised functions

Major advances in these fields were

felt to be possible within the next 10 years, making robots capable of working faster, with greater precision, more cheaply, in more hostile environments and for longer periods than humans.

Robots would then take over the routine, boring jobs, as well as those endangering life and health, such as mining minerals on the sea bed at pressures beyond human tolerance, and fabricating asbestos

In one typical operation involving die-casting, robots feeding and retrieving metal blanks from a furnace increased productivity more than 40 percent, reduced labour requirements by 70 percent and cut rejects by 15 percent.

Japanese engineers were planning an all-robot

factory which they hoped to have operational by 1985

General Electric believed that eventually all the individual parts of a computerised factory could be linked up

Draftsmen would design objects by computer with keyboards and screens, engineers would draw up production details and feed them to computer-controlled machine tools which would turn out the parts to be assembled by robots.

The industrial robot of today and tomorrow was far from the vision of science fiction and Hollywood

One of the commonest robots, the PUMA (Programmable Universal Machine for Assembly) was merely a flexible mechanical arm. Its hand could be a paint gun, riveter, scoop or claw

But the common concept of a robot with two arms and legs, and a tinny voice, might not be so far away, particularly in the home.

Although at present in the luxury gadget bracket, manufacturers were developing their domestic robots into valuable aids, and efficient servants.

Mr Joe Englebeger, director of Unimation, the world's biggest robot manufacturer, believed his head office would have a mobile robot to take coats and offer cups of coffee within the next three years.

Another US company was aiming to make its robot suitable for handicapped people, able to turn pages of books and pick up and fetch objects. These machines would move on tank tracks and possess two or more arms. Some might be programmed for receiving and uttering speech

The introduction of robots on a large scale would have a huge, generally favourable impact on conventional lifestyles, eliminating the dangerous and boring jobs and creating leisure time.

But as was pointed out in The Star last week, while a huge range of jobs will become available in the information services, there is a possibility of widespread redundancies in manufacturing industries

As another writer in the Futurist says "Just as the industrial revolution took many workers out of agriculture and employed them in industry so the microelectronics revolution must take many workers out of industry, retrain them and employ them in the production of information and other services"

Already more than half the US workforce is employed in the information industry. The robotics revolution is speeding up the transition to a better lifestyle where people will have time to enjoy themselves and the world around them

THIS IS



praise and democracy regained.

Industrial countries had realised the tremendous benefits of intelligent automation, and had initiated huge research programmes to develop the potential of thinking machines and increase productivity.

In general, a robot was a machine



MAN POWER - TECHNOLOGICAL CHANGES

1985

AREA G: Somerset West, King William's Town, Vredenburg, Worcester, Barkly West, Beaufort West, Caledon, Ceres, Cradock, Graaf-Reinet, Hermanus, Kuruman, Montagu, Postmasburg, Riversdal, Robertson, Swellendam, Tulbagh, Dannhauser, Eshome, Estcourt, Glencoe, Lions River, Lower Tugela, Vryheid, Mooi River, Paulpietersburg, Sasolburg, Bothaville, Bradford, Frankfort, Heilbron, Lindley, Parys, Reitz, Senekal, Theunissen, Viljoenskroon, Vrede, Vrededorp, Winburg, Letaba, (that portion of the Magisterial District of Phalaborwa, which prior to 1 January 1983 (Government notice 2644 of 10 December 1982) fell within the Magisterial District of Letaba); Amersfoort, Barberton, Belfast, Carolina, Groblersdal, Koster, (excluding that portion which prior to the publication of Government Notice 1105 of 26 July 1963, fell within the Magisterial Districts of Krugersdorp and Randfontein, but not the farms Moadowns 1, Hoffontein 17, Leeuwan 18, Ireton 19, Pahitiki 20, Bospan 21 and Rietfontein 48 in the Magisterial District of Randfontein), Lydenburg, Piet Retief, Soutpansberg, Standerton, Ventersdorp, Volksrust, Warmbaths, Waterberg and Waterval-Boven.

AREA F: Albany, Balfour, Bethal, Bethlehem, Ermelo, George, Gordonia, Harrismitlh, Highveld Ridge, Kip River, Kynsna, Lichtenburg, Lower Umfolozi, Malmesbury, Mossel Bay, Nelspruit, Newcastle, Oudtshoorn, Parys, Pietersburg, Port Shepstone, Potgietersrus, Rustenburg, Umzinto, Vryburg and White River.

AREA E: Kroonstad, and Worcester.

AREA D: Brits, Bronkhorstspuit, Camperdown, Cullinan, Heidelberg(Tvl), Henneman, Middelburg(Tvl), Potchefstroom, Virginia, Welkom and Wesselsbron.

AREA C: Bloemfontein, East London, Kimberley, Klerksdorp, Pietermaritzburg and Witbank.

AREA B: Somerset West, Stellenbosch, Strand and Wellington.

AREA A: Bellville, Boksburg, Brakpan, Durban, Goodwood, Inanda, Kempton Park, Kulis River, Nigel, Oberholzer, Paarl, Pinetown, Port Elizabeth, Pretoria, Randburg, Sasolburg, Simon's Town, The Cape, Uitenhage, Wonderboom and Wynberg.



# Govt to spend R336 000 on black artisans

By ALI MPHAKI

THE Government is to spend more than R336 000 on a new scheme for blacks to be trained as artisans while receiving allowances during training.

The scheme will kick off with a batch of 56 trainees in May at the Chamdor Training Centre in Krugersdorp, in what is seen as a major breakthrough for blacks as the scheme had been opened only for whites, coloured and Indians in the past.

The minimum educational requirement is Standard Six, and it does not mean those with higher qualifications cannot be eligible for the scheme.

After 12 months of intensive training, a trainee will be placed in employment with an approved employer for two years of in-service training.

A trainee with no dependants will receive R48 a week, a married one will

receive R60 a week, while a trainee with a wife and one child or more will receive R70 a week.

There will also be transport allowance and meals will be sold at a minimum price.

"Trainees will have to travel daily to the centre as there are no hostels, but the situation will be changed next year as we will be using the Manu Technical School in Molapo, Soweto, where there are hostels," assistant registrar Manpower Training, Mr Don Moody, said.

Those interested can apply to be bricklayers, plasterers, carpenters, electricians, domestic appliance mechanics, motor mechanics, diesel mechanics or tractor mechanics.

Enquiries can be made at the West Rand Development Board office at New Canada or any office of the Department of Manpower. Closing date for applications is February 28.

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(2) (a) No.

(b) It has not been deemed spectrally necessary to request the Board, to make recommendations on the creation of employment opportunities for unemployed contributors as the Directorate of Economic Planning in the Department of Constitutional Development and Planning and the National Manpower Commission have given serious attention to the unemployment question for several years and have submitted recommendations to the Government which led to the White Paper on A Strategy for the Creation of Employment Opportunities in the Republic of South Africa which was tabled last year. The Government accepted a recommendation to the effect that the National Manpower Commission and the Directorate of Planning launch an investigation into more effective methods that can be used to moderate cyclical increases in unemployment. In this process they have and will continue to consult with the Unemployment Insurance Commissioner and whenever necessary the Unemployment Insurance Board

Dieldrin

\*34 Mr E K MOORCROFT asked the Minister of Agricultural Economics

- (1) Whether any instances of dieldrin contamination have been reported to his Department, if so, (a) how many instances and (b) in which magisterial districts;
- (2) whether contamination of any food resources has been reported; if so, what resources;
- (3) whether any steps are being taken to trace the source of the contamination, if not, why not, if so, what steps,

(4) whether he will make a statement on the matter?

The MINISTER OF AGRICULTURAL ECONOMICS

- (1) No instances have been reported during the last 12 months
- (2) and (3) No
- (4) I issued a press statement on the matter on 5 February 1985. In view of recent allegations in the media that dieldrin is being used on sugar cane in Natal, a team of 35 inspectors of the Department visited 400 sugar cane farms in Natal during the period 5 to 7 February 1985. No evidence could be found that dieldrin is still being used. Approximately 200 kg of dieldrin which is more than 6 years old was found on farms. On to the condition of the containers it is clear that these stocks were acquired prior to 1 May 1981 and have not been used since. The dieldrin was removed from the farms.

\*35 Mr E K MOORCROFT asked the Minister of Law and Order

- (1) Whether the South African Police have conducted an investigation into the death of one Madodana Tyuka in Port Alfred Township, on or about 6 November 1984, if not, why not, if so, what were the findings of the investigation,
- (2) whether any person or persons have been taken into custody in connection with his death; if not, why not;
- (3) whether any other action has been taken as a result of the investigation; if so, what action?

The MINISTER OF LAW AND ORDER.

(1) Yes, the investigation of the inquest docket has not yet been concluded, but will on completion be referred to the attorney-general for a decision

(2) and (3) No Whether or not steps will be taken will be determined by the decision of the attorney-general

\*36. Mr P G SOAL asked the Minister of Mineral and Energy Affairs.

(1) Who are the members of Escom at present,

(2) whether persons appointed to Escom are required to have any special qualifications in regard to the supply of electricity, if not, why not, if so, what special qualifications does each of the present members of Escom possess,

(3) Whether the members of Escom are advised of losses which are not reflected in its books of account, if not, why not, if so,

(4) whether these members are required to take any action as a result of such losses, if not, why not, if so, what action?

The MINISTER OF MINERAL AND ENERGY AFFAIRS.

(1) Messrs Jan H Smith (Chairman)

D J Malan  
E Pavitt  
TR Castle  
The Honourable J F W Haak

(2) The members of the Electricity Supply Commission are appointed by the State President in terms of section 2(2) of the Electricity Act, 1958 (Act No 30 of 1958) for their knowledge and experience in respect of business or administration and, in so far as the State President may deem expedient, electricity supply. I would like to refer to the Honourable Member's attention also to

the reply to a question in his name, question 10 of 25 May 1983

(3) Members of the Electricity Supply Commission are informed about trade losses suffered by Escom even if, as a result of security and/or security requirements, it is not specified in accounts

(4) Yes Applicable actions of control as dictated by circumstances

\*37. Dr A I BORRAINE asked the Minister of Manpower

(1) Whether he or any member of his Department has received any representations concerning apprenticeship training for motor mechanics, if so, (a) from whom, (b) when and (c) what was (i) the nature of the representations and (ii) his response thereto,

(2) whether any changes in the training of apprentice motor mechanics are envisaged, if not, why not, if so, (a) what changes and (b) when?

The MINISTER OF MANPOWER

(1) Yes

(a) The major automobile manufacturers have made representations to the National Training Board.

(b) During 1983.

(c) (i) To have the existing system of training of apprentice motor mechanics changed. The proposed changes relate to institutionalized training by instructors as opposed to the present system of training on the shop floor by a qualified artisan as prescribed in the training schedules



(ii) The representations were referred to the Committee of Inquiry into the training of Apprentices and Artisans which has just completed its investigation. The final report and recommendations have not yet been submitted to me as Minister of Manpower.

Transportation Board has received any applications for members of all race groups to travel on buses in Durban; if so, (a) what was the nature of these applications and (b) (i) when and (ii) from whom were they received;

(2) whether these applications were granted; if not, why not; if so, when?

(2) Falls away.

MAOF Airline flight: passengers

\*38. Mr D J N MALCOMESS asked the Minister of Home Affairs

(1) Whether immigration officials at Jan Smuts Airport refused entry to South African nationals from a diverted MAOF Airline flight on or about 15 October 1984; if so, why;

(2) whether the aircraft in question returned to Jan Smuts Airport later on the same day, if so,

(3) whether these passengers were allowed clearance on their second arrival at this airport, if so, why,

(4) whether any conditions were attached to this clearance, if so, (a) why and (b) what conditions,

(5) whether he will make a statement on the matter?

The MINISTER OF HOME AFFAIRS:

(1) No. The Department of Transport is responsible for landing rights and facilities at State Airports. The honourable member should therefore address the rest of the question to the honourable Minister of Transport Affairs

*Hainsand Q. 61. 87*  
Durban Local Road Transportation Board

\*39. Mr D J N MALCOMESS asked the Minister of Transport Affairs:

(1) Whether the Durban Local Road

The MINISTER OF TRANSPORT AFFAIRS:

(1) Yes

(a) (i) To allow whites to use certain black services over specific routes, and

(ii) for the conveyance of white and non-white organized parties between specific points

(b) (i) On 2 March 1984 and 14 June 1983 respectively.

(ii) From Durban Transport Management Board and Mannpne Transport (Pty) Ltd.

(2) No. Local Road Transportation Boards are autonomous Statutory Bodies and are not obliged to disclose reasons for the granting or refusal of permits. For this reason a reply cannot be submitted.

\*40. Mr B B GOODALL—Mineral and Energy Affairs [Reply standing over.]

*Ow'n Affairs:*

\*1. Mr R W HARDINGHAM—Agriculture and Water Supply. [Reply standing over.]

\*2. Mr P G SOAL—Local Government, Housing and Works. [Reply standing over.]

\*3. Mr P G SOAL—Local Government, Housing and Works [Reply standing over.]

\*4. Mr H E J VAN RENSBURG—Education and Culture. [Reply standing over.]

\*5. Dr M S BARNARD—Health Services and Welfare. [Reply standing over.]

\*6. Mr A B WIDMAN—Local Government, Housing and Works. [Reply standing over.]

*For written reply*

*General Affairs*

*Hemward Q 61. 89*  
*12/2/85*

2. The LEADER OF THE OFFICIAL OPPOSITION asked the Minister of Defence

What was the cost, in connection with Exercise Thunder Charot, of (a) salaries of (i) members of the Permanent Force, (ii) members of the Citizen Force and (iii) national servicemen, (b) (i) petrol and (ii) aviation fuel, (c) (i) diesel and (ii) gas, (d) lubricants, (e) rations, (f) losses of equipment, (g) damage to (i) vehicles and (ii) other equipment, (h) claims by members of the public against the South African Defence Force, (i) printing and publications, (j) visits by (i) VIP's and (ii) members of the Press corps and (k) ammunition?

The MINISTER OF DEFENCE:

(a) (i) R1 222 582

(ii) R3 678 928

(iii) R 90 040

(b) (i) R 59 933

(ii) R 666 225

(c) (i) R 450 734

(ii) R 13 512

(d) R 29 845

(e) R1 175 911

(f) R 27 357

(g) (i) and (ii) The cost analysis of these items has not been completed.

(h) None.

(i) R 8 400

(j) (i) R 99 191

(ii) R 17 234

(k) R16 289 644.

In addition to the above mentioned costs the following expenditures also occurred

— Transport of participating troops from and to their homes/bases R 694 166

— Sundries R 144 613

Concerning the costs with relation to salaries, fuel, rations and ammunition it should be pointed out that:

a. The Permanent Force members and National Servicemen who took part in the exercise serve on a full-time basis and they would in any event have had to be paid. The Citizen Force units took part in the exercise during their annual training camp and their members would also have had to be paid if their camps had been held at another venue or over another period. This also applies to rations for the participating National Servicemen and Citizen Force members.

b. A substantial amount of the fuel which was used by aircraft and vehicles during the exercise would have been used during the annual training of the participating units

c. Ammunition has a limited shelf life. Annually a certain minimum amount of ammunition has to be expended to avoid reaching a stage where a large



(2) (a) No

(b) It has not been deemed specifically necessary to request the Board, to make recommendations on the creation of employment opportunities for unemployed contributors as the Directorate of Economic Planning in the Department of Constitutional Development and Planning and the National Manpower Commission have given serious attention to the unemployment question for several years and have submitted recommendations to the Government which led to the White Paper on A Strategy for the Creation of Employment Opportunities in the Republic of South Africa which was tabled last year. The Government accepted a recommendation to the effect that the National Manpower Commission and the Directorate of Planning launch an investigation into more effective methods that can be used to moderate cyclical increases in unemployment. In this process they have and will continue to consult with the Unemployment Insurance Commissioner and whenever necessary the Unemployment Insurance Board.

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- (2) whether contamination of any food resources has been reported, if so, what resources,
- (3) whether any steps are being taken to trace the source of the contamination;

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(4) whether he will make a statement on the matter?

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- (4) I issued a press statement on the matter on 5 February 1985. In view of recent allegations in the media that dieldrin is being used on sugar cane in Natal, a team of 35 inspectors of the Department visited 400 sugar cane farms in Natal during the period 5 to 7 February 1985. No evidence could be found that dieldrin is still being used. Approximately 200 kg of dieldrin which is more than 6 years old was found on farms. On to the condition of the containers it is clear that these stocks were acquired prior to 1 May 1981 and have not been used since. The dieldrin was removed from the farms.

*Handwritten: O. Col. 12/2/85*  
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- (1) Whether the South African Police have conducted an investigation into the death of one Madodana Tyuka in Port Alfred Township on or about 6 November 1984; if not, why not; if so, what were the findings of the investigation,
- (2) whether any person or persons have been taken into custody in connection with his death, if not, why not,
- (3) whether any other action has been taken as a result of the investigation, if so, what action?

**THE MINISTER OF LAW AND ORDER**

(1) Yes, the investigation of the inquest docket has not yet been concluded, but will on completion be referred to the attorney-general for a decision

(2) and (3) No. Whether or not steps will be taken will be determined by the decision of the attorney-general

*Handwritten: Howland*  
*Escom*  
*Q. Col. 12/2/85*  
 \*36 Mr P G SOAL asked the Minister of Mineral and Energy Affairs

- (1) Who are the members of Escom at present,
- (2) whether persons appointed to Escom are required to have any special qualifications in regard to the supply of electricity; if not, why not, if so, what special qualifications does each of the present members of Escom possess,
- (3) Whether the members of Escom are advised of losses which are not reflected in its books of account, if not, why not, if so,
- (4) whether these members are required to take any action as a result of such losses, if not, why not, if so, what action?

**THE MINISTER OF MINERAL AND ENERGY AFFAIRS**

- (1) Messrs Jan H Smith (Chairman)  
 D J Malan  
 E Pavitt  
 T R Castle  
 The Honourable J F W Haak

(2) The members of the Electricity Supply Commission are appointed by the State President in terms of section 2(2) of the Electricity Act, 1958 (Act No 30 of 1958) for their knowledge and experience in respect of business or administration and, in so far as the State President may deem expedient, electricity supply.  
 I would like to refer to the Honourable Member's attention also to

HoA

the reply to a question in his name, question 10 of 25 May 1983

(3) Members of the Electricity Supply Commission are informed about trade losses suffered by Escom even if, as a result of security and/or security requirements, it is not specified in accounts.

(4) Yes. Applicable actions of control as dictated by circumstances

*Handwritten: Howland*  
*Motor mechanics apprenticeship training*  
*Q. Col. 12/2/85*  
 \*37 Dr A L BORLAINE asked the Minister of Manpower

(1) Whether he or any member of his Department has received any representations concerning apprenticeship training for motor mechanics; if so, (a) from whom, (b) when and (c) what was (i) the nature of the representations and (ii) his response thereto,

(2) whether any changes in the training of apprentice motor mechanics are envisaged, if not, why not, if so, (a) what changes and (b) when?

**THE MINISTER OF MANPOWER**

(1) Yes

(a) The major automobile manufacturers have made representations to the National Training Board

(b) During 1983

(c) (i) To have the existing system of training of apprentice motor mechanics changed. The proposed changes relate to institutionalized training by instructors as opposed to the present system of training on the shop floor by a qualified artisan as prescribed in the training schedules



# Youths to get post-matric training at Pta firm

BY the end of this year, close to 100 young blacks — mainly from the Brits area — will have undergone post-matriculation industrial orientation and training at an establishment unique in the motor industry.

This is the Alfa Romeo Institute for Technology at the company's assembly plant at Brits.

It was set up at the beginning of last year because the company felt there was too much talk in the private sector about the shortage of skilled labour, and too little action

"Our institute is open to any black youngster who has matriculated in science subjects, and he or she is not obliged at all to work for us afterwards," says the principal, Mr De Mist van Zyl, who is also Alfa's training manager

The courses are free and accepted students receive a small allowance

Acceptance does not depend on matriculation symbols "We realise that, when there is

such a shortage of qualified black teachers in science subjects, these may not be an accurate reflection of students' real ability," says Van Zyl

## Interest

"As long as applicants show an interest in the compulsory subjects we offer — mathematics, chemistry, physics, economics or industrial economics — we are prepared to give them a chance"

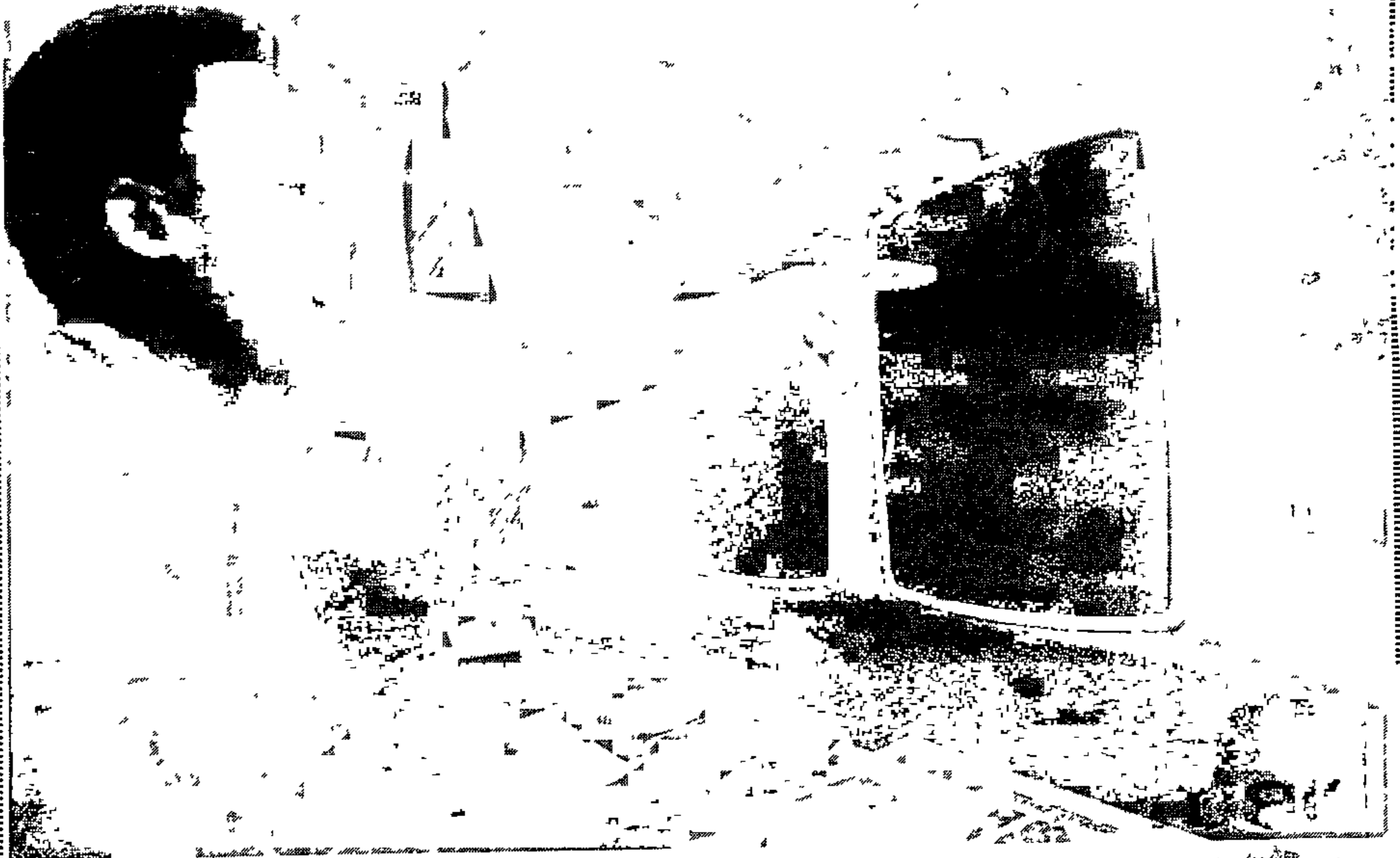
The institution plays a particularly important role in the Brits area, where post-school educational opportunities are limited. Libraries in the vicinity do not have industrial textbooks, and most students have no transport or electricity at home

The theoretical part of the course lasts for six months, after which students undertake six months' practical work in various parts of the

Alfa factory, depending on their own choice. And another intake of 25 starts the course

Although it's not the intention that the institute should cater particularly to children of Alfa employees, in practice this is so in many cases

"Employees have come to us to express their gratitude for this extra opportunity afforded to their children," says Mr van Zyl



A LECTURER explains the control systems of a computer/word processor to a student at Brits in the Transvaal.

22 2 85  
D. Dispatch  
\$7 (5) (179) (6/16)  
**US firm to support black education**

AKRON (Ohio) — An American company is to spend about R1 million annually for the next three years to support programmes enhancing economic opportunities for blacks in South Africa

Announcing this here yesterday the Firestone Tire and Rubber Company said Firestone South Africa (Pty), in which the American firm had a 25 per cent equity interest, and other manufacturers in South Africa had frequently been confronted by serious shortages of skilled labour, despite the high level of black unemployment

It also concluded that the South African company's future marketing opportunities would largely be determined by the ability of blacks to earn incomes sufficiently high to permit them to become active consumers of tyres and other automotive products

"As a result of its deliberations, the board decided that Firestone could respond more effectively to its ethical and social responsibilities as a United States investor in South Africa, and to the long-term economic interests of its shareholders, if it dedicated approximately 25 per cent of the dividend income and trademark fees that the company receives from Firestone South Africa to support educational and training programmes that were

responsive to the needs of blacks in South Africa

"Firestone will begin immediately to channel funds to the South African Council for Higher Education (Sached) trust and the Institute of International Education," and also intended to increase its support of the Iqhayiya Technical College, the company said

Sached is a multi-racial, black-led organisation which addresses a wide variety of educational needs in South

Africa

The New York-based Institute of International Education sponsors students from South Africa who attend American Colleges and universities on the understanding that they will return to South Africa on completion of their studies

Iqhayiya Technical College, which has about 1000 students, is the first privately-funded technical college in South Africa, according to Firestone — SAPA



# 'Urgent need for local artisans'

(179) E. Post 22/2/87

Post Reporter

DESPITE widespread unemployment — especially among blacks — South Africa was still "importing" technically qualified people from overseas, Mr Peter Morum, managing director of Firestone, South Africa, said today

This was as a result of the shortage of local artisans and skilled labour — a problem to which the country needed to give urgent attention

Mr Morum was commenting on Firestone's recent decision to spend about R1 million annually for the next three years on support programmes enhancing economic opportunities for blacks in South Africa

This scheme would be implemented this year, he said

Mr Morum said the country's education generally tended to be slanted towards the arts. Consequently a greater emphasis needed to be placed on acquiring technical skills

Mr Morum said the money would be channelled in donations to development schools and bursaries for students to study at technikons

The money would assist all blacks — not just those associated with Firestone. The decision to sponsor black technical training had only recently been taken and already the company was investigating options

*D. Dispatch* *23/2/85*  
**US company pledges  
R3m to train blacks**

PORT ELIZABETH —  
The Firestone Tire and  
Rubber Company has  
announced that it will  
spend about R1 million  
during each of the next  
three years to support  
programmes to enhance  
economic opportunities  
available to blacks in  
South Africa

A statement issued on  
behalf of the company

said the US board had  
decided Firestone  
should dedicate about 25  
per cent of the dividend  
income and trademark  
fees that the company  
received from Firestone  
South Africa to support  
educational and training  
programmes that were  
responsive to the needs  
of blacks in South Africa. — DDC



179A

# A Business Day Special Report

# Robotics

A RAND DAILY MAIL PUBLICATION

Johannesburg, Thursday, February, 28 1985

Ready or not, society must face decisions now as... Oracle's

## Priests of high-tech teach industry survival

## speedy sheep shear

**ROBOTS.** The word conjures visions of R2D2 and C3PO, or the curious orange creature that featured in TV's 'Riptide', periodically flashing "Nice one, Murray" on his screen.

In the case of the Star Wars duo, that technology is light years away, and Murray Bozinsky's robot might, to all intents and purposes, be on another planet.

The state of the art is such that even those machines being designed with "vision" at present have a hard enough time simply recognising a rock, let alone noting that Princess Leia is looking good today

Yet, when you accompany any engineer to his robot room, you find yourself entering as if into a cathedral. And truly, you are in the company of a high priest — but this time of high technology

For this is a new religion, one that offers new life for industry if society can stand the socio-economic baptism.

And so you enter the robot room. Several are being tested. Mechanical arms move up and down and sideways, while mechanical hands twist left and right, under and over — all with a hypnotic rhythm to the tune of a continual, quiet electro-mechanical buzzing

Computers stand round about the robots, and men stand about the computers. The computers are to the robots, a light flashes occasionally on a panel indicating that this is so.

You, the non-cognoscentus, find yourself wondering what this is all about. You look to the high priest with a question, but the gleam in his eye warns that anything you say may be construed as infantile

Because truly, you had been expecting "Star Wars"; instead you are confronted with these dolittle machines. And yes, the high priest will confirm to you, without rancour, that these machines are, in fact, definitely not intelligent

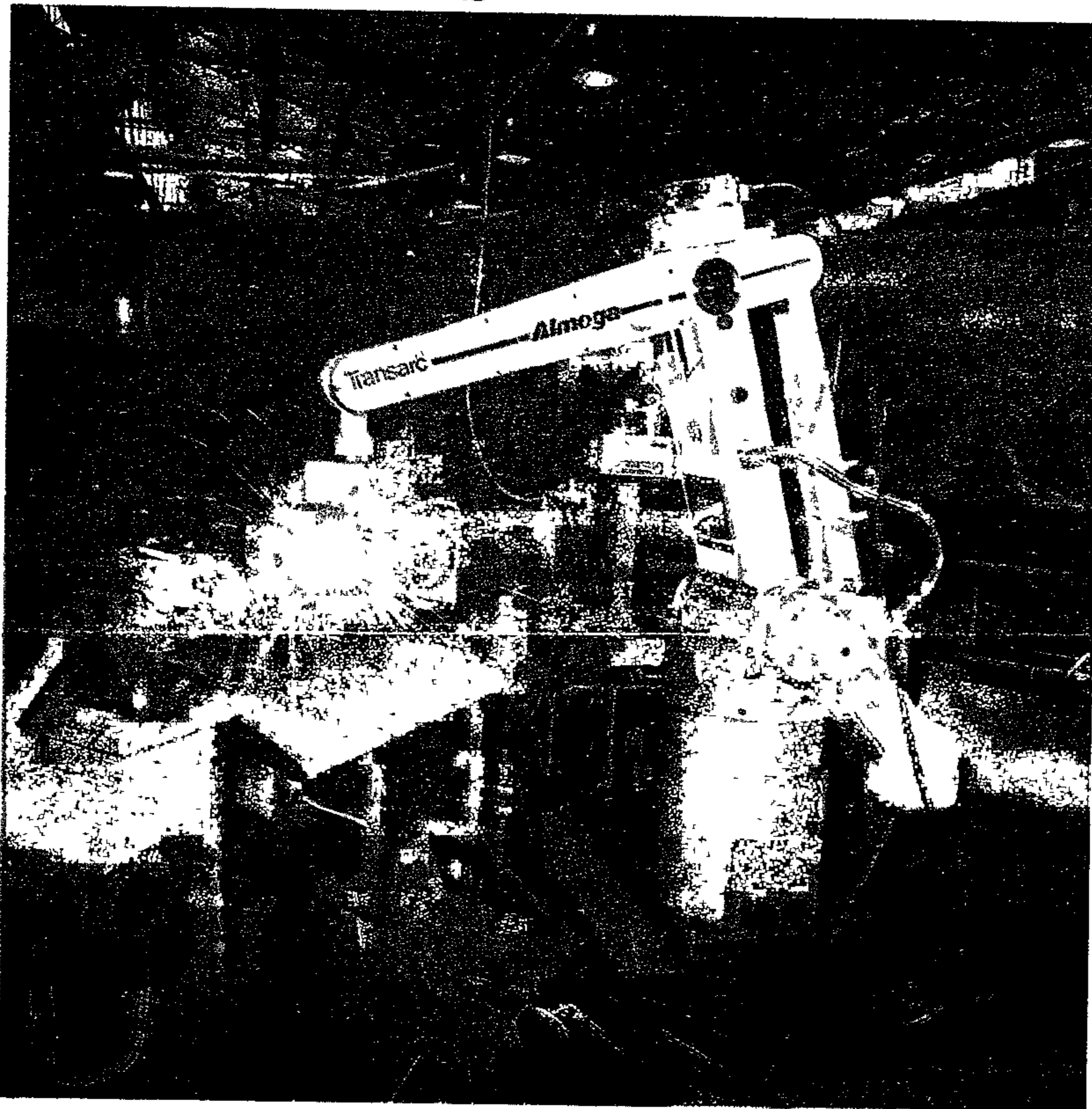
The overpowering initial impression is one of enormous contrast — between the technology employed and the robot's ability.

A higher-order industrial robot will, perhaps, pick up an object on a manufacturing/production line, shift it to an appropriate point, position it precisely, and insert another component

But teaching those apparently simple skills to a robot requires technology of the highest order — a combination of engineering and advanced mathematics harnessed to computer power.

You think, these machines are performing functions that even the most simple-minded individual would take completely for granted. Ah, but the robot can perform those functions precisely time after time after time after time — and get it right every time.

A human operator, on the other hand, might become tired, or bored, his efficiency will begin to slip, he will need to take a break, he might go mad with the monotony of it, he might even get sick if the operating



The face of the industrial future — a dedicated robot welding unit at work on passenger and light delivery axle tubes in a Uitenhage motor manufacturing factory. This robot was supplied by Afrox. Welding presently leads the way in the application of robotics in South African industrial production lines.

environment is not healthy.

The quality of his workmanship will eventually give way to these pressures, despite the need for precision, exactitude, and increased productivity.

If you want to change the production line to a different product, the robot is easily reprogrammed — or refitted — to deal with it. People are not quite as adaptable.

Robotics are the industrial future. For years, the futurists have been warning of an impending second industrial revolution. Now the future is rushing up at us.

Society in general — and ours most particularly — faces some painful decisions about the new technology.

Robotics in particular will undoubtedly have a socio-economic impact on South Africa in the long term, although this new industrial technology may take some 10 years to get a real hold on manufacturing.

But the debate has begun and at its heart is fear. Fear of the consequences as far as these can presently be quantified, of change, and of the unknown.

Some Government officials — faced with burgeoning black unemployment and the crushing burden of job creation — have looked towards expanding labour-intensive production

Others — faced with the unpalatable facts of South Africa's ever-declining competitiveness — have looked towards the redevelopment of the industrial base using high technology, to reduce labour costs and match international standards.

Of primary concern is jobs, some of which will be sacrificed on the altar of the new religion — here as they have been elsewhere.

Thus the high priests of hi-tech acknowledge, but they point out that the industrial consequences of resisting robots could be disastrous as international competitiveness and demands for superior manufacture intensify.

The roboticists say either robots and less jobs, or no jobs at all.

Already, Government programmes introduced as recently as five years ago, to train certain types of skilled worker, are becoming outmoded. Robots are fast making some of these categories of human work and skills redundant on the factory floor.

That's how quickly robotics is outstripping society's present ability, *yea willingness*, to adjust to high technology.

Some cause for comfort to labour is that South Africa has a shortage of skilled labour. Industrial robots are being applied to skilled labour

requirements so, for the meantime, they are freeing skilled labour for use elsewhere.

Socio-economic adaptation will, in the final analysis, require a society such as ours radically to overhaul its ideas about itself and where it has to go. It may require fundamental shifts in socio-economic policy.

Robotics — and high technology — must be viewed in a global context: global in geography and global in the many conceptual disciplines which bear upon the nature of industrial society.

About 45 industrial robots are in use in South Africa so far. For some perspective on the matter, note that the Volkswagen factory in Munich employs 650, and the Toyota factories in Japan about 1 500.

Nevertheless, the time to come to grips with robots is now. One robotics chief for a major South African corporation said "The Government doesn't know how to handle this, managements are afraid of it, unions have had the hell scared out of them. But they all know it's coming!"

The pressure is on. Believe it. Broad vision and bold action — by Government, management and workers — are required to meet the challenge.

SHEEP-shearing — once the lot of burly, sweating farmhands — has been turned over to a robot.

The Australian Wool Corporation and roboticists at the University of Western Australia have developed an experimental robot called Oracle which has already sheared more than 200 sheep.

A few sheep have been nicked in the process, but it's all in the name of productivity and science and the sheep are little the worse for wear.

The low injury rate has been achieved using sensors mounted on the shearing cutter, which allows Oracle's computer to keep the cutter moving just above the skin.

The system can react to changes in cutter height in less than 10 thousandths of a second. A fundamental part of the software is a model or map of the shape of the sheep's skin, and shearing movements are programmed in relation to fixed points on the map.

This is only approximate but it enables the robot to approach the sheep until the cutter is close enough for the sensors mounted on it to detect the skin.

Once the cutter has "landed", the programme allows it to follow a path defined in the model surface, even though the actual path may lie above or below it.

Unfortunately for the sheep, they're all different, a single surface model does not suffice and if the sheep surface deviates too much from the computer's model, the robot gets "lost".

To compensate for this and for the sheep's movements during shearing — consider, it usually requires a burly, sweating farmhand to persuade a sheep to be still during this process — the robot adapts its model of the sheep before and during the shearing.

After the shearing, the robot determines how much the predicted surface model differed from the actual sheep by measuring the adaptation required on the predicted model. This information is used to improve the prediction on the next sheep.

All of which should help to reduce the shear terror of the sheep. At least, they don't get shouted at.

### NAMING THE DRUDGE

In case you'd forgotten... the word "robot" wasn't invented by a brilliant engineer.

It is the product of a humble scribe.

Czech dramatist Karel Capek coined the word in 1917, in his play 'RUR' (Rossum's Universal Robot).

Capek, much influenced by the early writings of H G Wells, wrote the play inspired by his sensitivity to what he perceived as the dangers of science, particularly regimentation by the machine.

"Robot" derives, appropriately, from the Czech word *robotit*, meaning "to drudge".



# CIM links isles of automation

## This smartie climbs stairs

By GEOFFREY CHARLISH  
of the Financial Times

WHEN THE digital computer first took root in the late 1950s experts predicted that within a decade single machines would control whole factories. But no such totally embracing implementation could ever have occurred — for organisational reasons that soon became obvious. Only incremental progress was on the cards.

Over the years "islands" of computer automation have formed, initially to manage production scheduling, for example, or to run unmanned machine tools.

Later, computer aided design (CAD) emerged, in which drawings could be constructed on a TV screen, manipulated, up-dated and stored electronically. Meanwhile, at the other end of the factory — at any rate in the electronics industry — product complexity demanded that production testing be carried out by computer.

The next arrival was the robot, and it too was controlled by computer. Now, the prophecies of 1954 are beginning to come true. But the computing power is distributed, not centralised.

And the time is coming for those distributed islands of automation to be bridged and the acronym on the experts' lips is CIM, or computer integrated manufacturing, and there are 100 other companies with their eye on this \$1.5bn world market.

CAD software experts soon realised that once all the dimensions of a product had been defined it would be logical to extend the "computer aided" idea beyond design and into production areas.

Thus, CAE or computer aided engineering, was born, in which the "what if" methods of prototyping can be carried out on-screen without cutting any real metal at all.

For example, a crane job or an aircraft wing can be loaded until it buckles and the failure points observed. The stresses can be seen as different coloured areas on the "solid" model on the screen. Thermal and kinematic properties can also be studied — some software will animate the moving parts of, say, a car engine.

Some of the software allows the 3D solid colour model, with definition not far short of a colour photograph, to be "opened up" to see what is inside. With systems like this, separate component parts can be designed and then assembled on the screen.

Although these facilities are impressive, the system is only doing what a human brain would do with the same data on many drawings and other pieces of paper. But it is doing it hundreds of times faster, the paperwork disappears and there are no errors.

Moreover, all the interested parties in design offices and management, armed with terminals, will always have access to exactly the same information. Better products, designed more quickly and cost effectively, are the result.

A further derivative of CAD is CAM, or computer aided manufacturing. From the same collection of comprehensive information about the product, the computer can derive moulds, dies, tools and machining strategies. Some systems allow engineers visually to verify numerical control programs; the tool can be seen moving around the machined part.

Similarly, the movements of coordinate measurement machines can be pre-planned allowing inspection procedures to be worked out in advance.

The common database also allow "group technology" to be implemented: the designer can scan it to look for past designs that are similar to his current project, avoiding "re-inventing the wheel."

The final step, CIM, will not be suddenly implemented universally. It will grow in many medium-sized and large companies from a basis of enhanced CAD/CAM/CAE.

For example, robots can be programmed on screen and robots are already fairly common in manufacturing cells controlled by another computer. The two must communicate. Similarly, guided track computers must speak to, say, the flexible manufacturing system (FMS) the vehicles are supplying.

Similarly, in electronics manufacturing, product testing requirements can be considered at the design stage by linking test programming terminals to CAD terminals. Several auto-test companies have announced network products.

CIM is a philosophy, not a technology. It is something that leaves no department of a manufacturing company untouched. Decisions to implement have to come from the top.

HITACHI has developed a prototype mobile intelligent robot that assesses the conditions surrounding it and determines the action to be taken during operations.

The robot can climb stairs or stepped surfaces, open or close doors and valves, operate switches and wipe floors and walls. It is expected to perform operations under harsh conditions, handle hazardous substances and substantially ease the maintenance of large plants or buildings.

The robot's potential pattern guidance system allows it to compare what it expects to see with the actual visual pictures it receives from the target sight patterns that are reproduced in a three-dimensional map.

As the patterns overlap the robot computes the signals — guiding vector, direction, speed — and guides itself to the target. The robot is capable of deciding on alternative routes when confronted by an obstacle.

A television camera with a visibility angle of 162 degrees — the same as that of humans — has been incorporated as the robot's eye.

## WELDING LEADS THE WAY WITH TRIPLE JUMP FROM ART TO SCIENCE

By PAUL BELL

THIRTY-three of the 38 robots installed on South African production lines by last September — 86% — were employed in welding tasks.

Why? Arc Engineering's Mr Terry Rosenberg, a leading South African robot engineer has described welding as an art. The robot, he says, makes it a science.

A robot team's productivity is at least two to three times that of a welder working alone.

Despite the investment involved, the cost per welded unit is lower for a robot and one operator than for a single welder.

One robot manufacturer has developed this rule of thumb. With runs of less than 400 units a year you

are probably better off with human welders. With runs of more than 60 000, you might require a dedicated piece of machinery.

Between these two points, a robot is often the most economical solution.

Here are 11 illustrations of robot vs manual welding efficiency:

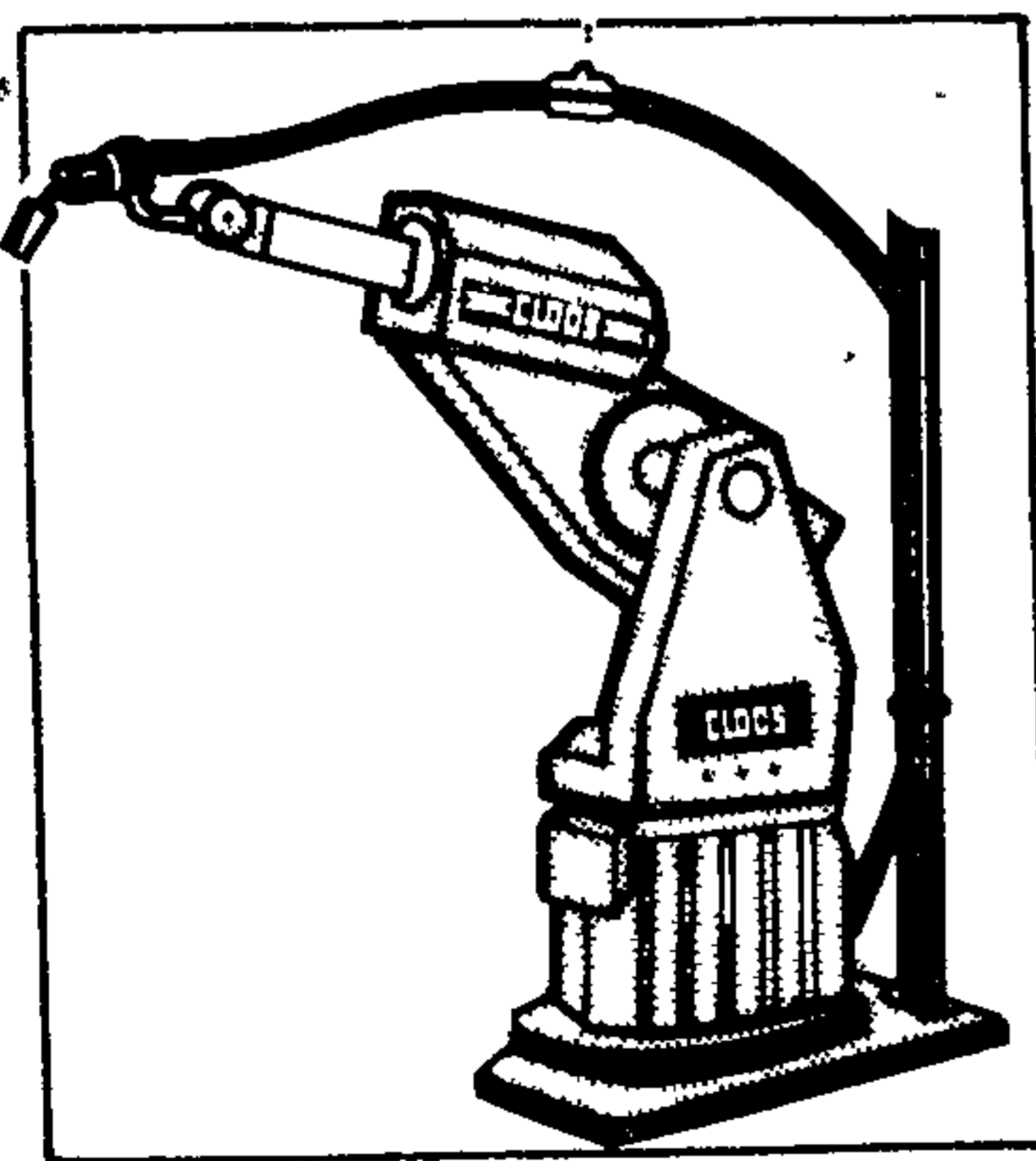
a mud guard — robot 6,2 min, manual 18,5 min, a step — robot 3 min, manual 9,7 min, a support frame — robot 6,4 min, manual 18,7 min; a rear support — robot 30 min, manual 150 min, a mo-ped frame — robot 4 min, manual 12 min, a cross-stay — robot 5,3 min, manual 19,2 min, a swinging arm — robot 6,9 min, manual 60 min, a rack — robot 10 min, manual 30 min, a reinforce-

ment section — robot 7 min, manual 20 min, an axle — robot 22,4 min, manual 50,4 min, a pump housing — robot 3 hrs, manual 5,5 hrs.

Afrox robot chief Mr Terry Riley believes that, while most of the applications have been in welding so far, South Africa will follow the world trend in the growth of materials handling robots.

# ROBOT WELDING & CUTTING

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New Germany	72 0527	Richards Bay	51364/5	Witbank	5767

## What's in a name... a world of difference

By PAUL BELL

ROBOTS mean different things to different people.

The Japanese, for example, include in their definition so-called manual manipulators and fixed sequence machines, in terms of which, according to 1982 figures, they had 67 435 operating robots, in comparison with the US figure that year of 4 700.

Using the American definition, however, the Japanese would have had 14 246. The Robot Institution of America's definition holds sway everywhere outside Japan. It describes a robot as:

"A reprogrammable, multifunctional manipulator designed to move material, parts, tools or specialised devices... through variable programmed motions for the performing of a variety of tasks."

Other basic terminology includes the description "manipulator", referring to the robot's base and the arm which moves the materials handled.

The manipulator is governed by a controller, a second component of all robots comprising computers and microprocessors.

The third component is the end-effector, the counterpart of the human hand, which is either a specialised tool or gripper.

Robots, like industrial machinery in general, can be driven in three ways:

- pneumatically, ie through the use of compressed air, which offers the cheapest design,
- electrically, which is more energy-efficient and stronger, but about five times more expensive; and
- hydraulically, ie using compressed fluids, which is between the first two in cost.

Industrial robots are classified into various types, says Professor Mike Rodd of MechaTronics at Wits. The generally accepted division is:

- the manual manipulator — an arm/manipulator operated by a human, maybe at a remote site
- the fixed frequency control robot — a manipulator whose control motions are fixed and whose patterns of operation cannot be easily changed
- the variable sequence control robot — a manipulator whose control motions

are fixed but whose patterns of operation may be relatively easily changed.

- the playback robot — a manipulator which can be taught by a human operator by being moved through the motions it is expected to follow. It can memorise a sequence of these motions as well as other necessary information, and read and follow the motions to perform the assigned task when so instructed. Almost all welding and painting robots are of this type.

- the NC robot — this operates under numerical control by paper tape or cards that bear information such as working sequences and positions. Transfer robots incorporated into manufacturing lines belong in this type, regularly and repeatedly moving objects from one place to another.

- the intelligent robot — with sensory and cognitive functions, capable of making decisions alone, albeit relatively simplistic decisions.

Robot capabilities can be classified as follows: manipulation; locomotion; sensing; and control and communication.

Prof Rodd says the sensing capability of current robots is still relatively primitive, and achieved by a range of contact switches or photo-electric or infra-red detectors able to imitate automatic robot movement to prevent dangerous actions from occurring.

For example, a conveyor belt that supplies to, or removes parts from, a robot should start only when the robot is correctly positioned. Or, the jaws of a metal press should not close until the robot has removed its hand.

Four prime sensing capabilities which are in different stages of development are force, tactile, proximity and vision, some of which have become industrially viable.

Manipulators and end-effectors probably represent the most refined capabilities of current robots. Generally diverse "hands" have been developed for different applications: these include grippers to take hold of heavy components or plate glass, or special purpose tools like welding torches, grinders or drills.



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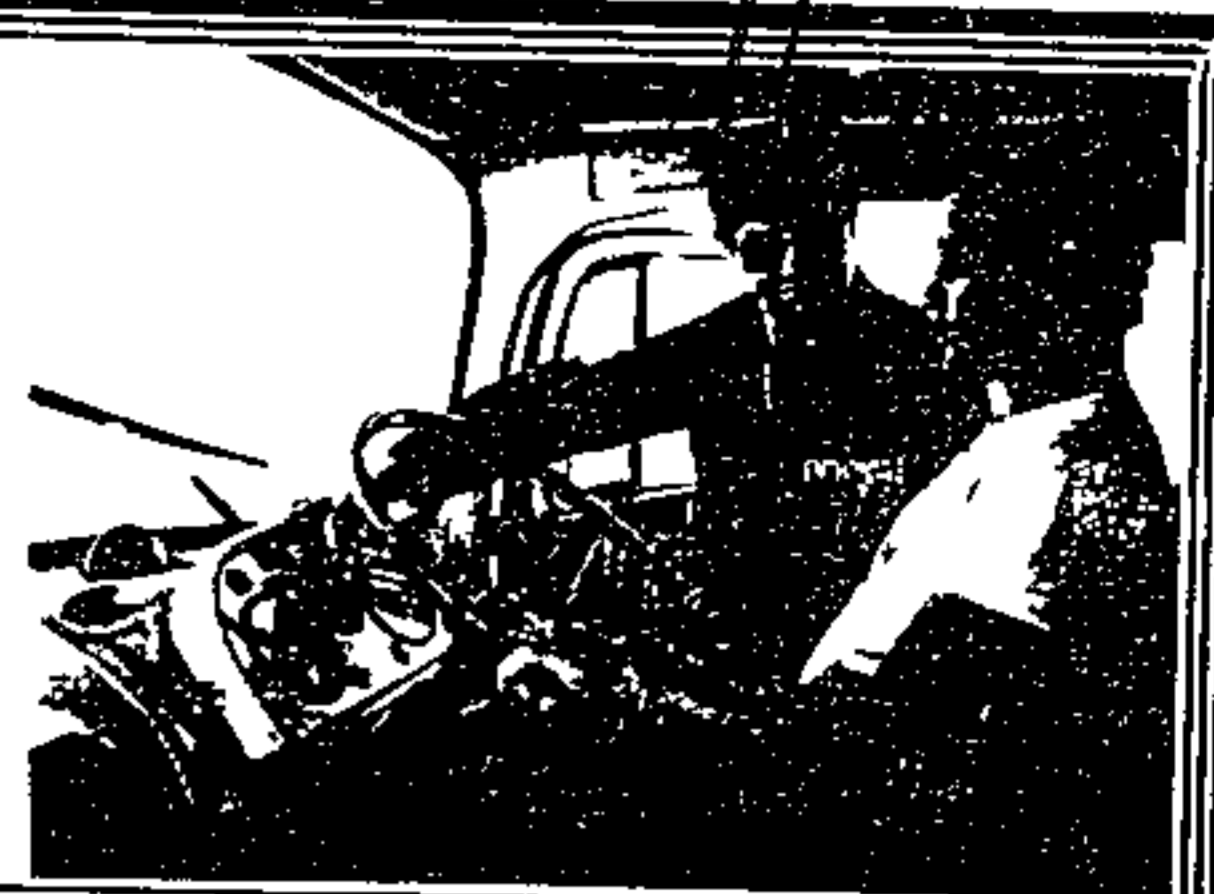
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Contact: Charl de Villiers, Pieter Gouws, Keith Walrus, Phone (0422) 27823



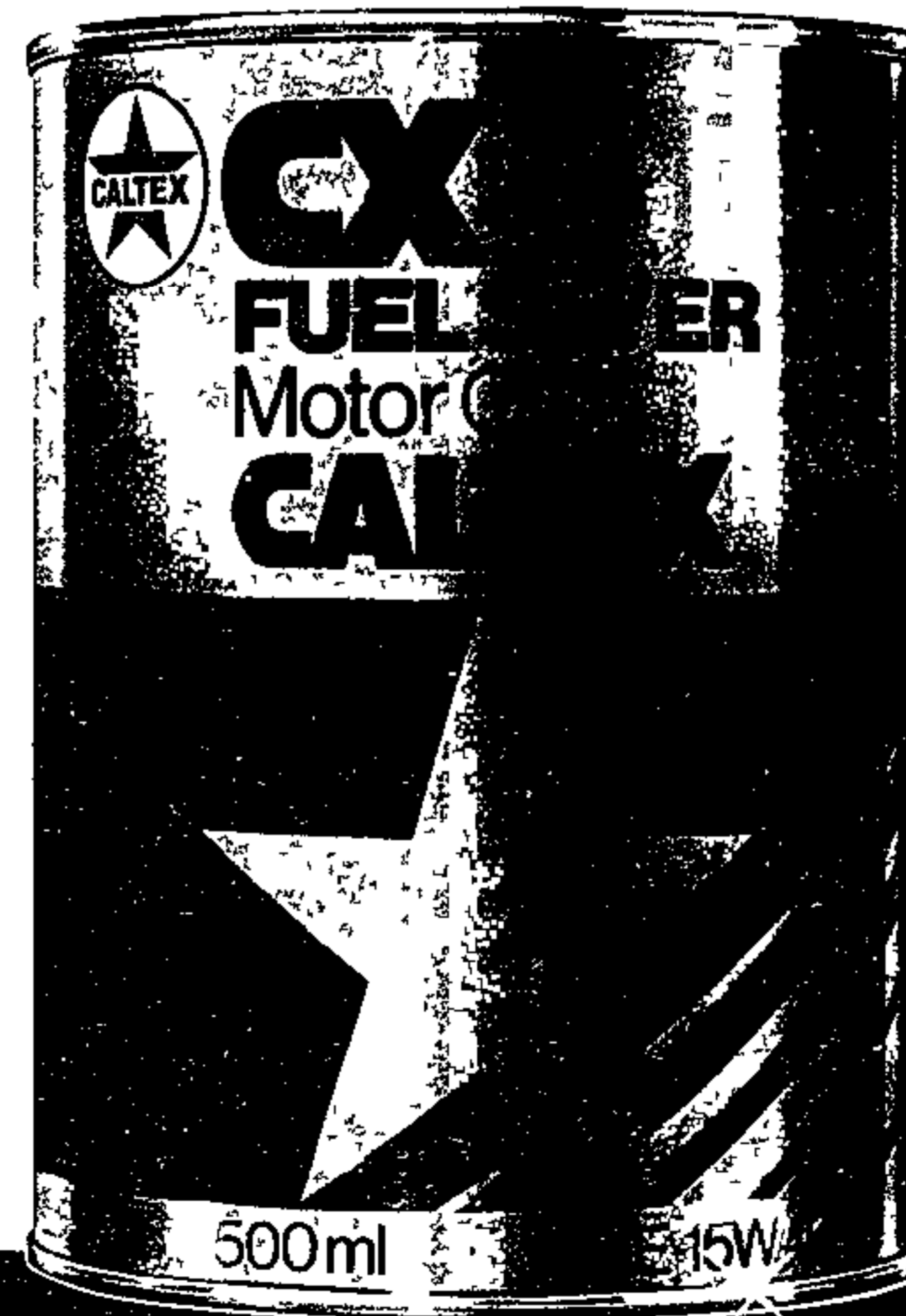
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on their ongoing contribution to the development of manpower in the Eastern Cape

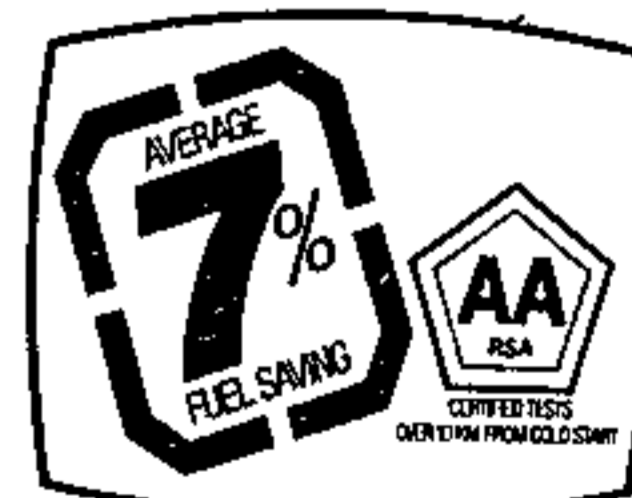
Mr Peter Morum, managing director of Firestone, reflected similar thoughts in his recent address at the opening of the 1985 academic year at the Technikon in Port Elizabeth when he said:  
"We have this continuing contradiction of tremendous unemployment of unskilled people with shortages of skilled people in our country. Have we really addressed this massive problem? There must be a pool of natural talent of the unskilled which we can utilise.  
"Whenever we go into a growth cycle in our economy, we have immediate need to bring in skilled people from overseas. This has been the case for as long as I can remember - yet we have probably the highest incidence of unemployment in our country (certainly over 20 per cent of our black population) right here in Port Elizabeth"

## Generous subsidies

**Generous subsidies** are available for companies who avail themselves of training employees whose gross emoluments during a firm's financial year do not exceed R15 000 per  
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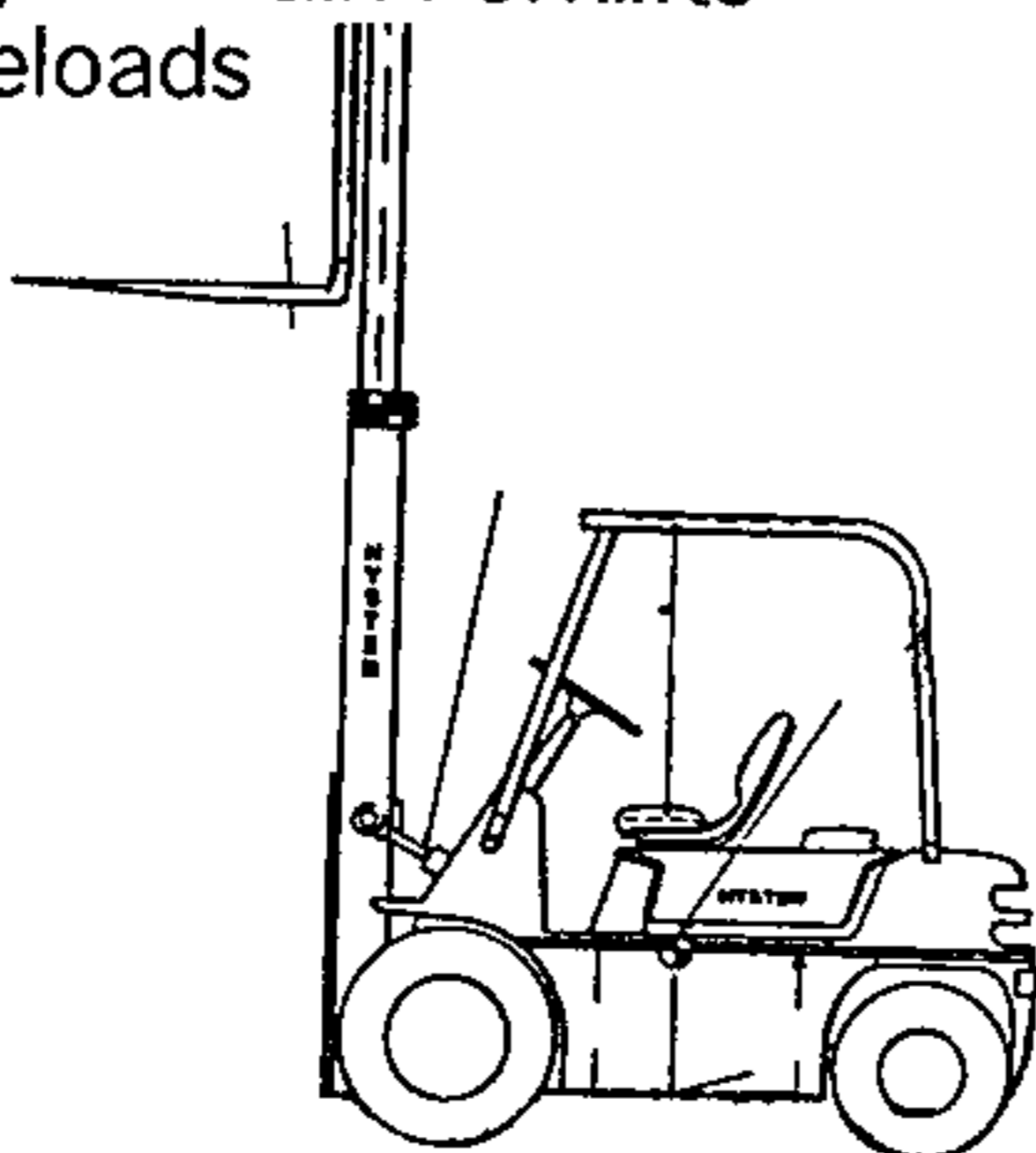
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*179* Hotel schools *Q 61 459*  
 7/3/85  
 336 Mr S S VAN DER MERWE asked the Minister of Environment Affairs and Tourism:

- (1) How many (a) White, (b) Coloured, (c) Indian and (d) Black persons (i) applied for admission to and (ii) were accepted at each specified hotel school under the control of his Department in 1985;
- (2) whether his Department received any representations regarding these schools in 1984; if so, (a) from whom, (b) when and (c) what was (i) the nature of the representations and (ii) his response thereto,
- (3) whether he intends to extend the facilities at these schools to cater for more students, if not, why not, if so, when?

**THE MINISTER OF ENVIRONMENT AFFAIRS AND TOURISM**

- (1) Only the Landdrost Hotel School is being managed by the South African Tourism Board
 

(a)	(i)	10.
	(ii)	6.
(b)	(i)	30
	(ii)	22.
(c)	(i)	0.
	(ii)	0.
(d)	(i)	0
	(ii)	0.
- (2) No.

(3) No The facilities at the Landdrost Hotel cannot be extended and the course is at present under-subscribed. It has been accepted as policy that the South African Tourism Board should not be involved directly in the

training of persons for the hotel industry. Negotiations are, therefore, already being conducted with various bodies regarding the transfer of the Landdrost Hotel School.

*Howard Q 61 460*  
 7/3/85  
 340 Mr S S VAN DER MERWE asked the Minister of Home Affairs

How many (a) White, (b) Coloured, (c) Indian and (d) Black persons who were (i) administrative, (ii) clerical, (iii) professional, (iv) technical and (v) general A staff, were there in the Public Service as at the latest specified date for which figures are available?

**THE MINISTER OF HOME AFFAIRS**

Particulars are at present available in respect of posts which on 30 September 1984 were filled by Whites on the one hand and by Coloureds, Indians and Blacks combined on the other hand. Particulars are as follows.

(a)	(b), (c) en (d)
(i)	8 515
(ii)	19 563
(iii)	7 222
(iv)	5 225
(v)	850
	335
	3 587
	1 317
	141
	243

**Acquired immune deficiency syndrome**

350 Dr M S BARNARD asked the Minister of Health and Welfare

How many cases of acquired immune deficiency syndrome were (a) reported and (b) diagnosed in the latest specified 12-month period for which figures are available?

**THE MINISTER OF HEALTH AND WELFARE:**

- (a) The condition is not notifiable or reportable
- (b) During 1984 10 cases

*Howard Q 61 460*  
 7/3/85  
 351 Dr M S BARNARD asked the Minister of Health and Welfare  
 How many hospital beds were (a) avail-

able and (b) needed for (i) White and (ii) non-White patients in hospitals falling under the control of his Department as at the latest specified date for which figures are available?

**THE MINISTER OF HEALTH AND WELFARE.**

(a) Beds available as at 31/1/85.

- (i) Whites 6 105.
  - (ii) non-White 10 270.
- (b) Needed as at 31/1/85.

**Midwives/health visitors radiographers/sister tutors**

352 Dr M S BARNARD asked the Minister of Health and Welfare.

How many (a) Blacks, (b) Indians, (c) Coloureds and (d) Whites registered as (i) midwives, (ii) health visitors, (iii) radiographers and (iv) sister tutors in 1984?

**THE MINISTER OF HEALTH AND WELFARE.**

This information can only be furnished towards the end of March 1985 when all 1984 figures have been processed.

**Para-medical personnel**

353 Dr M S BARNARD asked the Minister of Co-operation, Development and Education

How many students (a) were enrolled in 1984 in each of the years of study at institutions falling under the control of his Department for training as (i) health assistants, (ii) health inspectors, (iii) public health nurses, (iv) medical laboratory technologists, (v) dental therapists, (vi) radiographers, (vii) physiotherapists and (viii) other specified para-medical personnel and (b) passed their final examination in that year in each of these courses of study?

**THE MINISTER OF CO-OPERATION, DEVELOPMENT AND EDUCATION.**

(a) In respect of technicians the honourable member is referred to table 7.3.1., page 237, and universities to table 8.2.5., pages 248-250, of the 1984 annual departmental report.

(b) The examination results for 1984 are not available

*Howard Q 61 462*  
 7/3/85  
 354 Dr M S BARNARD asked the Minister of Health and Welfare:

- (1) Whether any visits were made by State doctors in 1984 for the purposes of examining persons detained in terms of security legislation, if not, why not, if so,
- (2) Whether records were kept of these visits, if not, why not, if so, how many visits were made in 1984,
- (3) whether any reports on such visits were submitted by State doctors to his Department in 1984, if so, how many such reports were submitted,
- (4) whether any action was taken by his Department as a result of such reports; if not, why not, if so, (a) in how many cases, (b) for what reasons and (c) by whom?

**THE MINISTER OF HEALTH AND WELFARE.**

- (1) Yes.
- (2) Yes, whenever required.
- (3) Yes, after each visit
- (4) (a) + (b)  
 Yes, whenever reports indicated the need for further action
- (c) By State Medical Officers and Specialists  
 Fish meal

361. Mr R R HULLEY asked the Minister of Agricultural Economics.



*Howard*  
 Children in prisons *Q. 671*  
 18/3/85

164. Mr D J DALLING asked the Minister of Justice.

How many (a) White, (b) Black, (c) Coloured and (d) Asian (i) male and (ii) female children in each age group were in prison with their mothers (aa) in 1984 and (bb) as at the latest specified date for which figures are available?

**THE MINISTER OF JUSTICE**

The ages of children who are accommodated in prisons with their mothers are not readily available, but range from infancy up to about 3 years of age, depending on the child's emotional and physical dependence on the mother.

(1) Children/infants who were admitted to prisons with their mothers or who were born in prison from 1 January 1984 to 31 December 1984

	(i) Male	(ii) Female
(a) White	9	6
(b) Black	1 475	1 560
(c) Coloured	290	223
(d) Asian	1	4
Total	1 775	1 793

(2) Children/infants who were in prisons with their mothers on 31 December 1984:

	(i) Male	(ii) Female
(a) White	2	2
(b) Black	88	119
(c) Coloured	27	16
(d) Asian	None	None
Total	117	137

In terms of Prisons Regulation No 94, a female prisoner may be permitted, subject to such conditions as are prescribed, to have her baby with her in prison during

the period of lactation and for such further period as may be necessary. The necessary clothing, food and medical treatment may be provided by the State for such period as a baby remains in prison.

Standing orders also determine that an infant may remain in prison with the mother for as long as deemed necessary for medical and feeding purposes. Thereafter it should be endeavoured to remove the child from prison, subject to a certificate by the medical officer to the effect that the child would not be harmed psychologically or physically if separated from the mother.

All infants are examined by the medical officer as soon as possible after admission to a prison or after birth in order to determine which medical treatment and food are to be prescribed. The infant's mass is taken monthly and the necessary injections and vaccinations as applicable are administered by a qualified nursing sister, or otherwise arrangements are made for the administration thereof at the local clinic.

**Children in prison**

165 Mr D J DALLING asked the Minister of Justice

(1) (a) How many (i) male and (ii) female children of 18 years and under in each race group were detained in prison during the latest specified period of 12 months for which figures are available, (b) into what age categories did they fall and (c) for what offences were they imprisoned in each case;

(2) whether any prisons have special facilities for children, if not, why not, if so, (a) which prisons (i) have and (ii) do not have these facilities and (b) what is the nature of these facilities in each case;

(3) whether the prison routine for (a) children and (b) juvenile criminals differs, if so, what is the nature of the routine in each case; if not, in what

*Howard*  
 Agricultural trainees *Q. 674*  
 18/3/85

respects does the routine for children differ from normal prison routine?

**THE MINISTER OF JUSTICE**

(1), (2) and (3) Statistics of this nature are not centrally kept and can therefore only be obtained by a country-wide survey which involves a substantial manpower input. Such a survey was conducted on 19 March 1984 of which detail was given in my reply to question number 950 of 11 June 1984.

(a) How many in-service training centres for agricultural trainees are registered with his Department, (b) what are their names, (c) where are they situated and (d) what number of agricultural trainees (i) attended and (ii) completed courses at each of these centres in 1983 and 1984, respectively?

**THE MINISTER OF MANPOWER:**

(a) 45	(b) Name of Training Centre	(c) Where situated
	Agriplas (Pty) Ltd	Bellville
	Apex Group Training Centre	Benoni
	Baynesfield Estates	Baynesfield
	Bloemfontein Group Training Centre	Bloemfontein
	Boeremakelaars Co-op Ltd	Port Elizabeth
	Boskop Training Centre	Boskop
	Ceres Fruit Growers Co-op Assoc Ltd	Ceres
	C G Smith Sugar Ltd	Durban
	Chandor Training Centre	Lupatardsvlei
	Deemster Farming (Pty) Ltd	Gumtree
	Elgin Fruit Packers Co-op Ltd	Elgin
	Emthonjeni Group Training Centre	Sidwell
	Fedmech	Vereeniging
	Ford Motor Co S A Ltd	Port Elizabeth
	G & J du Toit Farming (Pty) Ltd	Ceres
	H L Hall & Sons	Matatfa
	H L & H Forest Products Central Region	Piet Retief
	John Deere (Pty) Ltd	Nigel
	Karbochem	Newcastle
	Kromme Rhee Training Centre	Cape Town
	Langeberg Co-op Ltd	Cape Town
	Malcomess Ltd	Isando
	Midland Centre for Further Education	Nottingham Road
	Mondi Timbers	Sabie
	National Co-operative Dairies Ltd	Durban
	Noodsberg Sugar Co Ltd	Dalton
	Northern Group Training Centre	Silverton
	Pinetown Group Training Centre	Pinetown
	Reynold Bros Ltd	Durban
	Sabie Forestry Training Centre (Tims)	Sabie
	Sapecoe (Pty) Ltd	Tzaneen
	Sappi Management Services	Johannesburg
	Shell S A (Pty) Ltd	Cape Town
	S A Sugar Association	Mount Edgecombe
	S A Sugar Association (Experimental Station)	Mount Edgecombe



Sentraal Westelike Kooperasie (Pty) Ltd  
 Sentraal Westelike Kooperasie (Pty) Ltd  
 South Western Transvaal Agricultural Co-op Ltd  
 Tongaat-Hulett Group Ltd  
 Tongaat Sugar Division Group  
 Tromf Fertilizer (Pty) Ltd  
 Tromf Fertilizer (Pty) Ltd  
 Vaal Triangle Group Training Centre  
 Vetsak Head Office  
 Yellowstone Timber Holdings Ltd

Viljoenskroon  
 Klerksdorp  
 Leeudoringstad  
 Tongaat  
 Madsstone  
 Richards Bay  
 Potchefstroom  
 Vanderbijlpark  
 Isando  
 Piet Retief

(d) Statistics furnished by training centres do not distinguish between trainees on the basis of industries and particulars as requested under (i) and (ii) are not readily available

Agricultural trainees

244 Mr R W HARDINGHAM asked the Minister of Manpower

What amount of financial assistance was made available by his Department to each specified in-service training centre for agricultural trainees in 1983 and 1984, respectively?

The MINISTER OF MANPOWER

The following amounts were made available to the Boskop Group Training Centre to promote training

1983 — R300 000  
 1984 — R150 000

In terms of Section 11sept of the Income Tax Act, 1962, expenses incurred by employers in respect of approved training qualify for a tax concession. This concession is also applicable to employers in the agricultural sector. Furthermore employers making use of approved training at Group Training Centres receive a rebate of 75 percent on the course fees in lieu of a tax concession. The rebate is also applicable to employers in the agricultural sector. The rebate came into operation on 1 October 1984 and one million rand was allocated for rebates on training at Group Training Centres for the 1984/85 financial

year. The amounts pertaining to tax concessions and the rebate for the agricultural sector cannot be determined from the available data.

*Heusard*  
 Prison warders' assault  
 Q. 601. 676 18/3/85  
 292 Mrs H SUZMAN asked the Minister of Justice

- (1) Whether any charges of assault were laid by prisoners against prison warders in 1984, if so, how many charges,
  - (2) whether departmental inquiries were held into these charges, if not, why not, if so, what were the findings,
  - (3) whether any persons were convicted, if so, how many?
- The MINISTER OF JUSTICE
- (1) Yes, a total of 1 241 complaints were received

(2) Yes, in terms of the Standing Prisons Service Orders, every complainant of assault must be properly investigated by the Commanding Officer and the report of the investigation and his finding and recommendation must be forwarded to the Commissioner of Prisons together with a medical report indicating the nature and extent of the injury, if any. In respect of 908 complainants no substance could be found to institute any charges against any member of the Prisons Service. Of the remaining 333 complainants a

total of 55 were handed to the South African Police for further investigation while 278 complainants resulted in departmental trials in terms of Prisons Regulation 71(1)(hh) read with

section 53 of the Prisons Act, 1959 (Act No 8 of 1959)  
 (3) The findings regarding the formal charges were as follows

Trials in terms of Prisons Regulation 71(1)(hh), read with section 53 of the Prisons Act

	No of members involved	No of complainants
Number of convictions	122	117
Number found not guilty	110	102
Findings outstanding/pending	63	59
TOTAL	295	278

Charges investigated by the South African Police.

	No of members involved	No of complainants
Number of convictions	6	6
Number found not guilty	8	8
Cases in process of finalization	6	4
Cases in which the Attorney-General instituted prosecution	20	18
Cases in which the Attorney-General refused prosecution	62	26
Results of SA Police investigation and/or Attorney-General's decision outstanding	16	11
TOTAL	98	55
GRAND TOTAL	393	333

Robben Island

Bayhead: parcels/goods cartage

294 Mrs H SUZMAN asked the Minister of Justice.

321 Mr W V RAW asked the Minister of Transport Affairs.

Whether any persons under the age of 18 years are being held in prison on Robben Island at present, if so, (a) how many, (b) what are their respective ages and (c) of what crimes were they convicted in each case?

The MINISTER OF JUSTICE  
 No, (a), (b) and (c) Fall away

(2) whether consideration has been or will be given to allowing the private sector to subcontract for such a service, if not, why not, if so, what steps



Howard

MONDAY, 18 MARCH 1985

Children in prisons Q. 61 671

18/3/85  
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HoA

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Howard

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18/3/85  
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(b) Name of Training Centre

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C G Smith Sugar Ltd	Durban
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Elgin Fruit Packers Co-op Ltd	Elgin
Emthonjeni Group Training Centre	Sidwell
Fedmech	Vereniging
Ford Motor Co. S A Ltd	Port Elizabeth
G & J du Toit Farming (Pty) Ltd	Ceres
HL Hall & Sons	Matafin
HL & H Forest Products Central Region	Piet Retief
John Deere (Pty) Ltd	Nigel
Karbochem	Newcastle
Kromme Rhee Training Centre	Cape Town
Langeberg Co-op Ltd	Cape Town
Malcomess Ltd	Isando
Midland Centre for Further Education	Nottungham Road
Mondi Timbers	Sabie
National Co-operative Dairies Ltd	Durban
Noodsberg Sugar Co. Ltd	Dalton
Northern Group Training Centre	Silverton
Pinetown Group Training Centre	Pinetown
Reynold Bros. Ltd	Durban
Sabie Forestry Training Centre (Tims)	Durban
Sapecoe (Pty) Ltd	Sabie
Sappi Management Services	Tzaneen
Shell S A (Pty) Ltd	Johannesburg
S A Sugar Association	Cape Town
S A Sugar Association (Experimental Station)	Mount Edgecombe
	Mount Edgecombe

HoA



Sentraal Westelike Kooperasie (Pty) Ltd  
Sentraal Westelike Kooperasie (Pty) Ltd ...  
South Western Transvaal Agricultural Co-op Ltd.  
Tongaat-Hulett Group Ltd  
Tongaat Sugar Division Group  
Tromf Fertilizer (Pty) Ltd  
Tromf Fertilizer (Pty) Ltd  
Vaal Triangle Group Training Centre  
Vetsak Head Office  
Yellowstone Timber Holdings Ltd...

Viljoenskroon  
Klerksdorp  
Leondoringstad  
Tongaat  
Mardstone  
Richards Bay  
Potchefstroom  
Vanderbylspark  
Isando  
Pret Retief

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HoA

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The MINISTER OF JUSTICE

No, (a), (b) and (c) Fall away

#### Bayhead parcels/goods cartage

321 Mr W V RAW asked the Minister of Transport Affairs

(1) Whether consideration has been given to extending the parcels and goods cartage service from Bayhead to Durban North, if so, with what result, if not, why not,

(2) whether consideration has been or will be given to allowing the private sector to subcontract for such a service, if not, why not, if so, what steps

HoA



says financial director Roger Keene Thrupps's most expensive item, which still sells, says Keene, is a small pot of Russian caviar priced at R109 He says a decrease of

about 4% in 1985's turnover, in real terms, can be expected, but on the whole his type of customer is "loath to change his habits, even in a recession"

Perhaps the main strength of exclusive outlets is best expressed by Spitz who says his customers believe "cheap is expensive — quality lasts"

## UNIVERSITY RESEARCH

# Moving to the coalface

179A

FEATURE

Wits University has come down from its ivory tower and is dirtying hands on the factory floor to advance SA's industrial sector

Wits Science Park's UWtec, opened officially this week, is well advanced on vital research projects with direct and immediate benefit for business. The new body is made up of the university's Materials Handling Institute and Mechatronics division, both of which grew through industry-related projects and Wits' determination to become more actively associated with industry.

The park in Sandton houses hundreds of metres of pipelines, massive industrial plant, robots in full-size warehouses — and a 14 m aluminium semi-trailer. While it is a unique feature in SA, similar facilities are common in other parts of the world.

Real, live industrial research is probably every university's pipe-dream, but Wits' park has seen this become a reality. Companies are bringing their plant or machinery to the park for research, or asking Wits to build it for them from scratch.

The two-year-old facility has come of age — and has already produced valuable results for both SA industry and overseas companies. "While the concept is common overseas, only around 30% of such parks are successful," says Roy Marcus, dean of the Wits engineering faculty and director of the park.

He says Wits has learned from the failures and it looks like being a success. "We concentrate on direct interfacing with industry so that companies are kept in close touch with research. Contracts are drawn up to ensure continual feedback on progress."

"The park acts as a working showroom for companies wanting to demonstrate their equipment to potential customers and our staff are constantly working with it," he adds. Future plans are for more engineering divisions, including metallurgy, to start projects there.

The park is dealing mainly with short-term work, as companies often need solutions fast. But like any university, Wits must do medium and long-term research and development (R & D) of new products or techniques. "Too often universities trail behind industry as they can't afford R & D. But, with close co-operation, we hope to come up with new ideas," says Marcus, who believes universities have the brain-power to operate hand-in-hand with industry.

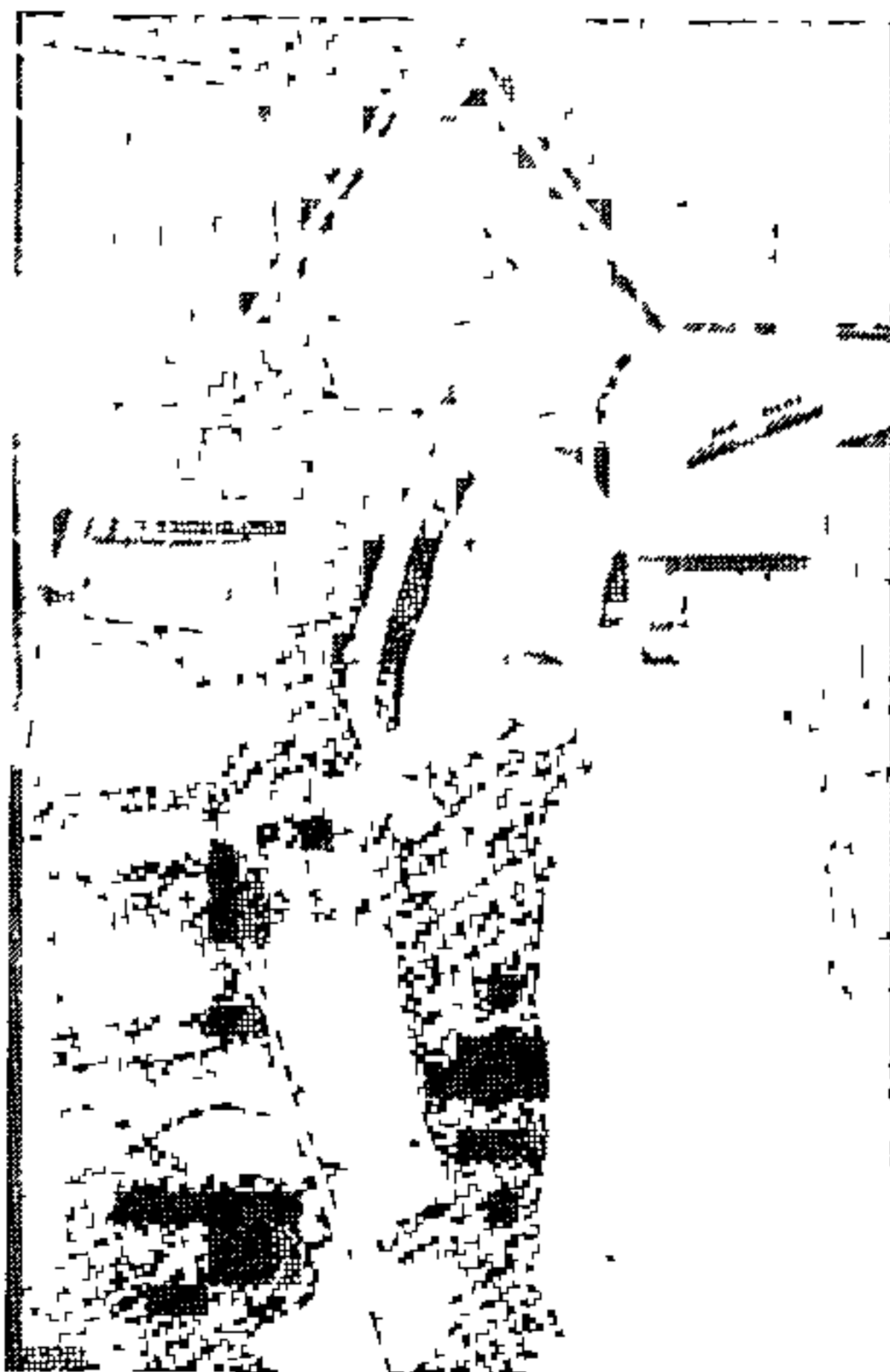
One problem at similar set-ups elsewhere is that academics have used them to "line

their own pockets" Marcus gives the assurance that the Wits facility will keep open books detailing exactly where money went. This year the park's R1,2m budget has a R400 000 shortfall, but Marcus is hoping that sufficient work will flow in to save the day.

"Industry is slowly realising that this facility is often more cost-effective than research programmes undertaken by national research bodies — and it can be quicker."

"We don't compete with commercial consultants, preferring to work with them so that we each use the other's facilities. We can't afford to bite the hands that feed us."

Unlike many overseas facilities, Wits has the space (450 ha) to use full-scale equipment and this has helped draw work from



UWtec's Marcus ... into industry

Germany, the US and Australia. Using real-life equipment means the park doesn't have the expense of scaling-down models. Off-the-shelf supplies are used and results may be directly translated to the real environment which adds credibility.

Wits has offered land to companies to start their own R & D facilities on the site on the same basis as it has contracts for other work.

One of the park's most ambitious projects was the revolutionary 30 t aluminium semi-

trailer for the transport industry. Companies involved in the development included Huletts Aluminium, Alusuisse, Henred Fruehauf, Michelin, Bosch, John Sims Associates and Motolek.

The trailer was designed from scratch and will carry up to 30 t. "It represents technology not readily available in SA," says Marcus.

West Germany's Karl Brieden came to the park to test its new process of transporting highly abrasive materials like gold ore and fly ash from power stations by pipeline. This was closely monitored for 10 weeks and will be marketed in SA and Germany.

Another pipe project involved NEI John Thompson of Australia. The company gave Wits specifications for a system to carry 200 t/hour of dry cement powder over long distances because it had no experience in the field. The system has now been manufactured and successfully installed.

A major breakthrough in fly ash disposal was also developed for NEI at the park. Transportation of the ash was tested and, on the strength of the investigation, the company was awarded the contract for the system at Callide B power station in New South Wales.

JCI, in collaboration with the park, has developed a back-fill system for mines. More than two years have been spent developing the paste-pump technology which will strengthen underground workings in the place of wooden or hydraulic props, decreasing the incidence of rock bursts. Preliminary trials are complete and JCI will implement the system in a few weeks.

The park helped to cut Anglo Alpha Cement's demurrage costs drastically by increasing the diameter of the discharge pipes used to offload rail tankers. Previously, 40 t/hour was offloaded, but the volume was increased to 150 t/hour, and the system is now in use throughout SA.

The park has also been involved extensively in researching high technology in warehousing with companies such as Intech Reunert, Grimaker Projects, Demag, Acrow and Symo.

"We wrote software for very specialised computer simulation programs which provides the information necessary for the correct siting, size and level of automation in the warehouses — right down to whether the company needs a warehouse at all," says Marcus.

Many of the warehouses are already in advanced stages of construction.



179

**Plans shelved for Pietermaritzburg college**

# Chatsworth to get a technical college

THE first of five technical colleges earmarked for Indians would be built in Chatsworth, Mr Kessi Ramduth, Minister of Education and Culture in the House of Delegates, announced yesterday.

He said land for the ultra-modern school at Chatsworth had been acquired and work on the building was expected to start shortly.

'We had originally planned to provide Pietermaritzburg with the first technical college at Northdale, but we had to shelve the plan because of the problem of a suitable site,' he said, adding that because of the delay it had been decided to divert the available funds towards the Chatsworth project.

### Priority

Mr Ramduth said the provision of technical colleges and schools at all Indian growth points in the country was a five-year project.

'We have also decided to give priority to Richards Bay where there is no school or a technical college for Indians,' he said.

The minister also announced that his department was looking at the methods used in determining the promotion of an Indian teacher.

'I am awaiting a report on the criteria used and once we have studied it we will decide whether the method should be scrapped or amended,' Mr Ramduth said.



W. Cron 3/4/85  
79

# Big expansion programme for Indian technikon

**Mercury Reporter**  
DURBAN'S M.L. Sultan Technikon has embarked on a massive expansion programme in spite of the recession, the Rector, Mr A Ramsamy, said in the technikon's annual report, released yesterday.

He said in spite of the difficulties facing the country's economy the technikon had to prepare itself for the increased demand for trained manpower.

'Although the difficulties may appear to be insurmountable, we must think positively. Depressions have come and gone. The tide must change and when the tide does change we must not be caught napping,' he said.

## Demands

Trained manpower would be the order of the day. 'We must train our youth now so that we will have what is necessary to restore equilibrium to the economy of the land.'

He said it was during times of recession that the demands on educational institutions increased. To meet these demands the technikon had embarked on its expansion programme 'at a time when economic activity is at its ebb'.

Mr Ramsamy said with the House of Delegates now taking over control of all matters affecting Indians it was hoped that the House would provide the

technikon with the means to develop.

'The technikon will not have to continually struggle against cutbacks to keep in line with other technikons which were able to grow unhindered in the past

'Many problems will have to be resolved by the House of Delegates. Some are the provision of funds for the general growth of the technikon, and need for additional land for the extension of the present campus,' he said.

Registrar Mr Runjith Jagath said the enrolment of full-time tertiary students increased from 500 in 1974 to 2 400 in 1984. The current expenditure of the technikon increased six-fold in the same decade while fixed assets jumped from R2 500 000 to R13,5 million.

AKW 2/1/85

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# Plan to boost farm workers' potential

Tygerberg Bureau

A TRAINING programme aimed at giving farmers greater management skills and developing greater promotion potential for farm labourers has been announced by the Western Province Agricultural Union.

Mr Frans Maan, chairman of the union said the programme would be run with the Rural Foundation which, he said, had already achieved remarkable success in its countrywide training programme for farm labourers.

Research has found that a course in pruning was the greatest single need and that the development of supervisory, management and labour relations skills were also required.

Mr Jannie le Roux, a spokesman for the union said that better-educated farm labourers had a tendency to migrate to the cities for higher-paid industrial jobs and that those who re-

mained being therefore were the least educated members of their community.

Training programmes should be instituted to develop this human potential remaining behind on the farms.

"White farm managers are becoming scarcer and more expensive and we could with these new training programmes also create managerial jobs for farm labourers," he said.

"Another way in which labourers are already being given more say is through the workers committees now developing on farms. These committees also give farm workers greater skills in negotiating and management," he said.

The proposed courses are being put together by the University of Potchefstroom, the Boskop Training Centre and the Rural Foundation while audio-visual aids will be provided by the KWV, Stellenbosch Farmers' Winery and Oude Meester.



# Automation cuts staff and costs

21/4/81 S. Tuis

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STANDARD Bank has been innovative in its drive to integrate human and non-human resources to improve productivity.

Having won one of the National Productivity Institute's 1984 awards, the bank has committed itself to a continuing productivity improvement programme.

One area in which the programme has paid off is the stabilisation of the growth of its work force.

But the programme was not easy to implement because of the nature of the bank's business.

## Resource

Denzil Busse, general manager, management services at the bank, says "Because there is no clear distinction between the product and service in banking, our approach included not only modern technology but our most important resource — employees."

Because of increased job differentiation the bank was becoming an administrative monster. The organisation and methods department was formed to counter the trend and to boost productivity.

Mr Busse says "The O&M's task was to maximise effectiveness through the most efficient use of human and non-human resources."

"We have integrated these two resources, resulting in improved productivity. The result is a turnaround in trends noticed before 1980 when the rate of growth in our manpower complement exceeded rate of output."

"We have seen a real decline in growth in manpower against percentage growth deposits. Although staff figures have declined, it would be incorrect to assume that automation leads to redundancies. Automation contains the rate of hiring and so allows effective employee use."

By Amrit Manga

"Of greater significance is the fact that manpower growth declined between 1982 and 1984. An analysis shows that where we achieved staff economies by closing unprofitable branches, we were able to invest those resources in new business activities."

"Based on reported figures that banks' staff complements increased by 6.2%, we must conclude that other banks have not enjoyed the same productivity improvement as we have."

"Although expenditure on automation increased, we contained growth in fixed property expenditure — primarily branch premises."

"The bank's achievements are not confined to commercial banking operations. In 1981 we automated the processing of vouchers for our card division. The benefits were enormous and we have cut the staff complement by 50%."

## Flexible

Mr Busse says "Besides the direct savings from our investment in automation, we have reaped the benefit of improved decision making and planning, more effective control of resources while retaining our flexible approach to serving the changing needs of customer groups."

"Productivity is an important component of our profitability measurement system and features in our overall integrated management system."

"We will increasingly focus our attention on quality circles, computer-based training and research into office automation."

"With regard to quality circles we believe that the involvement of the individual in decision making and improving methods of work is essential."

Neville Gericke, head of

the bank's work measurement division, says "When we undertook the productivity exercise in 1982, our card division was one of the largest administrative divisions in terms of staff numbers. Being a labour-intensive operation, it was recognised as a potential area for productivity improvement."

"We set out by identifying weak, ineffective and costly systems. We assessed work loads and implemented cost-effective productivity systems to bring about equality in work-load distribution."

"Each staff member was interviewed and asked to suggest ways in which the job could be made easier."

## 50% cut

"Members of the staff undertook exercises to establish standard times for work they did. We calculated the first productivity ratings for each individual post."

"Action was taken in three main areas — skills improvement, work-load reduction and research and development."

The result was a reduction in the staff complement of almost half. The continuing effective cost savings to the credit card department are estimated at R250 000 a year.

A 93% improvement in productivity was achieved once all the improvement measures were implemented, says Mr Gericke.

Coupled with other productivity gains the overall savings amount to R700 000 a year.

Mr Gericke attributes the gains to the staff's commitment to productivity growth. "Also the labour-intensive nature of the operation allowed for immediate work-load reduction, research and development."

179

Star

25/4/85

# Important report on artisan training tabled

The academic orientation of South Africa's education system is one of the chief causes of shortages in the country's technical manpower

This view is expressed in the report on artisan training which was tabled in Parliament today by the Minister of Manpower, Mr P T C du Plessis

The report is a result of an investigation commissioned by the Government in 1982 and carried out jointly by the Human Sciences Research Council and the National Training Board. The investigation follows recommendations by the Wiehahn Commission on labour legislation in South Africa

Says the report "One of the most important reasons for the acute shortage of technically and technologically trained workers in South Africa can be attributed to the present education systems.

"The main complaint about (it) is its academic content (which) has always been designed to prepare pupils for admission to universities. In this way the empha-

sis is on academic-oriented general formative education, which has caused a shameful neglect of career-oriented formative education"

This results, says the report, in a tendency to look down on manual work and practical skills

Also found to blame for shortages in technically skilled manpower were inadequate career information and guidance and artisans' lack of social status

This, the report says, could be corrected through improved guidance at school and positive promotion of artisanship through the media

## ECONOMIC CYCLES

Turning to the present training system, the report says it has led to an imbalance in the supply and demand for apprentices because of the effect of economic cycles on apprentice intakes

The report calls for the continuous adaptation of apprentice training schedules and points out

the necessity of greater trade union involvement

A phasing out of the reduction in the training period for ex-servicemen in adult training centres is also recommended

Saying the present training systems do not always produce artisans of the required quality, the report suggests the revision of training methods by

- The conversion of the present time-based system to a performance-based one, where modular training would play an important role

- The establishment of artisan training boards for each industry to replace the existing manpower training committees, with the boards controlling training in the individual industries

- The rationalisation of the number of trades at the industries' initiative

- The establishment of co-ordinating committees between technical colleges and industry to facilitate a closer relationship between theoretical and practical training



CITY/CAPE

ARGUS 25/4/85

179

# Changes likely in training of artisans

## Stellenbosch

Labour Reporter

MAJOR changes in the training of artisans have been recommended in a Human Sciences Research Council and National Training Board report tabled in Parliament today after a two-year investigation

It was undertaken against a background of a "relatively large shortage of artisans in most trades. There is still a rather small flow of black apprentices to industry which the NTB feels needs further attention".

The wide-ranging report — compiled by a committee which included representatives of trade unions, Government, industry, educationists and the HSRC and NTB — covers the whole field of artisan training, including its history, and overseas developments

### Alternatives

Major recommendations are that:

- The present time-based training system should be converted to a performance based system
- Each industry should establish its own artisan training board to replace existing manpower committees
- Rationalisation of the number of trades should take place with industry taking the initiative.
- All artisan training should be evaluated by proficiency tests and the attainment of artisan status by effluxion of time should be phased out

Dealing with the present system of testing and evaluation, the committee concluded that it no longer fulfilled all the needs and requirements of industry.

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NM 26/4/85 (179)  
**'Pressing need in  
S A for  
trained manpower'**

Mercury Correspondent

CAPE TOWN— One of the most pressing needs in South Africa, plagued by many large economic, monetary and political problems, is 'a reasonable supply' of trained manpower from all population groups to improve productivity

This is the view of the chairman of the Human Sciences Research Council/National Training Board investigation into the training of artisans, whose report was tabled in Parliament yesterday by the Minister of Manpower, Mr Pietie du Plessis

The results of the analysis of the training of artisans, the report says, indicates that the various systems do not always produce artisans of the required quality and a revision of the present system is needed

Some of the major recommendations are that

● The present time-based training system should be converted to a performance-based training system in which modular training should play an important role,

● In order that decision-making on training be brought to the level where training takes place, it is recommended that each industry should establish its own artisan training board to replace the existing manpower training committees.

The main functions of these boards will be aimed at the structuring of and control over artisan training in that industry.

Rationalisation of the number of trades should take place and industry should take the initiative, the report says

It also recommends that a closer relationship between theoretical and practical training must be established and for this purpose co-ordinating committees between technical colleges and industry should be established or extended where needed

Another is that institutionalised training should be propagated further and trade theory should be presented together with the practical training



1363

WEDNESDAY, 1 MAY 1985

*House card*

1364

new Medical School at the University of the Witwatersrand and for the extension of the faculty of Veterinary Science at the University of Pretoria

The subsidies payable in respect of interest on and capital redemption of state and private loans have not been taken into account

*House card Q. Co. 1. 1363*  
*30/4/85*  
Mr H E J VAN RENSBURG asked the Minister of Education and Culture

- (1) How many (a) farm schools, (b) farm school teachers and (c) farm school pupils were there for Whites in the Republic at the end of 1984,
- (2) what was the per capita expenditure, (a) including and (b) excluding expenditure of a capital nature, on farm school pupils in the 1983-84 financial year?

The MINISTER OF EDUCATION AND CULTURE.

- (1) There are no farm schools under the jurisdiction of the Department of Education and Culture. Farm schools are the responsibility of the provincial education departments which are still administered in terms of the Provincial Government Act, 1961 (Act 32 of 1961). The number of (a) farm schools, (b) farm school teachers and (c) farm school pupils as well as the per capita expenditure are therefore a domestic matter
- (2) Falls away

WEDNESDAY, 1 MAY 1985

†Indicates translated version

For written reply

General Affairs

HoA

*179* Trades: training courses *Q. Co. 1. 1364*  
*1/5/85*  
Mr K M ANDREW asked the Minister of Education

How many Blacks were enrolled in 1984 for courses offering training as (a) welders, (b) electricians, (c) carpenters, (d) motor mechanics and (e) blasters?

The MINISTER OF EDUCATION

- (a) 176
- (b) 328
- (c) 200
- (d) 187.
- (e) None

Commissions/departmental committees

411 Mr K M ANDREW asked the Minister of Home Affairs

- (1) How many (a) commissions and (b) departmental committees of inquiry were appointed in respect of the Commission for Administration in 1984,
- (2) Whether any of the reports of such commissions and committees have been completed, if so, (a) how many and (b) of which commissions and committees,
- (3) whether any of the reports of such commissions and committees have been made public; if so, (a) how many and (b) of which commissions and committees,
- (4) what is the total estimated cost relating to each of these commissions and committees?

The MINISTER OF HOME AFFAIRS.

- (1) (a) and (b) None
- (2) to (4) Fall away.

1365

WEDNESDAY, 1 MAY 1985

1366

*House card*  
*Q. Co. 1. 1365*  
*1/5/85*  
Schools closed

555 Mr P G SOAL asked the Minister of Co-operation, Development and Education:

- (1) (a) How many schools administered by his Department were closed in each region as at the latest specified date for which figures are available, (b) what were the reasons for the closing of each such school and (c) how many pupils were there in each such school,
- (2) whether any of these schools will be reopened, if not, why not, if so, (a) which schools, (b) when and (c) what steps are being taken to reopen them?

The MINISTER OF CO-OPERATION, DEVELOPMENT AND EDUCATION.

- (1) (a) No schools are at this stage officially closed by the Department. There are schools where—
  - (i) classes have been suspended temporarily, and
  - (ii) pupils are boycotting
 In respect of (i) and (ii) the data is as follows
  - Cape Region 18 schools
  - Highveld Region 16 schools
  - Orange-Vaal Region 1 school
  - OFS Region 5 schools
  - Northern Transvaal Region 1 school
  - Natal Region. None
  - Johannesburg Region None

- (b) Circumstances and alleged reasons for boycotting differ from school to school. Reasons for boycotting range from fear of victimization to attendance of court cases

(c) Cape Region 12 141 pupils  
Highveld Region 12 984 pupils  
Orange-Vaal Region 1 200 pupils

OFS Region 5 592 pupils  
Northern Transvaal Region 1 238 pupils  
Natal Region None  
Johannesburg Region None

- (2) Yes
  - (a) All schools are still open
  - (b) As soon as students stop boycotting the schools
  - (c) (i) Continual consultation with governing bodies and school committees is taking place
  - (ii) Any real difficulties receive immediate attention

Data as on 6 March 1985

*House card*  
*Q. Co. 1. 1366*  
*1/5/85*  
678 Mr R W HARDINGHAM asked the Minister of Co-operation, Development and Education

What was the cost to his Department of the subsidization of farm schools in 1984?

The MINISTER OF CO-OPERATION, DEVELOPMENT AND EDUCATION.

Subsidies for farm school buildings amounted to R1 973 847,00 in 1984

*1/5/85*  
Port Natal/Drakensberg Administration Boards  
*House card*  
*Q. Co. 1. 1366*  
728 Mr R W HARDINGHAM asked the Minister of Co-operation, Development and Education

What were the administration costs in respect of each specified Black township administered by the (a) Port Natal and (b) Drakensberg Administration Board for the 1978-79, 1979-80, 1980-81, 1981-82 and 1982-83 financial years, respectively?

HoA



WEDNESDAY, 1 MAY 1985

*Hansen*

1364

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The subsidies payable in respect of interest on and capital redemption of state and private loans have not been taken into account

*Hansen Q 6/1 1363*  
*Farm schools 5/4/85*  
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16 MINISTER OF EDUCATION AND CULTURE

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(2) Falls away

WEDNESDAY, 1 MAY 1985

Indicates translated version

For written reply

General Affairs

1104

1364

*179* Grades, training courses *Q 6/1 1364*  
*1/5/85*  
151 Mr K M ANDREW asked the Minister of Education

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(4) What is the total estimated cost relating to each of these commissions and committees?

The MINISTER OF HOME AFFAIRS

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(2) to (4) Fall away

1365

*Hansen*

WEDNESDAY, 1 MAY 1985

1366

*Q 6/1 1365*  
*Schools closed 1/5/85*  
555 Mr P G SDALE asked the Minister of Co-operation, Development and Education

(1) (a) How many schools administered by his Department were closed in each region as at the latest specified date for which figures are available, (b) what were the reasons for the closing of each such school and (c) how many pupils were there in each such school,

(2) whether any of these schools will be reopened, if not, why not, if so, (a) which schools, (b) when and (c) what steps are being taken to reopen them?

The MINISTER OF CO-OPERATION, DEVELOPMENT AND EDUCATION

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*1/5/85*  
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*Hansen Q 6/1 1366*  
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What were the administration costs in respect of each specified Black township administered by the (a) Port Natal and (b) Drakensberg Administration Board for the 1978-79, 1979-80, 1980-81, 1981-82 and 1982-83 financial years, respectively?



# Blacks start to train as artisans

179  
Slow  
6/5/85

By Sheryl Raine

The first group of black artisan trainees began training at the Chamdor Training Centre on the West Rand today to become qualified electricians, builders and mechanics

Officially launched by the Minister of Manpower, Mr PTC du Plessis, the training programme involves 56 trainees drawn from the greater Soweto region. There were 1 440 applicants.

Until now there have been formal Government-sponsored training programmes only for whites, coloured people and Indians.

Mr C M Burton-Durham, chairman of the governing body of the Chamdor Training Centre and secretary of the southern Transvaal region of the Motor Industries Federation, said a new process in the political and economic history of the country had begun

He hoped that the trainees would ultimately gain similar rights and privileges in the social and political fields

The black trainees will be paid the same weekly allowances as other race groups — from R48 a week for a trainee with no dependants to R78 a week for a trainee with two or more.

Mr du Plessis told the trainees. "Phase one of your training, lasting one year, consists of theoretical and practical training by qualified and experienced instructors up to the N2 theoretical level

The second phase will be in-service training by an approved employer"

# Big fund to aid skills training

179

E. Post

25/5/85

THE Eastern Cape is due to get a multi-million rand injection to help ease its grave unemployment and skills shortage problems

Mr Bill Hayward, chairman of the governing board of PE's "Emthonjeni" Group Training Centre ("fountain of learning") said this week the training centre expected an amount of some R2 million to further

subsidise its multi-racial skills training programme

The funds would come from an amount of about R20 million allocated to the Department of Manpower and Training from a R100 million job-creation programme announced in Cape Town by State President Mr P W Botha earlier this month

In addition to this allo-

cation to Emthonjeni — one of nine "group" training centres registered with the Department of Manpower — an unquantified sum will be available on request from the Department of Manpower to private company-based training centres in the PE/ Uitenhage complex registered with the Department

The money allocated to Emthonjeni would be used to pay course fees for unemployed workers wishing to become qualified in a wide variety of skills, including bricklayers, carpenters, plumbers, painters and decorators, electricians aids, motor repair workshop assistants, storemen, sales assistants, domestic workers and drivers of all classes of vehicles

In addition to having their course fees paid, trainees over the age of 18 years will receive a subsistence allowance of R2,40 per day plus bus fares to and from the Emthonjeni Training Centre

This special programme aimed at training unemployed people will be administered in conjunction with Emthonjeni's long-established workseekers training programme. However, whereas the workseekers programme is limited to attendants under the age of 30 years, and with educations of Standard 6 and lower, the new programme will be open



By Louis  
Beckerling  
Business Editor

to men and women of all ages and educational qualifications

According to Mr Hayward a total of 1 300 trainees were equipped with a variety of skills by Emthonjeni's workseeker training programme last year. A proposed R700 000 expansion to the centre (for which Mr Hayward this week negotiated a loan at 16,75% repayable over 20 years with the Department of Manpower and Training) would boost this capacity to about 1 500 this year.

"And now, in addition to this programme, we will be able to accommodate about 300 trainees per week in a new programme aimed at assisting unemployed people in acquiring the necessary skills to make them re-employable."

The R20-million fund al-

located to the Department of Manpower is to be administered by a special committee chaired by Dr Piet van der Merwe, director general of the Department of Manpower and Training. Mr Hayward is the representative on the committee of the nine group training schemes, and other members include the chairman of the National Training Board, Mr Steve Naude, Mr L P Bartell, president of the Afrikaanse Handelsinstituut, Mr Lou Davis of the Building Industries Federation (representing private-sector training schemes), and the Registrar of Manpower, Mr R Dyman.

Half of the R20 million allocated from the R100 million job-creation programme is destined for the nine group training centres throughout the country (from which Emthonjeni is now to benefit), and the remainder will be available to approved training centres operated by private companies.

Mr Fred Polacsek has been nominated as a liaison and co-ordinating officer for the Eastern Cape to advise local companies how to make use of the funds. Emthonjeni will also train on demand for local companies and seek to place graduates of its various training courses in those companies specifying what skilled workers they require.

FAVOURABLE FACTORS / ELEMEN



# Robots seen as saviours in battle for productivity

By ALAN PEAT

THE "intelligent" industrial robot will mark the first positive step into the second industrial revolution, say experts in the field of robotics.

Even the present range of robots, which find it difficult to discriminate between stone and steel, are a must if secondary manufacturing industry is to survive in frenetic international competition.

Says Dirk Desmet, MD of GEC Systems, Automation and Control, whose Robotics Company has an 80% share of the SA market: "Our secondary industry is in a state of crisis. We feel that part of the solution lies in better productivity through automation."

GEC's faith in the need for robots was shown last week when the company opened a R500 000 robot application centre at its Wynberg premises.

In local terms, the urge to automate to stay level with overseas competition falls foul of the need to maintain a high level of labour intensity to relieve SA's unemployment level.

"But," says GEC Robotics' Terry Rosenberg, "it is often not so much a case of fewer jobs because of robots, but rather no jobs if companies cannot compete internationally."

The worldwide trend is increasingly towards robots, with the exciting promise of their "intelligent" brothers just round the corner.

"Development of industrial robots over the last three years has been rapid," says Takasumi Minami, GM of the foreign trade division of Yaskawa and Company, one of the majors in Japan's 208-strong field of robot manufacturers and with a leading market share in arc welding robots.

"But this development has been primarily in the applications such as arc or spot welding.

"However, a sensory device needs to be developed before robots can be used for more sophisticated welding applications or in areas such as materials handling, deburring, fettling, cutting and grinding.

Robot research is presently examining sensors which go beyond the present controls of micro-switches, infra-red detectors and photo-electric cells to instruct the robot's movements.

"The manufacturers are now developing sensors which can react to proximity, force, a tactile effect or by vision."

The local market is still small; about 60 robots are now installed in various factories.

The unit price — from R50 000 to R180 000 for basic units, which can be doubled with ancillary equipment — has acted as a brake on local sales.

"But," says Rosenberg, "with workers demanding increases of anything up to double their present wages, any existing gap between the cost of automation and cheaper labour is bound to close. And robots can cover their cost in a very short time."

*D. The patch 29/3/85 (179)*  
**Training at Q'town**

QUEENSTOWN — The Emthonjeni Training Centre, of Port Elizabeth, intends establishing a temporary facility here next month to train unemployed people

The Queenstown Town Council has received a letter requesting minor assistance

Emthonjeni said it wanted to establish a centre here by June 3 to

train people in skills such as heavy duty driving, painting, basic building skills, storekeeping and security guard training

Emthonjeni said it anticipated receiving R1 million from the government to train unemployed people following the announcement that R100 million would be made available as a short-term emergency measure — DDR



NM 30/5/85  
**'Change needed in  
artisan training'**

179 Finance Editor

ARTISAN training needed to be changed from the system devised for Europe in the 19th Century, Mr J D Kritzinger, vice-chairman of the SA Sugar Millers' Association said yesterday

Speaking at the annual meeting he said that artisan training needed to be broken up into self-sufficient modules or units which would be recognised as qualifications.

Unless this was done they would not succeed in creating a happy, contented and productive work force

He was discussing a report by the Human Sciences Research Council on artisan training and said that while there were many excellent recommendations, they did not go far enough to meet the the particular needs of the country and the inherent characteristics of the peoples of South Africa

The proposal for module training made in the report had to be carried to its logical conclusion

It was of importance both to the sugar industry and the whole country and deserved a full examination and 'new look' at the requirements for training people.

# Employers slammed for failing to train workers

1/7/85 Star (179)

Employers who failed to take advantage of the financial incentive offered by the Government for worker training during the present economic slump, were criticised by the Deputy Minister of Home Affairs, Mr Ron Miller, today.

Mr Miller was speaking at the opening of Instructa '85, at the Rand Afrikaans University in Johannesburg.

He called on employers to train employees on a rotational basis, rather than retrench them because of the recession.

"The favourable financial incentives on approved training, which enable employers to recoup 87,5 percent of their

training costs in designated industrial development areas and 75 percent in other areas, are unfortunately not being fully utilised by employers to train their workers during the present lean period.

"Employers would do well to contribute to the upgrading of the skills of workers, especially those at the lower levels, by training them on a rotational basis rather than retrenching them," Mr Miller said.

The apparent practice by some employers of increasing staff training efforts during boom periods and reducing it in periods of economic downswing, had resulted in a shortage of qualified

artisans in high demand periods and unemployment in slack periods.

According to 1983 Department of Manpower statistics, the economically active population, excluding those in agriculture and domestic service, was 5 498 649.

Mr Miller said South Africa had to aim at a future yearly economic growth rate of about six percent if it were to maintain its strong position of industrial and commercial leadership in Southern Africa.

The State had accepted the responsibility of creating an institutional environment in which the training relationship between the employer and his employees could

flourish.

Mr Miller said that during 1984, 548 000 people underwent in-service training in courses approved by the Department of Manpower, which reflected an increase of 43 000 on the 1983 total.

He said he hoped the trend would continue in 1985 despite the downturn in the economy.

Noting trade union interest in artisan training, Mr Miller said it was encouraging that unions played an active and important role in the field of training.

He said the yearly intake of 12 500 apprentices was inadequate to cater for South Africa's future needs.



# Cheap labour myth stunts automation

THE myth that labour is cheap is hampering the growth of automation in South Africa, says a leading robotics supplier.

Hampo Systems' general manager Brian Jones said this misconception, coupled with the recession, accounted for the subdued state of the robotics industry.

"However an economic upturn, as well as increasing awareness of the role of robotics make the long term prospects appear good," said Jones

Robotics, automation and increased efficiency are being highlighted at the third International Manufacturing Efficiency and Plant Maintenance Exhibition (Pemex 85) which opened at the Crown Mines show grounds yesterday.

The show's emphasis falls on ways to cut manufacturing costs and how to utilise space, energy and materials for optimum efficiency.

A crowd-puller is the imported automated equipment being shown by Siemens. The products, along with three high-tech specialists, were brought out from Germany specifically for Pemex 85.

Several portable automated controllers — best used for manufacturing processes where varying speeds are required — are being demonstrated by the Germans.

Bavarian specialist Henneng Brunke said the introduction of automated controllers would lead to a maximum loss of five people.

"The emphasis of our equipment is

By CHERILYN IRETON

on energy and space-saving rather than labour cutbacks."

The equipment is simple to use and, once programmed, most workers can be trained as operators.

In line with the fair's cost-saving theme, ways to repair and maintain machinery are also on view.

"South Africa has been a throwaway society — the moment something wore out, it was replaced," said Neil Fraser a spokesman for Metco, a division of Welding Advisory Services "However, with the recession this attitude has changed, and companies are now looking at longer life for their equipment."

Metco are displaying several coating products which can restore worn metal parts.

Another trend visible at the exhibition is the constant inspection of the measurement and soundness of components.

## TWOFOLD BENEFITS

The benefits of this are twofold said SA Electro-Medical's manager, Alan Clavier. "If you use testing equipment once the product is made, you are sure your product is reasonably sound. However, it also enables you to pick up and correct problems occurring during the manufacturing process."

Non-destructive testing can be done by computerised measuring techniques, industrial X-rays, ultrasonic equipment and laser scans — all of which are on display.

# New training centre for unemployed

Dispatch-Reporter

EAST LONDON — A training centre for the unemployed opened at Bethelsdorp Technical College yesterday

The centre serves the Border area

A class for training low-level handcraft mechanical skills began with a class of 13 trainees all South African citizens, which were selected by the Labour department

The class instructor, Mr E Stagg, said the three-week class would include both practical and theoretical training "The class is oriented more toward practical training but you can't give the practical without a little theory"

Upon conclusion of the course, there would be a certificate awarded to those who successfully completed the test, the local co-ordinator, Mr Malcolm Beaton, said

The chairman of the centre's organising committee, Mr Alistair Lightbody, said the main objective was to make the trainees more employable "We are trying not to train into a vacuum so when they leave, they would be able to find work in the area for which they were trained"

The government made R100 million available for South Africa of which R25 million must go toward training of the unemployed and the other R75 million would go toward job creation, Mr Lightbody said.

The training could be set up on a non-profit basis by a registered institution or any other institution, he said

The Emthonjeni Training Centre in Port Elizabeth has contracted with the government to establish a similar multi-racial training centre in the Border

The chairman for the regional development advisory committee, Mr Max Phillips, said the training would be restricted to urban areas

A community committee established during the inaugural stage to launch the programme included representatives from the Department of Manpower, the Development Board, the chambers of commerce and industry, the Sakekammer, the municipality and technical colleges

The committee endorsed the need for training following a survey of local business to assess the needs of the area

Mr Lightbody said the present areas of instruction would include training for driving heavy articulate vehicles, training in semi-skilled aspects of building such as carpentry and brick laying, training in administrative areas such as security guards and storemen, and mechanical tools

The next course on brick laying will begin on Monday He said the courses for security guards and storekeepers would begin later, and there would still be much work before the vehicle training would begin

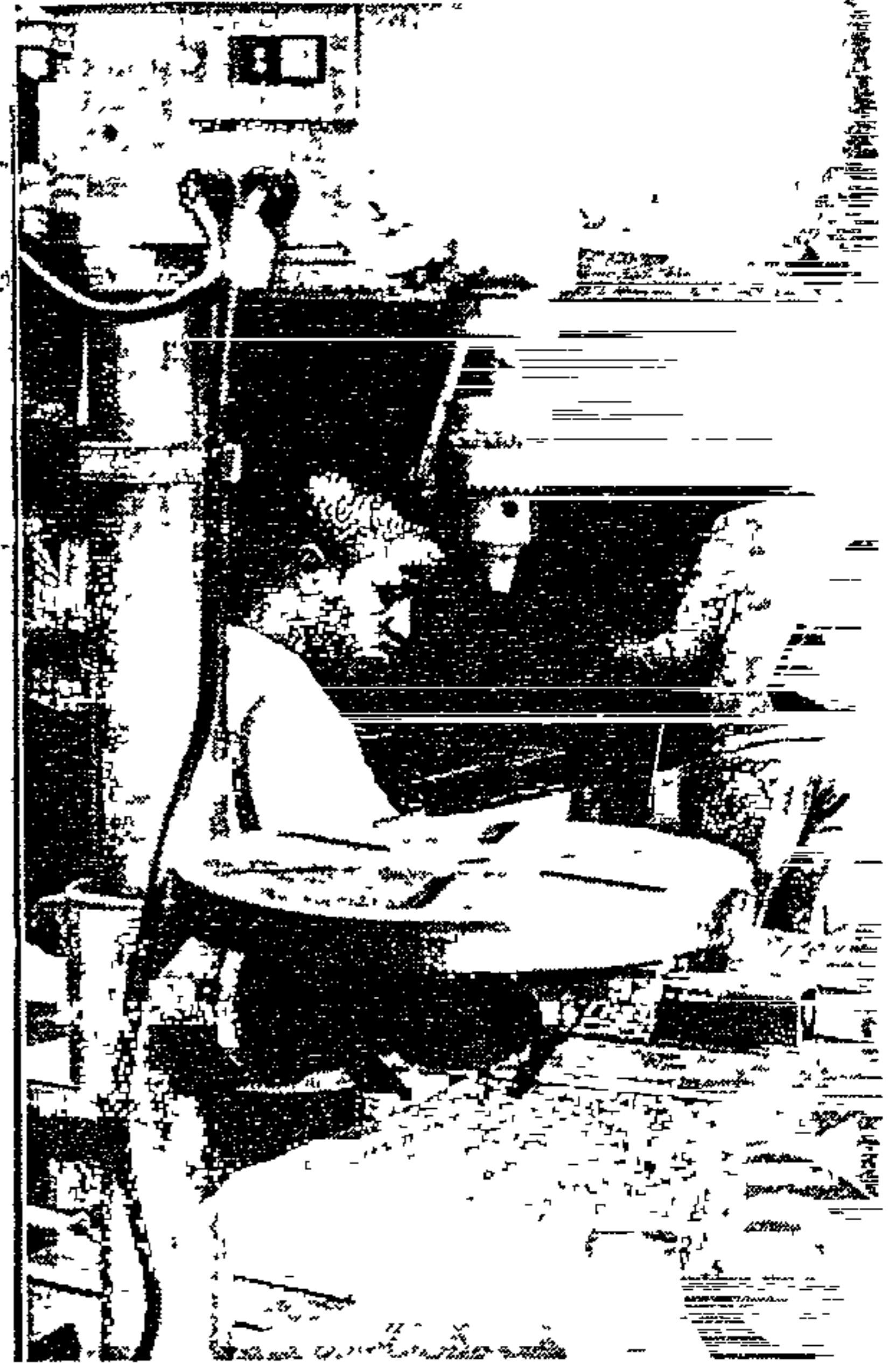
The trainees would be referred to the Eastern Cape Development Board and other contacts such as the Sakekammer and the Chambers of Commerce and Industry in hope of finding them employment, he said.

"The idea is for the trainees to use their new skills immediately because if they don't use them, there's a tendency to lose them"

He said appeals would be made to industrialists and commerce to use these people before using those off the streets



23-year-old trainee, gets a lesson from Mr E Stagg on the first day of border area training centre



Trainees at work at the Bethelsdorp Technical Centre mechanical skills



Politics favour 'made-in-SA'

# Mine equipment makers gearing up for change

By CHERILYN IRETON

GOLD mine mechanisation is boosting the activities of local mining equipment manufacturers

In anticipation of the swing away from politically-vulnerable and labour-intensive mining techniques, manufacturers are gearing their products and production lines for the changes

The most dramatic change already evident underground is the switch from traditional track equipment to the more flexible trackless machinery. Mining houses have discovered the laying of temporary tracks is both time-consuming and costly. The new heavy-duty but mobile equipment designed for assembly underground is considered to be more economic.

Other significant changes include adoption of the concept of continuous transport both underground and on the surface. Conveyor belt systems cut back on labour requirements, fuel costs and speeds up other work.

## CONTINUOUS TRANSPORT

"In open-cast mines, the continuous transportation concept has become very important," says Noel de Wet, MD of materials handling company PWH.

"In mining, the future lies in handling larger unit loads or units which can cater for the continuous flow of material."

The changes, however gradual they may be, mean more business for the equipment manufacturers. Unlike most industries, these companies have not been bruised by the recession and are adamant that it's business as usual.

Concor, which supplies packs and materials for support underground, was seriously affected by strikes and stoppages in the first six months of the year. Marketing manager Percy van Kerken says production at two factories was drastically affected during two months. There have been more than 100 strikes between January and June and of those 75% were on the mines.

"But even with the strikes, we are producing 20% more than last year," he says.

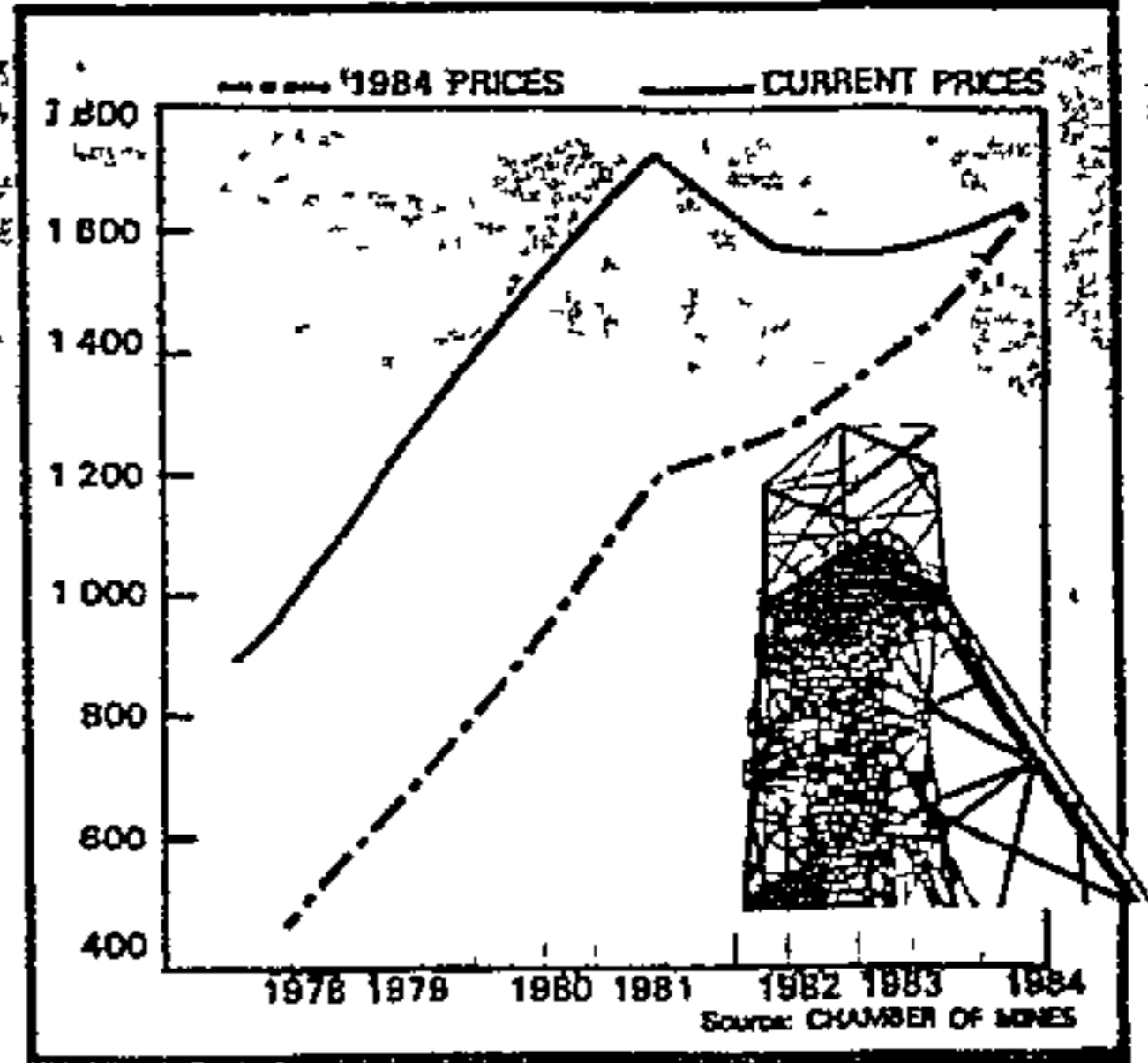
Coal mines were mechanised some time ago and at the moment the equipment market is not as active as that of gold, says Ian Heron, MD of Joy Manufacturing, a leading coal mining equipment manufacturer. "The boom days are over."

Coal mines spend almost 60% of their working costs on material and equipment. Gold mines lag behind with only around 35% going to capital goods.

The Chamber of Mines puts the total capital expenditure of gold and uranium mines at R1,645bn for 1984. This was up by R238m on 1983 and the figure is expected to climb by a further R317m this year. The chamber estimates that in the next six years, R11,914m will be spent on capital goods.

Hydro-powered mining equipment is another promising growth area for manufacturers. Although still new on the South African market, experts are predicting that this type of equipment could eventually lead to the phasing-out of pneumatic driven machinery.

CAPITAL EXPENSES BY GOLD & URANIUM MINES



"Waterjet drilling is ideal for soft and medium-hard rock. High-pressure water jets can outperform rotary drilling and the holes are smaller, more uniform and much quieter, safer and cleaner," says Jarvis Clarke MD Rick Gray. Jarvis Clarke SA is jointly owned by AECI and the Canadian-based parent company.

"South Africa is the largest potential market for mining equipment in the world," says Gray.

With volume up 50% on last year, his company has decided to set up a R3m local manufacturing plant. Cheaper labour, unfavourable exchange rates and prohibitive import costs are the reasons behind the new plant. From here the company plans to serve the southern African and Australian markets.

## FAVOURABLE SITUATION

The favourable export situation is encouraging many manufacturers to look at markets elsewhere. Moxey Division, a handling extension of Babcock Moxey, is quoting on contracts South America.

The mining houses are using their purchasing muscle and have adopted a tough attitude towards the buying and maintaining of equipment.

As a result, spare parts have now become an important market to manufacturers.

"The mines are definitely repairing and re-using old machinery," says GEC commercial manager John Holmes. GEC manufactures pumps, water-cooling and refrigeration systems.



Mr GEOFF COOKE (right) instructs a group of pupils in the techniques of drafting during a three-day workshop in Bedfordview recently.

## Blacks taught drafting as a career

By SY MAKARINGE

ABOUT 60 pupils from 16 "disadvantaged" black schools on the Witwatersrand recently attended a three-day workshop in Bedfordview introducing them to the profession of drafting.

The main aims of

this project, conducted by the Programme for Technological and Engineering Careers (Protec), are to overcome the projected shortage of engineering and technically

qualified personnel in South Africa and to develop employer attitudes to accept candidates from all population groups.

Mr Peter Mosoardi, public relations officer of Engineering Management Services (EMS), said the workshop was held to create an awareness among the black pupils on drafting as a career and why it was necessary.

### Future

Mr Geoff Cooke, principal of the EMS Drafting Training Centre, said they endeavoured to give the pupils a feel for the discipline of drafting in order that they may give consideration to the field as a future career.

He added that in general, little or no comprehension and understanding of the drafting profession existed among black pupils.

"However, we attempt to overcome this lack of knowledge by familiarising them with various aspects of the drafting profession and advising them on its career potential," Mr Cooke said.

(179) Sowetan  
24/7/85



THE Government's recently introduced R100m job-creation programme, of which R25m has been earmarked for the training of unemployed persons through private industry, has been enthusiastically supported by the S A Sugar Association's Industrial Training Centre at Mount Edgecombe, which has contracted with the Department of Manpower to train 475 people in the next nine months.

179 NM 26/7/85  
The national project, aimed at training over 70 000 workers in one to three week courses in basic skills, has placed 70 percent of the 2 000 students who have completed courses in jobs.

Contractors offering courses are paid R22 a day for each person and trainees over 18 are paid R2,40 a day and those under R1,80.

Mr Tom Davidson, principal of Mount Edgecombe said the centre was offering basic courses in bricklaying, carpentry, plumbing, painting and welding, but the courses were restricted to people involved in the sugar industry who were being admitted through sugar companies.

Picture shows students from a carpentry class.

# Jobless: Call on companies

Chief Reporter

PRIVATE companies in all fields in the Western Cape are being called on to take part in a major government-sponsored scheme to provide training for unemployed people

Contracts have already been signed with firms for the training, at government expense, of about 10 000 jobless people in the area, and it is hoped to boost this figure appreciably in the next few months

Against the background of a down-turn in the economy and increasing unemployment, the government decided recently to allocate R100-million for job creation and training, and R20-million of this has been made immediately available for the training of the unemployed

The scheme, in which the costs to private companies of training workless people are paid by the Department of Manpower, started in mid-June and will continue until March next year, by which time it is hoped that up to 85 000 people will have been given training in a wide variety of skills

Mr W H de Swardt, the department's senior training adviser in the Western Cape, and Mr W H Sceales, former rector of the Cape Technikon and now regional training-project leader, emphasized yesterday that the scheme had no racial or other restrictions

Mr Sceales said "We aim to get as many firms as possible, in rural as well as urban areas, to avail themselves of this scheme, and we hope those companies with existing training facilities will expand them to provide training for as many unemployed people as they can possibly handle"

## 'Morale'

He added: "The main benefits of this scheme are that the country will have a substantial reservoir of trained or re-trained labour to draw from when the economy improves — and that the motivation provided by such a scheme will also act as a morale booster for those under training"

The requirements with which unemployed people must comply, to be considered for training in the State-sponsored scheme, are

- Their employability must be increased by the training

- They must be trainable and able to benefit from the training

- They must be motivated and willing to learn

Further details of the training scheme are obtainable from Mr De Swardt (Department of Manpower, PO Box 872, Cape Town 8000, or ☎ 45-7110) or from Mr Sceales, ☎ 46-7340 (office hours) or ☎ 23-1946 (after hours).



# Official accepts bribes - trainees

By MZIKAYISE EDOM

AN official at a Government-sponsored training centre allegedly accepts bribes from black trainees before they can pass tests.

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Three trainees claimed this week that they failed their courses at the Apex Group Training Centre near

Benoni last week, after they had refused to bribe the official with groceries and other gifts. The centre, provides courses such as carpentry, brick laying and welding, is sponsored by the Government.

SOWETAN  
Mr D Fourie, the centre's senior director, yesterday confirmed

that he has received complaints from certain trainees about the alleged bribes.

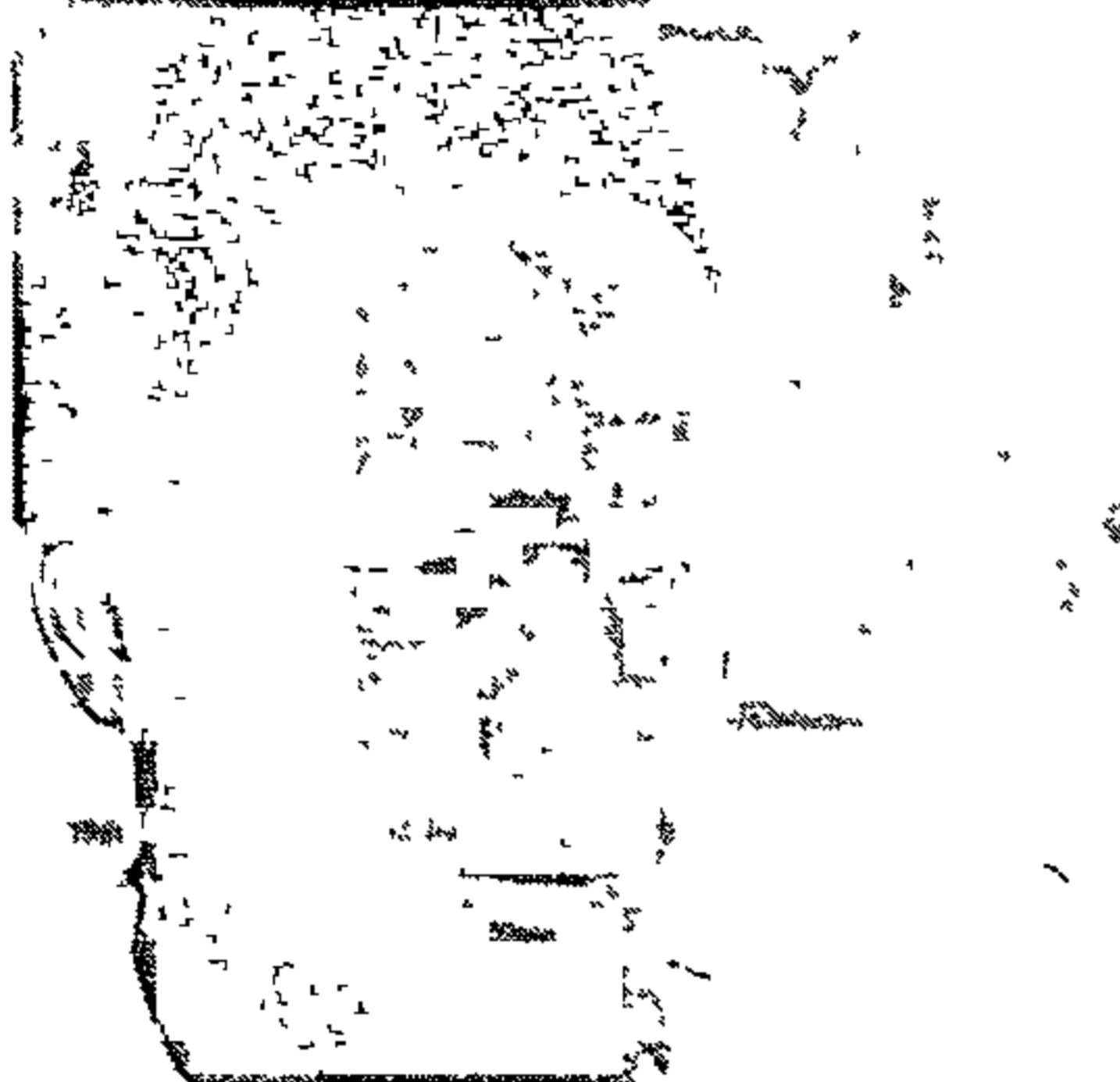
2/8/85  
Mr Fourie said the centre was investigating the allegations. He refused to elaborate.

One of the affected men, Mr Jacob "Berserk" Lekgwate, said he went to the centre two weeks ago to do a course

groceries and other gifts passed the examinations and all those who refused failed.

Mr Lekgwate said he has lodged an official complaint with the Department of Manpower which controls the centre.

Mr Fourie confirmed that Mr Lekgwate had complained to the department.



Mr LEKGWATE: Claims white officials demanded a bribe from him before he could pass a test

## Idling

He said "With other trainees we spent two weeks at the centre either idling or washing official cars.

"Not at any stage were we taught anything about driving and after two weeks we were surprised when we were told that we would be writing an examination and doing a practical test."

Mr Lekgwate said only those trainees who had bought the official

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# Training in civil engineering at 'all-time low'

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Property Editor

NM 3/8/85

TRAINING activities in civil engineering has been at almost an all-time low, according to Alan Dawson, chairman of the Natal Regional Training Committee of the industry training scheme (CEITS).

In his report presented to the annual meeting of the Natal branch of the Federation of Civil Engineering Contractors, (Safcec), in Durban yesterday, Mr Dawson said it was logical that as companies cut back on their labour force, it was the trained employees who were retained.

'Thus not only is there no demand for training new employees, but there is little demand for training in the existing labour force,' he said.

## Closure

'The effect of this has been so marked that many companies have virtually closed their "in-house" skills training facilities,' Mr Dawson added.

Safcec's national president, Mr Con Roux, denied accusations that the organisation is trying to create a cartel.

He told the meeting the accusations were 'absolutely unfounded'.

'We are a free association of members whose chosen representatives carry out the wishes of the majority,' he said.

'It must be remembered by our critics, however, that no organisation, especially one as large as ours, can function with-

out certain rules which have to be agreed on beforehand.

'In our case, the majority of these rules have been developed over a period of a large number of years, and few, if any, ad hoc policy decisions are made.

'Should anyone still believe ours is not a highly competitive industry, we invite him to try it.'

Mr Roux said Safcec had made representations to 'the highest authorities' for a larger slice of the R1 billion worth of construction work being done by the public sector.

## Policy

This, he said, would have a stabilising effect on the civil engineering industry.

'We do not wish to fight with our friends who do this work in Government and quasi-government sectors. All we want to tell them is that private-sector involvement is declared Government policy and this process can no longer be delayed or obstructed,' said Mr Roux.

He paid tribute to the Natal Provincial roads department for the considerable amount of work given to the private sector so far.



# UCT in bid to train blacks as managers

NMA 5/8/65 179

Mercury Correspondent

CAPE TOWN—A bold initiative to counter the chronic shortage of trained black managers in South Africa has been announced by the University of Cape Town

UCT's Graduate School of Business is to institute a Centre for African Management which will specialise in black management development and its allied problems

The first of its kind in South Africa, the centre has been launched with substantial support from both local companies and multi-nationals, as well as overseas universities

The chief aims of the centre will be

To help companies develop a corporate environment in which managers from diverse backgrounds can progress,

To introduce effective training programmes aimed initially at developing black managerial talent,

To enable individuals

to overcome the obstacles to their advancement into management and

To conduct research into problems associated with black training and advancement in business

Prof John Simpson, director of the Graduate School of Business, said the net effect would be a profound change in management style and philosophy

'Full integration at all levels will become a reality and not a dream or a myth I believe that management in South Africa will never be the same again'

Prof Simpson said that in contrast with the economies of the technologically advanced nations, Africa was grossly short of managers

'This serious state of affairs is the result of a long history of undermanagement which has been compounded by racial discrimination. Until recently, management was the domain of the white minority

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# Government is aiming to train 200 000 jobless

179 B. Day  
9/10/85

THE government hopes to provide training for more than 200 000 people as part of its massive project to combat the unemployment crisis

This follows its grant of R500m for creating short-term jobs and training unskilled workers. But the success of the programme also depends on the private sector, to whom the government is appealing for co-operation in creating job opportunities and for suggestions on projects

Minister of Manpower Pietie du Plessis says key meetings will be held with organised commerce, industry and employee bodies over the next few days



● DU PLESSIS

The minister is also appealing to private bodies to enlist public support to contribute to government's R25m allocation for food relief

Unemployed whites who are not eligible for Unemployment Insurance Fund (UIF) benefits and want to work on the new projects can contact the Department of Manpower

Unemployed coloureds can contact their Own Affairs Department and blacks the Department of Constitutional Planning and Development. Unemployed in rural areas can contact the nearest magistrate

The R500m will be financed mainly by the surcharge on imports. Responsibility for allocating the money to projects will rest with an inter-departmental committee chaired by the Director-General of Manpower, Dr Piet van der Merwe

The government also granted R100m earlier this year for the creation of special short-term employment programmes

Du Plessis said training had so far been provided for more than 12 000 un-

CLAIRE PICKARD-CAMBRIDGE

employed, while temporary jobs had been provided for at least another 60 000

The Durban City Council's Department of Parks, Recreation and Beaches was one organisation affected by this initial programme

The deputy director of the department, Martin Edwards, said they had received R415 000 from the Department of Manpower to provide temporary work at R4 a day

"We thought we would not get anybody to work for R4 a day, particularly because transport was not included and the casual rate in urban areas is R12 to R15 a day," he said.

"But we are now employing 550 people in three short-term projects following the city council's decision to subsidise transport for nearly 400 people, who are now employed on our main project at a golf course"

He said the transport subsidy amounted to R95 000. He did not think the project would have succeeded without it

Edwards said all three projects were labour intensive and required very few tools or materials. However, it was a short-term solution and he did not think the council could maintain the programme for more than five or six months

His department would find it difficult to maintain without additional staff, and high productivity was not being obtained from the temporary workers

Most people joining the scheme are black, though whites have also enlisted

Meanwhile, the UIF fund, which received nearly 400 000 applications this year and paid out R200m, is also receiving government assistance. About R150m has been allocated to assist the fund and projects initiated by the private sector



# Training centre for Cape needed

Tygerberg Bureau

THE Director-General of Manpower, Dr Piet van der Merwe, has appealed to the private sector in the Western Cape to create a control board and set up a group training centre

Fourteen group training centres operated in South Africa but none had been set up in the Western Cape because of the coloured preferential labour policy. A training centre was needed now that the policy had been abandoned, Dr van der Merwe said yesterday.

He was speaking at a training centre at the Cape Showground, Goodwood, which was set up at the start of the Government's scheme for training the unemployed.

## PRIVATE SECTOR

This could be the foundation of such a centre for the Western Cape but it had to be controlled by the private sector, he said.

The State offered employers a 75 percent subsidy on training costs at group training centres and a further 12,5 percent of the costs could be deducted from tax.

More than 3 000 workers had received training locally in the programme to train the unemployed which began in July and a substantial number had found work.

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# Hundreds queue to acquire new skills

Staff Reporter

THE number of people obtaining free training in various skills at the Western Cape Training Centre at Goodwood has more than trebled since it opened three months ago

A total of 1 100 people are currently being trained at the centre and every week the organizers turn away some 400 people they cannot accommodate

The courses, which last from one to three weeks, include training for basic timber skills, bricklaying, domestic work and store-keeping

The centre, which is the first of its kind in the Western Cape, has proved so successful

that a satellite centre will be opened soon in Paarl

Already more unemployed people have been given training at the Goodwood centre than anywhere else in the country, and there are plans for other centres along the West Coast and Caledon

The centre's director, Mr Johan Greyling, said it had also proved a "creator of jobs" Since July 1 the staff complement of job instructors had increased from two to 150

The centre, which falls under the the Bloemfontein Group Training Centre and is sponsored by the Department of Manpower, is a non-profit organization



(179) B. Daily 15/11/87

# Free training for 135 000 jobless



● DU PLESSIS

CLAIRE PICKARD-CAMBRIDGE

THE government's R50m scheme for training the unemployed has proved an outstanding success, Manpower Minister Pietie du Plessis said in Pretoria yesterday.

He said government's decision to call on the private sector to train the unemployed under contract had proved the correct one.

So far, 112 contracts for the training of 135 000 work-seekers had been entered into since July.

But he expressed concern at the reluctance of some employers to invest in the training of workers, despite the chance to recoup most of their training costs through tax concessions.

During 1984 employers lost about 350 000 man-days in working time as a result of work stoppages, with a considerable loss in wages and production.

Du Plessis said some of the stoppages could have been prevented through proper training in labour relations.

An alarming 3,2-million working days had been lost in 1984 as a result of injuries suffered on duty, with 194 690 cases of injury reported to the Workmen's Compensation Commissioner.

The R79m paid out to workmen in compensation for permanent disablement could have been attributed to inadequate safety training.

Only 11% of workers in agriculture,

forestry, fishing, manufacturing, construction and commerce and finance — whose training could have qualified for a tax concession in 1984 — enjoyed such training.

Du Plessis said government had introduced attractive financial incentives to alleviate the financial burden of employers in the training of workers.

Employers sending employees who earn less than R15 000 a year on approved training courses ultimately carried only 25% of the financial burden.

The balance was borne by the state, mainly as a result of tax concessions.

And employers in designated development areas only bore 12,5% of training costs if workers earned less than R15 000 a year.

Discontentment, low morale, absenteeism and high staff turnover could in many instances be directly related to lack of training, he said.

He said employers' organisations should, with trade unions, take the lead in organising training on an industry basis.

The National Training Board is investigating financial incentives other than tax concessions for training. Du Plessis said the investigation would be completed within the next few months.

179 C. P. v. s

# A place for the farm worker to learn

SEVEN business corporations are involved in a major training centre for semi-skilled and unskilled black farm workers in the Western Transvaal

The Boskop Training Centre for Farm Workers is near Potchefstroom, on the road to Carletonville. It has already trained more than 6 000 people

Boskop aims to upgrade the farm workers' standards on the premise that a properly trained work force will improve productivity, save on costs and lead to better relationships between farmers and employees

The latest scheme in the training of farmers involves training them in labour relations and personnel management

This has arisen because many farmers are ignorant of these subjects and because of the need for farmers to be able to develop skills among their farm workers

Boskop is devising the farmer programs in conjunction with Potchefstroom University

Another recent development is the introduction of mobile training units which train workers on farms, using the farmers' equipment

These mobile courses are frequently linked with health lectures given by the Health Department

Accommodation at the centre includes sleeping quarters (two-bed cubicles), where generally 40 trainees, but occasionally 115, are housed

In the evenings and at weekends films are shown and discussions held - dealing with personal motivation, the handling of money, family living standards and family planning

The companies involved are the Ford Motor Company, Shell, Esso, Total, Fedgas, Sentraboer and Triomf Fertilizer, which have given money, equipment or other forms of assistance. Vehicles and tractors are rented on a cheap rental scheme from Ford. The centre rents the vehicles for 11 months, after which they are replaced. Ford recently donated a lorry worth R53 000

Farmers are reported to be responding well to the scheme, having discovered the benefits of having trained workers in their employ.

The centre is also being used for the training of the unemployed and, as a result, it has become a small employment agency for farmers seeking labour

The following courses are available

## FARMING

Farmers can enrol workers for an intensive course in cattle care. This includes the branding, castration, dehorning and prostrating of cattle, care of hooves, dosing and dipping, diagnosing and treating common cattle diseases, looking after equipment and keeping records

A milking machine operator's course and a course on artificial insemination are also available

## MECHANICAL COURSES

Mechanical courses teach workers how to operate a harvester, maintain farm implements, maintain trucks and tractors, look after farm buildings and basic building techniques

## WELDING

Another popular course is welding. Trainees are instructed in gas welding, arc welding and brazing, basic workshop skills, the correct use and maintenance of tools and general repairs on the farm. Workshop organisation is also taught

## FENCING

After completing the fencing course, trainees must identify, handle and use different fencing materials. They are also taught how to prepare the terrain for boundary fencing and how to hang a gate

## DRIVING LICENCES

This course prepares workers for the following driving licences: tractor (code 5), light motor vehicle (code 8), heavy motor vehicle (code 10) and advanced driving techniques for heavy and light motor vehicles. Once the theoretical and practical courses are completed, trainees take their driving tests at the Potchefstroom Traffic Department.

Successful trainees receive certificates on completion of the courses, which can be used as references when seeking work.



# Need to train 1 300 welders

By CATHY SCHNELL

URGENT efforts were being made today to provide training for 1300 welders in Port Elizabeth and to secure Mossel Bay oil bonanza jobs for Eastern Cape workers

Mr Dieter Küsel, director of Emthonjeni Training Centre, was seeking to adapt his facilities to train the welders, expected, to be needed for the construction of the oil platform and rig for Mossel Bay

The oil platform is to be constructed in Port Elizabeth

He said he hoped to be able to train all these

people at the centre

This would provide employment for South Africans, rather than foreign welders, who might be considered for the jobs if local skills were insufficient

Mr Küsel said the centre was already equipped to train welders

All that would be required was for the centre to expand and adapt its methods to train welders on a large scale to handle the larger type of equipment found on an oil rig

Mr Küsel said he had heard that the construction of the platform and rig would start in 1987

"I would like to appeal to all those who want to be welders to come forward and enrol, and also to all companies who are involved with the rig and who want to train welders, to notify me soon

"If we want to train these people in time, we must start the training now"

Mr Küsel said the actual in-house training at the centre for the welders was about six months — depending on how the student progressed

The rest of the apprenticeship would have to be completed at the welder's place of work before he

would be allowed to work on the rig or platform — where only skilled and experienced welders would be employed

Therefore, at this point, the only people who would be trained in time to work on the platform would be qualified welders who enrolled for a specialised course at the centre

Already a couple of companies had approached him and asked him about training welders. He said the companies were involved with the rig

The centre is open to all races

BUS DAY 13/12/85

# Nafcoc, Barlows launch 'job factory'

THE Barlow Rand Foundation and the National African Federated Chamber of Commerce (Nafcoc) yesterday announced the formation of a joint venture company to create jobs.

The new company, Job Creation SA, will be chaired by Nafcoc president Dr Sam Motsuenyane, with Barlow Rand chairman Mike Rosholt as vice-chairman.

Barlows will give Job Creation its first contract for the creation of 500 jobs at an estimated cost to the group of R2,5m.

"For several years Nafcoc has been extremely concerned about SA's rising unemployment," Motsuenyane said.

"We have been seeking a practical, private-sector approach to create new, lasting employment."

Rosholt said "The concept of a profit-oriented job creation company operating within the private sector is most exciting."

"Governments overseas, based on a welfare approach, have often proved disappointing."

179  
"Job Creation is paid by results and is taking the same sort of commercial risk as the would-be entrepreneur."

Though the company will be subject to all the disciplines of the profit motive, Nafcoc's share of profits will be used to improve service to its 15 000 members.

Barlow Rand Foundation's share will be ploughed back into community affairs.

Ian Hetherington has been appointed MD of Job Creation. — Sapa.



# 'French Connection' training scheme

(179) (651)  
C. P. van  
15/12/85

THE PARIS Chamber of Commerce has launched a R1,3-million scheme to train black business managers in South Africa.

The scheme is being run in conjunction with the Urban Foundation, the National African Chamber of Commerce and the Black Management Forum.

It is designed to be a major thrust into the area of social responsibility by French business and is similar to other training schemes instituted by the Chamber in Third World countries such as Senegal and the Ivory Coast

Called the Joint Management Development Program, the project will be spread over three years and give candidates the opportunity of learn-

### Prospects Reporter

ing business management skills.

A number of SA companies with French connections have been contracted to take part by sending their staff to for courses

The sponsoring companies are the French Bank of SA and Roussel Laboratories in conjunction with the Paris Chamber of Commerce and Industries

Companies involved in

the scheme in SA are African Explosives and Chemical Industries, Barclays National Bank Barclays Industrial Bank Comiat (SA Branch), Firestone, Liquid Air, Mobil, Nedbank, Powerline, SA Perm, 3M, Stan- nic, Total, United Building Society and SA Nylon Spinners

The JMDP, spread over three years, comprises

★ Ten weeks a year of off-the-job training and development by the sponsoring and participating companies, business schools and consultancies

★ An in-company support program to help the participating companies with the management of on-the-job development

and advancement of those on the program

There have been non-racial approaches to management development before in SA, but certain factors make the scheme unique

These are

★ The strength of a joint effort by the founding bodies and some SA companies

★ The international expertise of the Paris Chamber and its experience in Senegal and the Ivory Coast, where it has developed several highly successful co-operation projects

★ Full black participation through Nafcoc, BMF and other black specialists so that the JMDP will not be an-

other program "by whites for black people"

★ The full backing of the Urban Foundation  
★ Freedom to draw on the best available resources in the field of management development

★ A high level of commitment from participating companies

★ A focus not only on training and development but also on measurable specific advancement targets

★ High potential participants with an average of 10 years work experience

For further information contact

★ Clive Acton ☎ 728-1296/7 or 728-6889.

★ Stewart Carlyle ☎ 833-1620

(na) (2/2)

## Training for 13 000 W R *Jan 19/12/85* unemployed

The West Rand Development Board is to spend more than R1 million in the next three months on occupational training for the unemployed in its area

The board's chairman, Mr J C Knoetze, announced the scheme at a Press conference in Johannesburg yesterday

Mr Knoetze said the training programme would be financed by the Government's unemployment relief fund from which an amount of R1 690 000 would be used to train more than 13 000 jobless

He explained that trainees over the age of 18 would receive R2,40 a day allowance and R1,80 a day if younger

A refund of transport costs to a maximum of R1 a day — up to R1,75 in exceptional circumstances — would be paid to trainees

Training offered will include courses for housekeepers, motor mechanic assistants, office and shop workers and small business entrepreneurs

The courses last between five and 15 days



# Rising costs hit bar coding

THE introduction of bar coding on goods sold across retail counters in SA is beginning to gain momentum — but full-scale implementation of the system is being bogged down by rapidly escalating costs

First moves towards adopting the international coding system in this country were made two years ago when SA acquired its own EAN code, and the SA Numbering Association (Sana) was formed to control its implementation

Since then about 900 local manufacturers and suppliers have registered with Sana and are marking all their products with bar-coded labels

This is good progress in a short time and compares favourably with the development of the system in countries like the UK and West Germany, remarks Sana's Bob Percy.

In the UK, for example, where bar coding has been around for a lot longer, about 4 000 companies are mem-

By CHRIS CAIRNCROSS

bers of Sana's equivalent body there

"Our performance so far suggests we are probably on a par with Australia or New Zealand," Percy adds

Coding products is one matter, getting retailers to complete the cycle by installing scanning equipment at checkouts is a different story

Percy reckons that only about 25 stores throughout SA have installed scanning sites thus far. These include the big chains like OK Bazaars, Pick 'n Pay and Checkers. CNA and Boardmans are also on the list

The slow start from the retail sector is understandable as there is a high cost in equipping outlets with computer-linked electronic scanners

This, more than anything else, has caused these retailers to cut back substantially on any plans they may have originally had of using bar-code scanning in a big way

Pick 'n Pay is, perhaps, one of the more enthusiastic proponents of the system, yet it has introduced scanning equipment into only one of its outlets thus far — its newest hypermarket in Pretoria

The capital costs for this single exercise, according to Pick 'n Pay executives, is well over R25m

OK Bazaars is another of the big chains which has pruned back its initial plans for going into scanning in a big way, and only two stores — both in the Transvaal — are being equipped with scanners

OK's GM management services Taffy Hewson says it costs more than R600 000 just to equip the group's comparatively small Randburg store with hand-held and flat-bed electronic scanners, and he confesses there are still considerable mixed feelings about the bar-coding system

# High-tech — a R4bn buzzword for the frontier of technology

BUS. DAY 31/12/85  
179A

HIGH-TECH is a buzzword covering electronic components, equipment and systems, a market worth more than R4bn a year.

But what is high technology? The experts find the prospect of a broad definition provocative.

Siemens joint MD Dietrich Botsch puts it in an electronic nutshell: "High-tech is any application of a sophisticated combination of electronics, electromechanics and integrated circuits, be it necessary for production, office application or merely for entertainment."

But then he adds that single components, such as microprocessors, should also be called high technology.

Group executive technology at Altech, David Jacobson, says even "technology" is a buzzword.

## Applied science

"What technology means to me is applied science, and science in turn is the process of understanding natural phenomena, such as lightning, electricity, materials and their properties.

"Making this understanding work for you is technology.

"Understanding the properties of silicon, for instance, leads to the development of the transistor, and from there to complicated electronic devices which do things of which we never dreamt.

"Technology is really our servant, and we use our constantly evolving store of science to develop further technology."

High-tech, says Jacobson, is the cutting edge of technology, the most advanced part, with the most advanced manufacturing processes

Like Siemens' Botsch, Jacobson sees a microprocessor as a prime example.

"It is the heart of computing equipment; it is like a computer on a single chip. Today you can buy a chip with a word length of 32 bits, a high precision capability of holding numbers.

"It works at very high rates — over millions of instructions per second — with input/output devices which enable one to read out results from the chip to a printer or tape recorder or disk."

## Innovations

IBM marketing and services director Tony Dry says the concept of high-tech is based on a set of radical innovations which have drastically reduced the cost of storing, processing and disseminating information.

It affects the entire economy and industry, from mining to agriculture, and every branch of manufacturing and service.

"High-tech is changing the types of product that can be offered, and it is also modifying the processes by which they are made," he says.

Says Philips general manager, scientific and industrial, Wilfried Muller: "We are still working with basic physics, but we are taking smaller, more intricate steps than 100 years ago.

"The times of great discovery, as with Newton and gravity and Maxwell and induction laws, are no more."

"What counts today, says Muller, is

● This is the first in a series of three articles on high technology by Fred Stiglingh. Part 2 will appear on Friday.

what one does with physics, which amounts to how much computing power one applies.

Analysis of certain materials and substances involve the same technology as years ago, he says, but through automation and computing power, reliable results are available in seconds.

Engineers using waveform analysis to find out, for example, why a turbine blade breaks at a certain stage, have instant access to results through powerful microprocessors linked to the turbine.

"The age of the slide-rule and the scientific pocket calculator is gone," says Muller.

Microprocessors can do today what mainframe computers did yesterday.

"Integration will improve, leading to smaller, more powerful and reliable instruments that consume less energy," he says.

There is full agreement that SA should be involved in the cutting edge of technology.

Productivity and competitiveness are at stake, say the experts.

## Information

According to IBM's Dry: "Information technology increases productivity not only of people but of the entire investment, with capital costs, material costs and energy costs all taken into account."

Manufacturing, he says, involves time and information gaps between design, procurement, production, administration and dispatch. Information technology makes it possible to reduce these gaps.

As a result, products and manufacturing processes can quickly be modified. Where until now local manufacturers have tended to rely on economies of scale, they will increasingly have to apply mass production techniques to smaller batches and still show a profit.

In addition, they should adapt to operating with reduced stock levels and less work-in-progress.

"They can achieve this by using technology to link component suppliers with those who are assembling finished products," says Dry.

Altech's Jacobson. "You're either in it, or you're out.

"To be really in it is to do your own development. It enables you to get a feel and ability to predict where things are going."

SA is not really at the high-tech edge, says Jacobson.

"In terms of our purchase of technology, we are. We can pick off the shelf a high-tech device made somewhere else with the most advanced processes available."

But if SA does not undertake its own development, he says, it will look to a future without meaningful industry.

"We will be cut off from the rest of the world."



MAN POWER - TECHNOLOGICAL CHANGE

1986 - 1987

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# Adcock warns on automation

SIPA 11/18/86 1791A  
Sven Linsche-

Toyota MD Mr Colin Adcock has warned that automation in South Africa should not take away jobs from people if they could achieve efficiency and productivity

In his opening address to a symposium on robotics, he said that the biggest single challenge to the local industry was to find economic solutions to the unemployment problem

"We need to create about 800 job opportunities each day, and if too much pressure is put on companies to automate it might exacerbate the problem," he said

Mr Adcock said that South Africa was in many respects a Third World country and had therefore to focus on creating job opportunities "This involves the deregulation of the informal sector to a large extent, which in the long run could create numerous jobs. Once this is achieved automation can go ahead at the rate required," he said

He referred to the Japanese way of auto-

mation, a company only automates if the job is too dirty, too dangerous or if human beings are incapable of producing similar quality or quantity

In SA there is a potential fourth reason, namely if the labour force fails to co-operate. But Mr Adcock said this should only be a last resort in labour relations "as we cannot expect the labour force to work themselves out of their jobs, in our drive for efficiency through automation or other methods".

Mr Adcock said that if workers had become redundant as a result of productivity measures in his company, efforts were made to relocate them in newly created sectors "Productivity cannot only be achieved through automation, but also by using labour effectively in all fields of production," he said

"We have a social responsibility in this country and the least we can do is to achieve a harmonious balance between man and machine," Mr Adcock said



# How Man can survive in the world of high-tech

By Michael Chester

Sombre dole queues and grim forecasts of perhaps yet worse unemployment problems to come have stirred renewed controversy on the issue of Man versus Machine.

In parody, the battle lines are drawn between sociologists, armed with picks and shovels and in earnest argument that job creation alone should rule economic policies, and technologists, with counter-arguments that robots alone can avert disaster.

The debate has been sharpened by estimates by Professor Jan Sadie, of the Bureau for Economic Research at Stellenbosch, that if the South African economy grows no faster than an annual average of three percent over the next 15 years — which looks likely unless a magical new formula can be found — the labour surplus by the year 2000 will swell by 3,8 million workers.

In short, at that economic tempo, no more than 3 260 000 jobs will be created to cope with an avalanche of more than seven million new work-seekers.

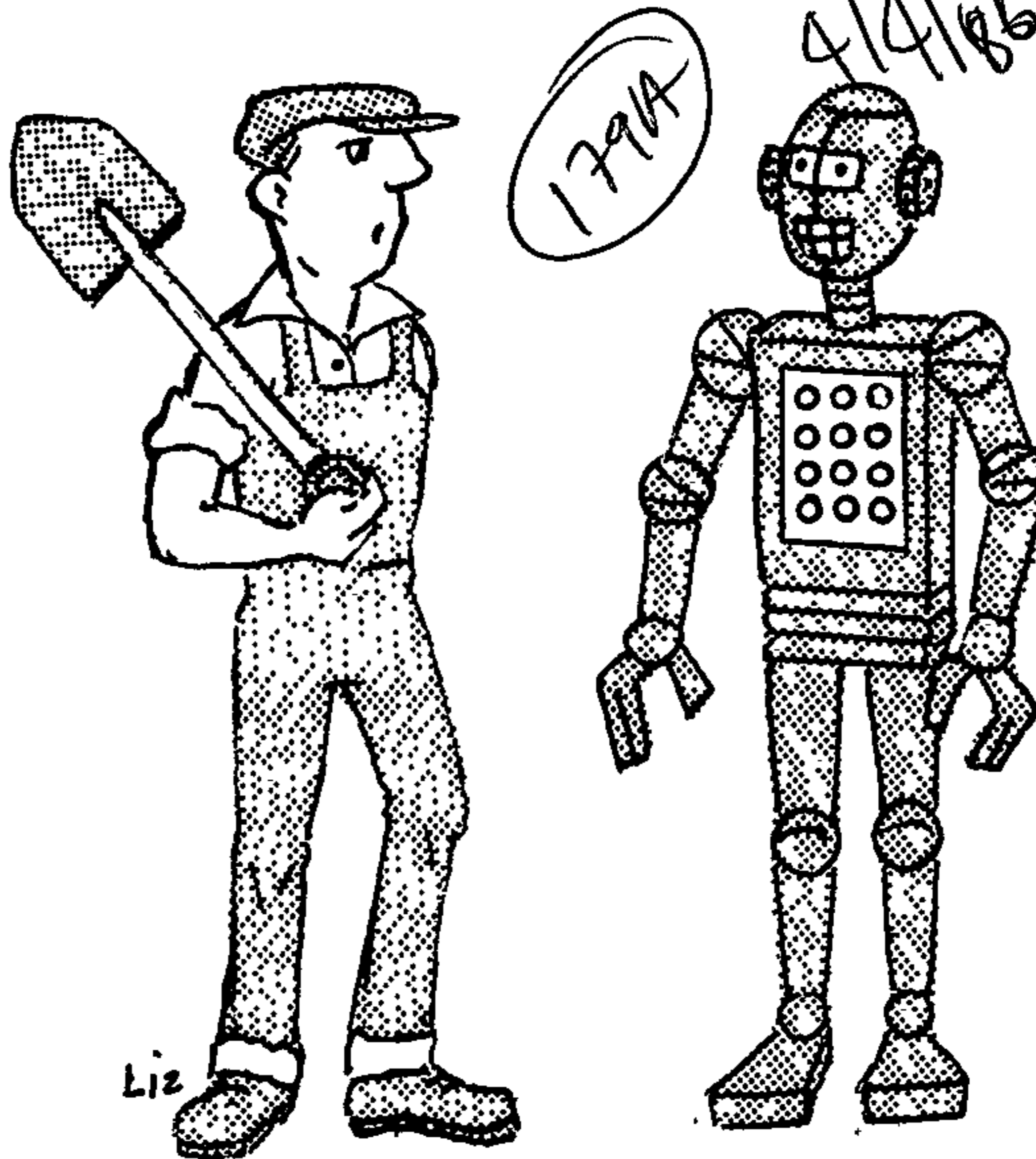
## Strategies

The dilemma stirred the Man versus Machine debate afresh at a recent national convention in Johannesburg, sponsored by P-E Corporate Services to review trends inside the manufacturing sector and discuss how best to tackle new strategies.

What caused the protagonists to pause and prick their ears was what each side considered an astonishing revelation by Dr Walter Hasselkus, managing director of BMW South Africa: there may be an alternative to confrontation between Man and Robot — even a peace pact between the two gladiators.

The first lesson to be digested, he argued, was that the industrial leaders overseas — in North America, in Western Europe, in the Far East — had proved that the old notion that mechanisation was an automatic cause of unemployment was a myth.

Next, it was imperative that



South Africa, with its own complex mix of economic and socio-political problems, found its own formula to strike a balance between First World and Third World industrial stances.

The formula involved the adoption of technology at a level that holds unemployment in check while staying abreast with global competition, and easing away from current dependence on volatile primary exports.

"In other words, a technological dualism — an economic structure with an appropriate slot for high-technology production, relying heavily on mechanisation, and low-technology ventures that fit the socio-economic system and need for employment."

South Africa was equipped for the task

- A vast labour force willing to be trained
- The universities and technikons needed to produce highly-qualified engineers and technicians
- A middle and top-business management cadre that compared favourably in standard with anywhere on earth
- An array of subsidiaries of multinationals that had access to advanced technological know-how developed by their parent companies

In a crucial first move, political and business leaders had to sit down and work out a masterplan for the entire subcontinent with strategies devoid of petty party politics.

Workers would be wrong if they resisted automation. They must learn to accept that mechanisation was vital if South Africa hoped to

survive against intense international competition on domestic as well as overseas markets, in turn vital to economic growth on which jobs depended anyway.

With the correct strategies, it would soon become apparent there was room for both Man and Machine — in fact a partnership between them.

Dr Hasselkus demonstrated how BMW had put the theory into practice in its South African operations. By making full use of comparative advantages in a wide sphere, the local company had even managed to secure orders to export components to the massive BMW hi-tech motor works in West Germany.

## Exported

BMW had exported not only high-technology components but had also used its satellite plant in Ga-Rankuwa to put to use traditional local sewing talents to produce hand-stitched leather trim for its luxury cars.

There were scores of similar possibilities open to South African companies to blend high technology and local labour skills in production strategies, delving into the most sophisticated industrial sectors.

"We must not fall into the trap of assuming that a choice must be made between mechanisation and labour-intensive projects," said Dr Hasselkus.

"Why are South Africa's living standards less than one sixth of the levels in Sweden, West Germany, Canada and the United States? Why, instead of catching up, are we falling behind?"

"We have enormous mineral wealth. We have abundant labour ready to be trained. We have access to hi-tech know-how. The task now is to find the formula to set them all to work in co-operation."

"With sound planning, a partnership between Man and Machine, South Africa can be groomed to take an enormous leap forward," he said.



# Getting integrated

After years of talk, computer-integrated manufacturing (CIM) seems to have come of age

While the West has struggled to compete in recent years with Eastern productivity, the integration of manufacturing functions into a common data base has been hailed as the key to survival

Manufacturers, particularly in the US, have proceeded apace with the automation and computerisation of their factories. However, communication between different systems has remained a major bugbear, resulting in so-called "islands of automation"

This communication problem has been tackled by both computer manufacturers and their industrial clients. General Motors (GM), for example, is pinning its hopes on what it calls Manufacturing Automation Protocol (MAP), a far-sighted programme to develop the ultimate "factory of the future."

To this end, GM has spent billions of dollars buying companies with the necessary expertise to develop the systems it needs. CIM is becoming big business.

Last year IBM forecast that the world market for industrial automation would be \$65 billion-\$75 billion in 1989. It also predicted the CIM subset of that market would pass \$26 billion in 1989.

Despite the hype, no company has claimed to have produced a viable and complete CIM system. But, for the first time in SA, Siemens has demonstrated a computerised system claimed to be the first in the world to integrate all the engineering and manufacturing functions in a factory.



Siemens' Bouwer ... CIM on show

Called SICIM, it is a modular CIM design which is claimed to allow the entire production process to be computerised from order, through design, scheduling and manufacture, to costing and billing.

The basic premise of CIM is that, by linking and automating all the functions of factory and company headquarters, a manufacturer can turn out essentially perfect, one-of-a-kind products at the lowest possible

cost

SICIM, explains Rudy Bouwer, Siemens GM for data and information systems, aims to cut across the barriers of "islands of automation". He stresses that all South African manufacturers need CIM if they want to remain competitive on world markets. Says Bouwer "The factory of the future is the only factory with a future."

He reckons Siemens leads the world in CIM technology "We are decades ahead. No other organisation can address every one of the cornerstones of manufacturing."

He bases his claim on the fact that, while most major computer companies are developing CIM systems, they do not have the manufacturing background of Siemens.

Bouwer believes there are about 800 manufacturing companies in SA — each employing at least 800 employees — that could benefit from CIM. A small system could be implemented at a cost of about R400 000.

However, the proof of the pudding is in the eating and for the moment at least, the system has yet to be seen in commercial operation in SA. The first installation could be in one of Siemens' local factories, says Bouwer.

Until it can be shown to work on the shop floor, the growth of CIM in SA is likely to be slow. But Bouwer is optimistic Siemens will receive at least two major contracts to install full CIM systems by the end of this year.

"It is a modular system that is installed in phases and will take between three and five years to fully implement," he points out. "We are already doing four feasibility studies, and interest is high."

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FIN MAIL



## COMPUTERS

BUD DAY

12/6/86

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THE United Building Society's Data Centre claims to be realising a saving of 50 operator man-hours a day since the introduction of specialised software on its IBM computer installation, which includes the latest IBM 3090/200 "Sierra" hardware.

The package responsible for this saving is an automated tape library management system called CA-DYNAM/AM/TLMS. The UBS centre is on-line to more than 600 networked computer locations. The package captures tape activity and, through its master database, monitors tape usage, performance, the error frequency on each tape and its location within the system.

"It also generates management reports, which assist us to schedule the use of the 6 000 tapes in our library."

said production control administrator Glen Mullett. "It automatically cycles back-up tapes and provides an on-line enquiry facility."

The team has customised the package, allowing it to interface with mini-programs of their own development to enhance data protection and security, and facilitate data recovery in the event of a disaster.

"No other CA-DYNAM/TLMS user in SA has gone to these lengths to optimise the package," said Mike Taylor, marketing director of software supplier Computing Benefits. Another Computing Benefits' pack-

# UBS saves man-hours

age in use at the UBS is CA-Scheduler, a production scheduling and management system commissioned in late 1985 to replace the UBS's manual scheduling system.

According to production control manager Francois Lubbe, the package is used to control about 102 jobs, which are listed for execution each week-day (including Saturdays), and 85 jobs scheduled for Sundays and public holidays.

"At month-end we incorporate approximately 130 additional jobs into the daily sequence, giving the package a peak of around 235 jobs to

handle in a 24-hour period," he said.

"The most useful feature of the package, from our point of view, is that no job is forgotten. If the schedule is correctly drawn, and the run-criteria are adequately identified, then each job will run at its appointed time. And because of its forecasting facility, we can plan a schedule well in advance.

"There are a number of spin-off benefits, mainly centred on the production of accurate statistics, focusing on a number of areas which, from the operations aspect, allows more productive use of computing time and memory storage space."

□ THE DATA communications systems market in SA is currently worth R85m a year and it is growing at between 16 and 22%, according to Werner Sievers, chairman of the Dimension Data group of companies. This figure excludes computer input/output peripherals, mainframe front-end processors and host-bound communication software. Dimension Data expects to achieve an 18% share of this market by the end of 1986 with a

further 4% penetration by the end of 1987. Confidence of the continued growth of the SA industry, Sievers nevertheless sounded a cautionary note: "Alternative channels of supply for high technology data communications equipment will have to be found, and local repair and enhancement of all imported data communications systems will have to be upgraded. This is essential to protect not only the currently installed base, but also the future."

1794  
**Technology council to be appointed**

Own Correspondent

JOHANNESBURG — The Cabinet is to appoint a Technology Advisory Council to co-ordinate the development of technology, Economic Affairs and Technology Minister Danie Steyn said last night

Addressing the (SA) Italian Chamber of Trade in Johannesburg, Steyn said the council had arisen from a need to promote technological development in a more purposeful manner on a wider, co-ordinated basis

Steyn said that, with the minister's consent, the council will be able to appoint working groups to undertake specific investigations. And expertise from the private sector, universities and technikons will be co-opted in specific identified fields

He said Mintek president A M Edwards had been appointed to head the council as head, technology planning in the Ministry of Economic Affairs and Technology

Other council members in-

clude CSIR president Chris Garbers, SABS director-general Pierre Verster, Atomic Energy Corporation CE Wynand de Villiers, Escom CE Johan Maree, National Productivity Institute executive director Jan Visser, Trade and Industry director-general Sarel du Plessis and Mineral and Energy Affairs director-general Louw Alberts

Defence Minister Magnus Malan is still to nominate an Armscor representative



# Technology to the fore

TECHNOLOGY is playing an important role in the revitalisation of banking services

By 1995, a majority of all personal customers are expected to be using automatic teller machines (ATMs) regularly, says a survey by Arthur Andersen & Co.

More than half of all personal customers are expected to use electronic funds transfer at the point of sale by 1995 and, by the same year, a quarter of all personal customers are expected to be subscribers to a home-banking system

Technology will remain the most effective vehicle for reducing processing costs and increasing productivity, says the report. Technology will also be used to provide competitive advantage in the market. Failure to keep up with developments will lead to competitive disadvantages.

The survey predicts greater expenditure will be devoted to all aspects of technology implementation. Among them, the investment in high-calibre systems personnel will increase rapidly

PIM 6/2/87

## SIGNS OF THE TIMES

(179A)

Rampant technology is threatening to eclipse yet another traditional trade. Despite the fact that signage companies are on the up-and-up, signwriters are under threat from the ubiquitous computer.

The local industry has been reshaped by graphic computers, which can produce signs in any shape, colour or design cut out of adhesive vinyl. Technically, there are no limitations on width, depth, colour, typeface or style of logo.

Already major signage companies in the PWV area have installed the machines, with a resultant loss of work for traditional signwriters. The number employed by Natanya Signs, for example, has been almost halved.

Natanya MD David van der Knaap says certain areas, such as gold-leaf work and murals, will probably remain the preserve of the signwriter, and some will be retrained to provide creative input for the graphic computers.

Natanya's computer can specify more

than 70 different typefaces with infinite variations of size, slope, letter spacing and layout, accurate to 0,1 mm. Free-form graphics and company logos can be digitised and stored by the computer for recall if additional orders are placed.

Signs are then cut from self-adhesive and waterproof vinyl which is guaranteed against colour-fading for up to seven years. The material does not chip or fade and can be silkscreened with special colours.

Most custom comes from retail outlets, airlines and companies requiring large orders of identical signs and logos. Owners of large vehicle fleets, too, are likely to welcome the development, because signs can be made in advance and applied to doors or panels with no downtime.

There are also cost advantages. Vinyl signs for two doors of a truck, for example, would cost about R100 as opposed to R140 for conventional signwriting, plus the cost of vehicle downtime.



# High-tech leads to high stress, say experts

Star The Star Bureau 179A  
LONDON — A grim picture of stress and strain on secretarial staff because of new computer technology in the office is being collated by two researchers.

They have found that secretaries have suffered a string of serious side-effects as the result of streamlining techniques

Mr Howard Khan, a lecturer in computing, and Professor Cary Cooper, internationally known for his research into stress at work, are completing a study into "computing stress"

- They have found secretaries can face:
- Skin problems and an increase in smoking.
  - More demands on eye, back and arm muscles.
  - More slipshod work from employers.
  - A faster working pace because of hidden fears that equipment might break down.
  - Higher levels of boredom, fatigue and monotony and an increase in the time taken to wind down after work.

Professor Cooper said, "Some secretaries feel as though they are just an extension of the machine"

Technology: set to take the high road?

# Govt 'must make direct grants and concessions'

HELOISE HENNING

GOVERNMENT must make direct grants to industry and introduce tax concessions for technological development (TD) if SA was to have an economically successful and politically stable future, Altron Group technological director David Jacobson said.

Using Clem Sunter's paradigm in the analysis of SA's future, Jacobson told the UCT Graduate School of Business Association in Johannesburg last night the "high road" for SA's technology lay in boosting and restructuring its export mix. That was only possible if industrial research and development, or TD, took place.

He said the creation last year of a Department of Economic Affairs and Technology gave technology its rightful place. But the gap between the Council for Scientific and Industrial Research (CSIR) and industry could only be bridged if CSIR allocated "a fraction" of its parliamentary grant to industry.

The grant could be given with the

"string attached" that industry only spend the funds on market-driven TD.

Jacobson said many believed the development under licence in industry of components and equipment had retarded local technology development.

In fact, SA's ability to produce products and systems had increased vastly and had sharpened production and management skills.

Events which had isolated SA had caused the growth of a secondary industry. The Second World War had provided the impetus for the creation of a local electrical engineering industry that then exported to Britain.

The electronic growth in SA took off with the Post Office's impetus to stimulate local manufacturing with the transformation of electronic design.

While government had been stimulating growth, private industry had not been dormant. Jacobson referred to Altron's "vigorous commitment", since September 1985, to the expansion of TD



IN LINE with worldwide trends, computerised checkout scanning, which enables retailers to tighten inventory control and cut theft by about half, is taking off in SA.

The first bank of numbers that barcode goods — through the unique identification of products by way of 13 digits of varying widths — were issued in SA four years ago.

Today 80% of foodstuffs are coded, while retailers have introduced the system in about 70 pilot stores, a figure that is set to double by the end of next year. The CNA alone plans to install scanning in 100 outlets by 1988.

**Greater impetus**

In comparison with an initial period in 15 European countries — where almost 15 000 stores now use barcodes — twice as many SA stores have adopted the system, says SA Numbering Association executive director Bob Pearcey. He says scanning would have had still greater impetus if the rand had not dropped sharply two years ago and made importation of the technology almost prohibitive.

In addition, scanning-installation costs per store are greater than in the

# Now is the time to check out barcoding

US, as more checkout points are required in SA to cater for peak cycles — because of SA's restricted shopping hours, more than 50% of weekly turnover takes place on Friday afternoons and Saturday mornings.

However, Pearcey says the capital investment in scanning can be paid back in 18 to 20 months through the more effective and more efficient operations it affords. In the US, where scanning is 11 years old, it has been found to have increased profits by 1%.

Pick 'n Pay has pilot scanning in two of its hypermarkets and hopes to install scanning systems in all its stores within the next three years.

Pick 'n Pay systems director Ronnie Herzfeld says better shrinkage performance has already been noted in the

**KAY TURVEY**

stores making use of scanning. Pearcey says scanning not only prevents under-ringing by cashiers, but also highlights inconsistencies in a cashier's performance. The information carried by scanners also allows one to identify areas where shrinkage is taking place.

**Save on interest**

Taffy Hewson, management services director at the OK, which has installed scanning at three stores, says the area were "fortunes" can be saved is on interest payable on stock held. He says item sales can be recorded

efficiently — "the first writing is the last writing" — and precise selling rates can be established, thus allowing for quick stock-turns and eliminating the need to hold buffer stock.

However, Hewson says setbacks have been experienced through lack of agreement on ways of barcoding all goods. At present, barcoding cannot give the information required for different pricing structures on different-sized clothing, and it is possible to remove barcoded labels from fabrics.

Symbols cannot be printed directly onto fabric as the weave disrupts the logic in the scanner.

Retailers also see scanning as benefiting the consumer through faster checkouts and more descriptive, easier-to-check sales receipts.

(179A) B/Duy  
25/8/87  
Farmers mechanising 'just for the sake of it'

# High unemployment results in govt plea to agriculture

A PLEA for agriculture to rethink its policies and attitudes towards mechanisation in the light of the high and growing levels of unemployment in SA, was made yesterday by Economic Affairs and Technology Deputy Minister George Bartlett

Opening an agricultural engineering congress in Mmabatho, Bartlett acknowledged this proposal flew in the face of current thought and trends within the sector

He said he believed that the level of agricultural mechanisation in a developing country like SA should be inverse-

CHRIS CAIRNCROSS

ly proportional to that country's level of industrialisation

"I suggest that perhaps many commercial farmers are just mechanising for mechanisation's sake"

Bartlett indicated other sectors within agriculture could do well to follow the example set by the country's sugar farmers, who chose not to go the mechanisation route in the cutting of sugar cane

Today, 24 years on, there is not a single mechanical cane cutter operating in SA on a commercial basis, and there is also no shortage of labour in the industry

About 20 000 cane cutters have work in the industry, productivity has reached a high level and the capital cost of replacing workers with machines would probably amount to R100m, he said

He acknowledged the farming community remained under considerable pressure, and predicted that conditions were likely to get worse before they got better — for some at least

Bartlett suggested that the survivors would be those who fully understood the true meaning of productivity, the agricultural price formulae mechanisms, and the effect of current tax laws and allowances on these formulae

Bartlett focused on the major economic dilemma facing farmers, namely that costs were outpacing revenue

He noted that in 1973 the average cost of tractors in rands per kilowatt was R109. By 1981 this had inflated to R335, an annual compound increase of 15%

By 1984, this had further increased by 19,3% a year to R568 per kilowatt

Bartlett said he was unable to identify all the reasons for the hefty increases in tractor and implement prices, but said that the engines provided by IDC-controlled ADE, together with foreign exchange rates, had played an important role

Bartlett maintained tax legislation had also encouraged inefficiency in the use of scarce capital by providing incentives to farmers to buy capital goods



# MANPOWER — TECHNOLOGICAL CHANGES

1988 — 1990

# Technology will mean 'de-skilling'

179A B/day 14/10/88  
BRONWYN ADAMS 14/10/88

THE technologically developed phase into which SA had been launched would cause the "de-skilling" of work, which would result in an economy based on assembly lines and microchips, thus necessitating a new dimension in education, Acting Director of Education Dirk Meiring said this week

Speaking at the Institute for Personnel Management seminar at Sun City, Meiring said a closer liaison between formal education and non-formal work situation was needed

He said at the turn of the century 300 000 people would enter the job market and 40-million individuals, of whom 60% would probably be dependent on secondary industries for their living, would live in the metropolitan areas. However, the formal sector would only be able to absorb 30% of all work-seekers

SA, therefore, required an investment in relevant education imparting basic personal and vocational skills to meet the ability of the pupil and the needs of the working world — "career education", Meiring said

Skills training should begin at school rather than at work and be directly related to job achievement, he said. There should be a flow of information between the formal education and the non-formal work sector.



# Machines 'not the answer'

WHILE employers hurt by stayaways may move towards more capital-intensive production, this does not necessarily make economic sense, say economists and spokesmen for organised business.

An FCI spokesman says: "One cannot say there will be a move towards mechanisation in general. It is a highly specific question to each sector. But uncertainty on the labour front will certainly be taken into account when a manufacturing strategy is planned."

Sectors such as mining and chemicals are already very capital intensive, while for others — such as clothing and cars — mechanisation to replace the workforce is not a viable prospect

A mining analyst says generally

Business Day Reporters

speaking where mechanisation is possible it has been done. He cites examples of open-pit coalmining, which is heavily capital intensive.

National Institute for Productivity (NPI) statistics show capital input used to generate products and services increased 25% from 1980 to 1987 while labour input declined about 2% in the same period

NPI economist Roelf du Plooy says the capital labour ratio has been on a rising trend for a number of reasons and is likely to continue. The trend towards

To Page 2

# Machines 'not the answer to stayaways'

increasing capital input is typical of a developing country such as SA.

He says developments on the labour front have caused employers to think increasingly in terms of mechanisation. However, the figures show the trend towards using more capital and less labour have not resulted in increased overall productivity

Cape Clothing Manufacturers' Association secretary Colin McCarthy says the

industry is still labour intensive and mechanisation is not a viable prospect

Volkswagen SA spokesman Ronnie Kruger says experience in West Germany has proven mechanisation becomes economical only when daily production levels are at 2 000 cars. VW, one of the largest local producers, makes only 300 a day.

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THE need for more education and training in the technical field has been highlighted by two experts.

The first is authoress Monica Bot in a publication entitled Training on Separate Tracks. She says there will not be enough skilled workers to underpin economic growth unless there are dramatic improvements in black education, particularly technical

On present trends, with a 2% average annual growth rate, by the year 2000 there will be a shortage of 2000 skilled workers. Her view is similar to predictions

# Years the locust is sowing

by Manpower Minister Pietie du Plessis

She says that by 2000, 77% of the economically active population will be African and only 11% white.



Although SA will then depend on skilled black workers and managers who should now be in training, Miss Bot says the recession has led industry as a whole to cut spending on training.

Another problem is the

emphasis on academic schooling and a general lack of interest in vocational education among students of all races

"While skills training is becoming a growing priority, only 10% of South Africa's manpower is being trained in a technical field while 75% should be trained to meet manpower requirements"

KwaZulu Training Trust managing director Brian Stewart looks at the importance of training artisans in the December issue of the IPM journal

Describing the artisan as a dying breed, Mr Stewart says that to replace him it is important to assess industry needs in the light of changing technology, the cost of training and the appropriate skills

He paints a gloomy picture of SA — a decline of 5,5% in the number of people employed in manufacturing industries since 1980, a fall of 5,6% in real output in them,

and an average annual "growth rate" of gross domestic product per capita from 1981 to 1986 of minus 2,1%.

"As the investment in plant, equipment and facilities for apprentice training is high and training is by its very nature a long-term process, employers, industry boards and institutional training bodies will have to re-assess their responsibilities in light of future trends in the provision of skilled workers for the South African economy"

THE need for more education and training in the technical field has been highlighted by two experts.

The first is authoress Monica Bot in a publication entitled Training on Separate Tracks. She says there will not be enough skilled workers to underpin economic growth unless there are dramatic improvements in black education, particularly technical



# Labour productivity up 2,7%

HELOISE HENNING

LABOUR productivity in the private sector, excluding agriculture, rose by 2,7% in 1987 compared with a 0,2% improvement in the previous year, the latest National Productivity Institute (NPI) figures showed.

However, the private sector remains more capital intensive than labour intensive. Employed labour fell by 0,2% to 2,485 million from 2,489 million in 1986. The continued higher usage of capital rather than labour was attributed to the 4,5% rise in capital employed in the mining sector. The gold-mine dominated sector's number of labourers dropped by 0,4% but their real earnings improved by 4,3%.

The capital:labour ratio in the sector rose by 4,9% and output dropped by 3,1%. This resulted in lowering the overall performance of the private sector's

productivity because goods-producing sectors outside of mining generally showed improved productivity.

NPI economist Karen Liebenberg pointed out statistics for the mining sector were anomalous because management was influenced to mine lower grade ore when the gold price was strong. This resulted in distortions in the statistics.

Capital employed in the manufacturing sector has shown a decline since the debt standstill. Capital employed in the manufacturing sector showed a decline of 3,8% in 1987, while labour productivity rose by 3,1%, real output rose by 3,9% and real earnings (adjusted by the

● To Page 2

# Labour productivity up 2,7% in 1987

16,1% inflation for that year) of employees declined by 0,1%

Liebenberg said the improved use of capital in the private sector did not signal overall improved productivity because of a decline in labour employed in the mining sector.

Employment in the manufacturing sector was at 99,9 on the index, an improvement compared with 1986 when it was 99,1 and comparable to the 100 base in 1985

The manufacturing output index for SA in 1987 was 171,1, compared with

166,3 in the US, 106 in the UK, 263,4 in Japan, 635,1 in Taiwan and 879 in Korea (The indexes had a base of 100 in 1970).

Output an hour in manufacturing in SA was 142,9 (135,2 previously), in the UK it was 185,8, in the US 163,9, in Italy it was 218,6 and in Japan 263,1.

In SA, the hours worked in manufacturing were at 119,7 (122 in 1986) compared with 101,4 in the US, 100,1 in Japan, and 57,1 in the UK. No index is given for Korea or Taiwan

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8/Day 5/1/89

# New-look CSIR makes R142,5-m in contracts

179A

By Deborah Smith  
Pretoria Bureau

The successfully restructured Council for Scientific and Industrial Research made R142,5 million through outside contracts during the 1988/89 financial year despite a staff cut of almost 500, according to the annual report.

Dr Chris Garbers, President of the CSIR, said it had almost met the target of R158 million total income, including contracts for the coming year, was over R205 million.

The total staff complement was trimmed from 4 700 at the end of 1987 to 4 272 through rationalisation by the end of 1988. Dr Garbers said the largest source of funding was still the parliamentary grant, though they were expecting increased revenue as commercialisation of technology gained momentum.

He said the income from investigations and services had grown by 16,9 percent while the parliamentary grant had grown by over one percent to 68,7 percent of all income.

## DECREASED

The parliamentary grant was over R196 million. Current expenditure increased by 8,8 percent but the largest component, staff costs, had increased by only three percent. This meant staff costs decreased to 54 percent of total costs compared with 57 percent the previous year.

Dr Garbers said despite the effect of ongoing restructuring, the CSIR had settled into its new structure and general staff attitudes had vastly improved. The CSIR had introduced a new business-orientated financial policy which would ensure its effective implementation.

The newly created Research and Development Implementation Department focused on technological support in the public and private sector. It included 12 divisions and a Centre for Advanced Computing and Development. He said each division was already starting to have an impact.

The CSIR also set up the country's largest capital investment company, Technifin, in collaboration with the Industrial Development Corporation. Dr Garbers said Technifin would play a role in the commercialisation of new technology.



# Unemployment — no light at end of tunnel

"I worry," said Barend du Plessis this week when a colleague asked him what he did for fun.

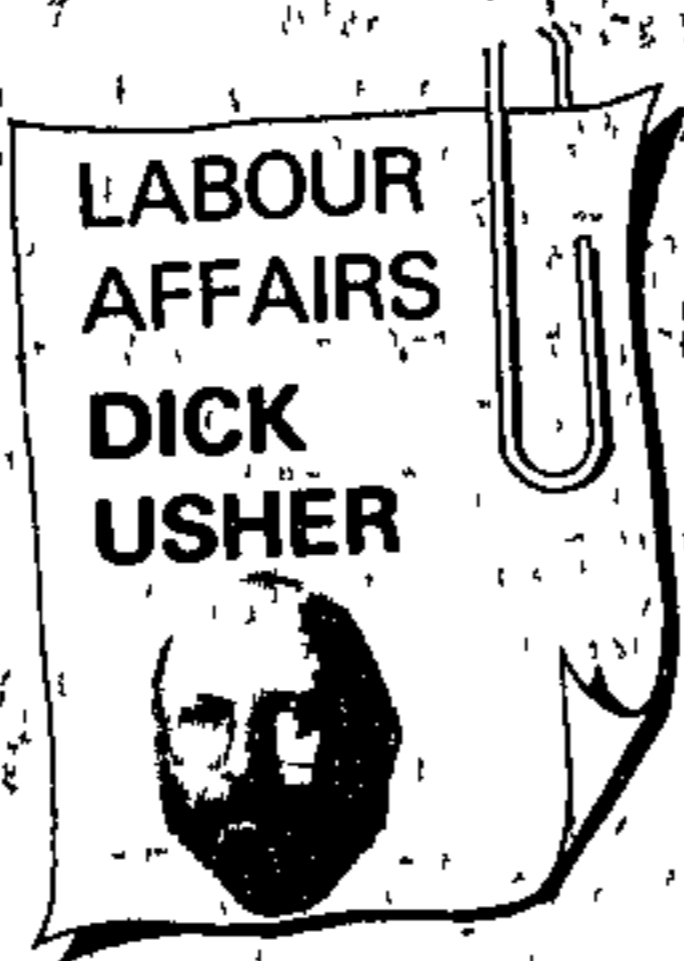
Well might the Minister of Finance worry.

At a different venue, talking to some industrial relations people, we arrived at the vexing topic of mechanisation.

The view was expressed that companies were mechanising because South African labour was no longer "cheap labour". Manufacturers who

wanted to stay competitive both in South Africa and in the export market were being forced to cut costs and one means was to cut jobs.

Along with this goes the understanding that machines do not get ill, take time off, go on strike or (being the ideal servants) require the services of industrial relations practitioners and personnel officers to keep them working moderately merrily



From here it's a swift step to the question of who, if all workers were replaced by machines, would buy the goods produced, it being the general way of the world that no job equals no income equals nothing to spend. And the accountants' bottom-line figures tend to exclude certain social costs built into mechanisation.

The IR people are, however, nothing if not creative

The reply to the question was that forward-looking companies were using a dual strategy — retirement of older workers and retraining younger ones to give them better and more marketable skills.

It's common cause that the abysmal state of black education, along with the fact that low wages make it a struggle to afford education, tends to ensure that the children of unskilled workers will become unskilled members of the ever-increasing and ever less-hopeful band of people seeking jobs in a shrinking job market.

So it seems an estimable idea that companies should, in addition to the other schemes for social upliftment that many are involved in, make a positive contribution to education and training.

A hidden aspect of this is that, in effect, private enterprise is paying to try and remedy some of the deficiencies of the education system.

This point has also been raised about the many training programmes that are embarked on by companies. Which might be one of the matters that Mr du Plessis worries about.

If South Africa can't afford the capital imports that industrialists see as necessary for mechanisation, can private enterprise afford the cost of upgrading workers' skills?

And, while these efforts are available only to those already in employment and may be only a drop in the ocean of ignorance, if we can't afford the cost of upgrading, will we ever see light at the end of the unemployment tunnel?

## 'Ignorance' blocks manpower development

PRETORIA — Major obstacles in the way of manpower development in SA were ignorance and lack of support, CSIR Foundation for Research and Development (FRD) group executive Reinhard Arndt said here yesterday.

Launching the restructured FRD, Arndt said the basic aim of the foundation was the development of human capital in the fields of science and technology.

Universities would be financially helped to establish their own R and D programmes.

Universities were the factories which should supply industry with the right kind

of people.

Stressing the importance of tapping expertise and technology from outside, Arndt said doors were not closed to SA.

Inter-personal contact was the key.

He was not concerned at the so-called brain drain, but mobility of scientists was vitally important.

"We're not very good at attracting back scientists who have left the country, but this issue will be given high priority."

Arndt warned of SA's ageing university teaching staffs and the need for an injection of younger talent.

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GERALD REIBLY

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RAGUS 15/11/88 (179A)

# City spends millions on new machine tools

## Business Staff

ENGINEERING companies in Cape Town are spending millions of rands in up-grading to new CNC (computer-numerically-controlled) machine tools

At a possibly conservative estimate, local companies have in the past year bought more than 40 major CNC machines with an investment value of over R8-million — excluding the substantial purchase by ADE in Atlantis

Mr Ray Cooper of W D Hearn says his company alone has delivered 28 CNC machines of various types and that, relative to its size, the Cape Town engineering companies have led the country in converting to CNC

With each new CNC machine there is a further investment in specialised

tooling which probably pushes new investment above R10-million

From November 16 to 18 an in-house exhibition of the latest CNC and other machine tools is being held in Hearn's premises in Epping

Star exhibit is a Leadwell horizontal machining centre with fully automatic loading and tool changing facilities. This machine, which weighs more than 10 tons and has a value of some R400 000, is the first of its type to be imported into South Africa

The exhibition includes demonstrations of plastic injection moulding, electronic measuring equipment and conventional machining and will have a floor value of R1,5-million.

This specialised exhibition last year attracted 800 engineering people and will probably pull in even more this year, says Mr Cooper.

# Stayaways prompt talk of greater mechanization

CAR-Tips  
20/6/88  
179A

## Own Correspondents

**JOHANNESBURG** — Mass worker stayaways this month has prompted talk of greater mechanization to avoid losing production when workers do not report for duty.

Spokesmen of both the Federated Chamber of Industries and Assocom, as well as economists, noted that a move towards more capital intensive production was a possible reaction from employers hurt by the stayaways.

But an FCI spokesman said at the weekend "One cannot say there will be a move towards mechanization in general. It is a highly specific question to each sector. To some sectors, importing capital equipment would be too expensive.

"But uncertainty on the labour front will certainly be taken into account when a manufacturing strategy is planned"

## Capital intensive

Sectors such as mining and chemicals are already very capital intensive, while for others, such as clothing and motor cars, mechanization to replace the workforce is not a viable prospect.

A mining analyst says that generally speaking, where mechanization can be done, it has been done. He cites examples of open pit coal mining, which is heavily capital intensive.

As to why mines would want to mechanize, the answer is obviously "to cut costs", to "make operations more profitable"

One major mining house says this broader objective overrides the narrower excuse of wanting to get rid of the labour element.

National Institute for Productivity Statistics show that capital input used to generate products and services increased by 25% from 1980 to 1987 while labour input declined by about 2% in the same period.

## Rising trend

NPI economist Roelf du Plooy says the capital to labour ratio has been on a rising trend for a number of reasons and is likely to continue. The trend towards increasing capital input was typi-

cal of a developing country such as SA, he said.

Developments on the labour front had caused employers to think increasingly in terms of mechanization.

However, the figures show that the trend towards using more capital and less labour had not resulted in increased overall productivity.

Overall productivity, as measured by the NPI, had decreased by more than 3% since 1980. This was the result of a fall of 14% in capital productivity (output per unit of capital used). Labour productivity (output per unit of labour used) rose by 9% from 1980 to 1987.

Labour productivity rose as the number of workers declined because of increased capital input. However, the greater availability of capital was not yet employed productively.

In the mining industry, for example, it takes time for the benefits of greater mechanization to flow through.

Cape Clothing Manufacturers' Association Secretary Colin McCarthy said clothing was still very much a labour-intensive industry and mechanization was not a viable prospect.

"Tasks such as drafting of patterns and cutting could be mechanized to reduce the labour force but this would not be viable in SA, simply because the market is too small. The expense could not be justified.

"The clothing industry does not mechanize — it moves," he said, noting that problems would cause factories to close in one area and open up in another where the same difficulties did not exist.

## Production levels

Volkswagen SA spokesman Ronnie Kruger said experience from totally mechanized plants in West Germany has proven that mechanization only becomes economic when daily production levels are at 2 000 cars.

The VW plant in SA, one of the largest local car producers, only manufactures 300 units a day. The entire motor manufacturing industry, which consists of seven

major companies, produce between 1 300 and 1 500 cars a day.

VW now employs 8 500 workers, 1 000 less than it did in 1981 when the car industry was at its crest. However, Kruger points out, cars have become more complicated to manufacture taking up more man-hours than were used in 1981.

Seifsa economist Michael MacDonald says volumes and productivity of members in the last quarter have been better than the best achieved in the industry since 1981. But employment of hourly paid labour has dropped by 37% in comparison.

Indications were that better management and possibly the interference of labour relations were the reasons for a smaller more productive workforce.

Board of Trade and Industry CE Ruel Heyns says mechanization is not the answer to SA's low productivity.

"Planning and innovative management leads to productivity. Its smart work not harder work, not machine input, that will make materials, labour and capital work more productively."

## Short-term profits

Cosatu rejected the suggestion that labour disruptions were directly responsible for mechanization, arguing management was looking for an excuse to win short-term profits while avoiding the real issues.

Information officer Frank Meintjies regarded management's suggestion that the loss of production suffered during work stayaways could be "the last straw" in a swing towards more capital intensive production methods as a case of business punishing workers for ills inherent in the economy.

Meintjies said the economy, rather than the workforce, was unproductive because it was being strangled by monopoly capital and apartheid. This was the cause of the absence of job creation and real investment.

Only a restructuring of the economy could facilitate growth, employment, better housing and a living wage, and this is what management should be addressing.



SOUTH Africa's inability to supply the economy with scientific and technological manpower is alarming, says a report.

The Hidden Crisis is published by the Scientometric Advisory Centre of the Foundation for Research and Development (FDR)

It says that even though scientific education is the driving force behind technological advance with a multitude of benefits, including social progress and economic prosperity, it remains a non-issue in SA, overshadowed by

# Technology slips

politicised problems

Author Anastassios Pouris says that by world standards, SA has a small number of scientists and engineers for every million people. North America is the highest at 126,2, Israel next with 87,3. Europe, excluding the USSR, has 48,6 and SA only 16,6.

Even more important, the number of scientists and engineers emerging from SA's universities is diminishing. Traditionally drawn mainly

from the white population, demographic factors are shrinking this pool.

Evidence of the downward trend is that in 1987, 20 000 fewer white children were born than in 1970.

Dr Pouris says financial incentives and professional aspirations also limit the share of scientists and engineers in the pool of graduates.

"In 1960 more than 16% of all graduates were awarded

first degrees in natural sciences. By 1985 this had fallen to less than 9%. During the same period the share of engineering degrees decreased from 9% to 5%."

In an era of scientific intensification and technological advance that is fast gaining momentum and transforming social and economic spheres, and in the face of the international competition for qualified manpower, the conse-

quences, if not arrested, will be severe.

"We are making the same mistake that the more developed OECD countries made in the 1960s. They believed that, by satisfying the manifest social demand for education, the manpower needs and goals of equality and opportunity would automatically be met."

"However, subsequent experience has shown that neither egalitarianism nor optimal manpower provision was achieved. More importantly, the policy of satisfying the manifest social demand also failed to attain the economic growth objective."

STimes 4/6/84

179A

# DP education needs enhancing

Stev  
29/11/84  
179A

A shortage of skills and a lack of formalised education and training to prepare DP professionals for the changing demands in their careers are common factors in South Africa's data processing industry.

"This training gap between initial education and the secondary skills needed to specialise should be urgently addressed by the DP training industry," says Tim Sargeant, recently appointed manager of SPL's training division

"DP professionals usually enter the field with sufficient technical expertise to handle the initial programming task

"This expertise is gained from a university, technician, a private training establishment or on the job. But shortcomings appear some three to four years later

"That is when more training is required in order for programmers to position themselves for the second phase of the DP career"

There are three areas which must be addressed

by the DP training industry to prepare people at this critical stage of their careers, he says

They are technical specialisation, systems analysis and design, and management or supervision

The technical specialist may choose to become a super-proficient applications programmer or specialise in database operating systems software or data communications

## MAINTENANCE

But where, Mr Sargeant asks, do they go for a proper systems programming education, or even training in database administration and advanced programming techniques?

And what about people who want to specialise in systems enhancement or maintenance?

He says SPL is now gearing itself to provide the necessary training skills for the individual to become an information technology professional, rather than a skilled technician only



13, 1989

If it's  
5/ Times 13/8/89  
easy to  
use, it's  
179A  
good

ONE of the keys to successful office automation is ease of use, says Mel Cunningham, managing director of Pretoria-based DMS<sup>ni</sup>.

"The idea behind office automation is to have a tool which not only makes personnel more productive, but is easy to use. You do not want to hire highly trained staff once you have installed some form of automation.

"What you are trying to do is simulate an office process which was previously done by hand."

Mr Cunningham says one of the major sectors of office automation is word processing and many companies are still doing tasks such as accounting manually — in spite of the number of packages available for it on PCs.

### Afrikaans

"Computer literacy in South Africa has improved considerably in the past few years and has boosted office automation.

"Education has also played a major role and we find that there is a large market in the Afrikaans sector of the market.

"Many more Afrikaans-speaking people are buying computers today than in previous years. They realise that the future lies in computers and are buying machines for their children so that they become more computer literate.

"Considering that 55% of the white population is Afrikaans, we are talking about a pretty large market."

Mr Cunningham regards PCs and fax machines as essential elements of office automation, but believes that fax cards are not as widely accepted.

"The fax card is too complicated for many people. They do not want to go through complicated procedures to send a fax through a PC.

"There is also the visual aspect. Many people do not like reading messages on a screen. They prefer to have a piece of paper in their hands.

"Fax cards are a great idea, but I do not think they are practical."

## Business Efficiency

# Automation takes on a new meaning

S/Times 13/8/89

179A

THE concept of office automation (OA) whereby high-technology products are harnessed to make workers more productive has undergone radical change since the concept was mooted.

OA is no longer a concept restricted to the office environment, says Nashua managing director Jac Moolman. "You cannot have office automation by itself," he says. "The whole country must be in a state of automation before you can have office automation."

"Once you reach the state of factory automation, social automation, office automation and home automation, and when there is interaction between these areas, then automation is taking place."

### Mark Davison

Mr Moolman says three phases are involved in automation.

"Of these three, we have passed through two — enhancement of individual productivity through the delivery of computer power to workers at their desks; and the phase we are passing out of at the moment, the linkage between individuals in the office and between the office and the outside world."

Mr Moolman says the next phase in the evolution of OA will occur as image management products enter the digital mainstream. These products include image storage and retrieval, image transmission and image reproduction.

"We are entering the third phase."

Mr Moolman says the products in the current phase will include the integration of technologies such as facsimile, laser printer and copier.

Although facsimile is still a relatively new technology, it has had a significant effect on the office environment.

"Fax has improved communications dramatically," says Mr Moolman. "Communications are becoming faster and faster and allows office workers to be a lot more productive. Fax has become an essential part of office equipment."

Peter Carides, product manager at Altech Informatics, says fax has not only meant increased productivity among workers, but provides cost savings for organisations.

"Company mail costs dropped dramatically after

the introduction of fax — people are using half the number of envelopes and stamps they were previously."

Mr Carides says people now expect much more from fax machines than they did before.

"People want a variety of features on their fax machines. A trend is to units incorporating a telephone, an answering machine and a fax."

"But people are still looking specifically at communication. The way to communicate is through fax."

Fax technology, he says, enables workers to get on with other tasks.

"The OA concept is total efficiency. When you can make it possible for the office worker to get down to doing his job with as few formalities as possible, then you are



JAC MOOLMAN

arriving at what I call office automation.

"The office is what is automated — not the people in it."



# Marlin to polish own

By Julie Walker

**LEADING** granite producer Marlin has taken a step towards benefiting some of its production with the purchase of Marble Pentelic.

Pentelic is one of South Africa's foremost contractors in processing and application of dimension stone for use in construction

S/Times 10/9/89

## granite

The announcement that 95% of Pentelic had been bought came with Marlin's results for the year to June 1989 during which earnings a share grew by 50% to 84c. The dividend was raised by the same margin to 30c. Marlin chairman Peter Gain says that buying Pente-

lic is a natural extension to Marlin's operations. Marlin is the world's largest producer of Belfast black granite, and a leading supplier of Rustenburg grey as well as various coloured material.

Almost all production is exported as raw blocks to the world's cutting and polishing

centres where it is processed into cladding for buildings and as monumental stones, among other applications

### Booked

Situated in Germiston, Pentelic has been built up by the Kyriakos family, who will stay on to manage the operations. The sum paid for Pentelic has not been disclosed, and its acquisition is not expected to make an immediate effect on Marlin's earnings.

"We aim to expand Pentelic, and it puts us in a position where we are able for the first time to export beneficiated material from our own quarries," says Mr Gain.

The world's dimension-stone sawing capacity is booked for many months in advance, and saw-makers have orders for a year ahead.

Pentelic prepares SA and imported stone to customer requirements. Blocks are delivered and sawn into thin slabs by a machine which resembles a giant breadslicer.

### Smartest

They are then either flame-polished to a rough finish or polished to a shiny one, then sawn into size for use in cladding buildings or for vanity tops and furniture.

Pentelic has clad some of SA's smartest buildings, including JCI House in Johannesburg and Mobil House in Cape Town. It hopes to be involved in First National Bank's Bank City project currently out to tender.

There has been a large swing worldwide by architects to the use of granite, especially since new techniques have made the hard stone more workable.

Pentelic and Marlin have done business for several years.

Mr Gain says Marlin expects higher profits in the current year. The shares are 770c, 9.2 times earnings and on a dividend yield of 3.9%.

## THE WEEK IN BUSINESS

A summary of this week's corporate announcements.

**Monday** — Fintech sells Office Automation to Punch Line for R46-million cash. Fintech to get R2-million a year in fees. It owns 81% of Punch Line, which is to buy Technologies Acceptances for R800 000. NCR to be 51% owned by Fintech. Name of Punch Line might change.

Ellerine to take over the furniture interests of Barnetts.

**Tuesday** — Furntech sells Mr Cupboard to Young World Modulus for R7-million cash. Vadek issues a warning — change of control possible.

Last day to register for Funa shareholders for 57c stand-by offer from Rand Merchant Bank 15 September.

Lefkochrysos to be renamed Barplats Mines. The Brits mine itself to be known as Crocodile River, and the Steelpoort site as Kennedy's Vale Expansion at Crocodile River to be accelerated to 250 000 tons a month by the end of 1992, and at Kennedy's Vale to 180 000 tpm by 1996.

Barplats Mines to raise R300-million, Barplats Investments to follow Vansa — which owns 18% of Barplats Investments — to renounce its rights to shareholders. Rand Mines will follow its rights and will have its own rights offer.

Minorities holding 3.2% of Multisource accept offer of 75.2c a share.

**Wednesday** — Rale to raise R8.27-million at 30c a share, 40 for 100. Last day to regis-

ter September 8

**Thursday** — Standard Engineering buys 67.6% of Astas from Malbak for R20-million cash plus 4.2-million ordinary shares.

Spareco — last day to register for 40c dividend 29/9/89. Gough Cooper issues a warning.

Rusplats workforce on illegal strike following a shooting incident. Production not affected.

Sinclair buys Industrial & Commercial Holdings motor division ICH to make offer to Sinclair shareholders at 180c. Caution in share dealing urged.

**Friday** — Noristan issues a warning. Punch Line's rights offer 82% subscribed, balance underwritten. Sunvest's rights offer 99.8% subscribed and Sunpak's 98%.

Sure Group to issue A variable rate convertible debentures at 60c, 35 for 100 or debentures already held.

Further to Tuesday's announcement, Funa's last day to register now September 22.

Incorporated General Insurance to be known as IGI Insurance Co from Monday. Delswa shares to be split 10 for 1, Jade's 2 for 1 from October 30.

Cortech issues 7 199 760 shares for 8 999 700 CRB.

Primrose declares 4c dividend, or one bonus share for 25 LDR 22/9.

Premier Group's rights offer 99.8% subscribed. LDR for capitalisation issue of Bevcon shares to Premier shareholders 1 for 1 is September 29.

Drivetech — LDR for Tollgate's offer of 75c a share is September 22.

S/Times 10/9/89

## R1m for the bright

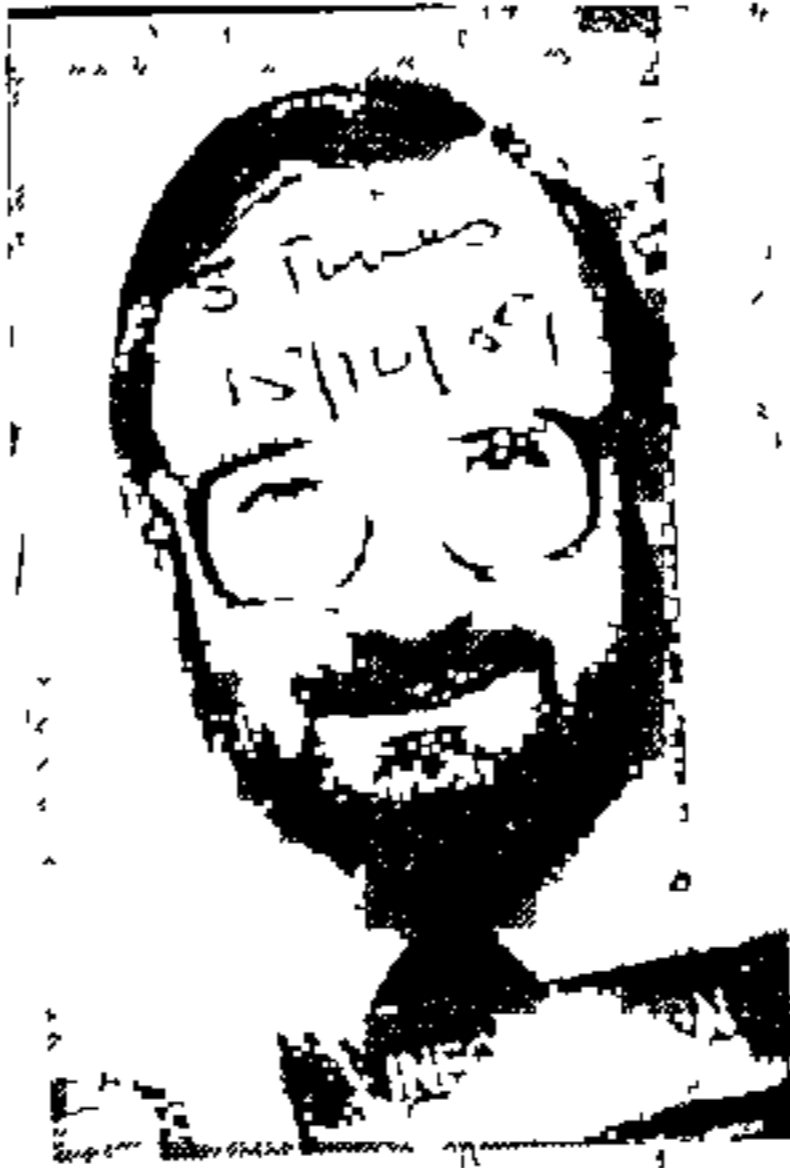
THE Foundation for Research Development (FRD) will award R1-million next year as support grants for outstanding science and engineering students.

FRD group executive Rein Arndt says that although the FRD funds the work of many experienced scientists and engineers at universities, technikons and museums, the importance of supporting up-and-coming scientists has become increasingly evident.

The worldwide shortage of high-level manpower and the ageing of the scientific community are causes for concern, he says.

(179A)

# ARE YOU A



179A NEIL DUFFY  
a treadmill

# Open the IT doors

what systems are available and how to assess whether different systems suit a company's strategic plan

The impressively bound and illustrated book is a 540-page tome covering every aspect of information technology. First the conceptual foundations are given, then strategy formulation and implementation are described.

All aspects of the subject, from gaining competitive advantage from IT, to project planning and implementation, to security and control, are covered. The book has a useful glossary of IT's daunting vocabulary.

Professor Duffy's author is Michael Assa, formerly an academic colleague in SA, now operating his own IT consultancy in Texas.



by **JULIE WALKER**

S/Times 17/12/89

# Home lessons for futures students 179



AS the futures industry gathers momentum — its turnover is approaching that of the JSE's equity market — so too does the need for training.

The industry's public relations body Safia has been appointed the official watchdog over the proposed examinations which futures market participants will have to pass.

In turn, Safia has approved the correspondence course offered by Progressive Systems College (PSC), of Cornishshare fame.

Designed by PSC managing director Nicolas Oldert, the course is for dealers, analysts, speculators, hedgers, brokers, fund managers, portfolio managers as well as

private investors

Using a minute-to-minute simulation of the real markets, the course enables budding dealers and speculators to gain trading experience in the volatile futures and options market without risking their own or their clients' funds.

## LIQUID

The examination is designed to upgrade professionalism and prevent unnecessary losses to investors through misunderstanding of the financial markets.

The markets should become more liquid as more people gain experience in playing them. Nevertheless, there is no guarantee that those who have passed the examinations will not suffer losses.

Mr Oldert is not a futures market fundi himself, but maintains that this has given him the edge to write the course in a way which can be understood.

The standard works of reference on the subject would groom candidates for a doctorate more than a matriculation certificate.

The course comprises 18 home study lessons allowing students to work at their own pace. Tutors can be telephoned to answer questions, and regular meetings will be held by Safia.

The real-time market simulation allows participants to buy and sell futures and options without risk. Transactions are made over the telephone as they would be in the real market.

The simulation runs for 25

weeks from a selected starting date. Weekly progress reports detail all transactions as well as a portfolio summary showing profits, open positions and margin account balance.

The cost of the course is R1 500, and an extra R98 secures a computer pricing model on floppy disk.

The examination can be written at any time at Safia for R150 — it is written on a computer. The multiple choice answers are marked instantly.

Mr Oldert says "Futures and options are the markets of tomorrow. They allow portfolio managers and investors to be more efficient by hedging against adverse price movements, as well as offering speculative profits — or losses — from taking positions."

PEOPLE AT THE TOP  
ARE ON THE MOVE  
SEE PAGE 9

# APPPOINTMENTS

**MANPOWER  
MIRROR BY  
ROBYN  
CHALMERS**

SUNDAY TIMES, Business Times, December 17, 1989 7

PAGES AND PAGES OF THE BEST JOBS IN SOUTH AFRICA

# Engineering the poor relation at university

THERE is solid evidence the link between "winning the prosperity and Government commitment to engineering and technology, says Ove Arudrec for Cliff McMillan.

Mr. McMillan was speaking at this week's graduation ceremony of the Western Cape University of Technology. He said a lack of commitment by the Government and employers had led to a crisis in engineering education.

"Japan produces about 4 graduate engineers per million population. America and West Germany about 350, the UK about 250 and Australia around 220. By comparison SA produces fewer than 40."



CLIFF McMILLAN, SA's vice president of the Engineering Council of South Africa

SA was also producing far too few technicians and technologists, he said. Although there were 267 000 students at 21 universities in SA, there were only 60 000 students at 13 technical colleges. Mr. McMillan, a past president of the

SA Institution of Civil Engineers (SAICE) and chairman of the Engineering Education & Training Committee, said a basic requirement was the re-arrangement of priorities and funds to concentrate more resources on engineering education at universities and technical colleges.

It was widely recognised that university subsidies acted specifically to the disadvantage of engineering education. They were determined largely on a per capita basis, ignoring market forces which should influence remuneration of teaching staff in economically productive fields. The subsidies also took no account of the expensive equipment required for engineering faculties.

It is therefore financially advantageous for a university to accept lower admission standards and admit more students in faculties which demand less costly staff and equipment.

This dilemma could be solved and expenditure limited by a universal raising of university entrance standards and by introducing an appropriate subsidy formula for engineering departments, said Mr. McMillan.

The report proposed that centres of specialisation would provide for the development of students beyond the second year of study.

Mr. McMillan said the most basic problem in the profession was to increase the supply of matriculants capable of studying engineering and technology at tertiary level.

Protec provided informal enrichment programmes to selected high school students last year, nearly 800 Protec students matriculated, half of them with university exemptions in mathematics and science.

STW 1.12/12/89

129



# SA slipping behind in technological field

By Derek Tommey

Unless steps are taken to make better use of the country's mineral resources, the mineral boom may start to peter out — condemning the country to continued low economic growth, warns Dr AM Edwards, one of the country's top scientists

Dr Edwards is president of Mintek, which is not only the country's major minerals research organisation but is also regarded as one of the best in the world in its field.

He warns also that to ensure the necessary research is carried out, South Africa will need thousands more engineers and scientists than it possesses.

Dr Edwards says in Mintek's annual report that technological progress these days accounts for up to 55 percent of a country's economic growth.

## Low growth *star 26/1/90*

South Africa's low growth in recent years could be ascribed partly to not increasing the value of its minerals

In the past 15 years Australia and Canada, two other mineral-rich countries, increased their gross domestic product a head by 26 percent and 46 percent respectively. South Africa's GDP a head had increased by two percent in this period.

This difference, at least in part, is the result of more added value operations in these two countries

"Unless South Africa is able

to exploit its mineral resources to maximum advantage, its market share will steadily decrease and it may find it increasingly difficult to exploit its resources in the future"

He says South Africa must concentrate its research on its minerals as this is an area where it possesses researchers of the highest calibre.

## Shortages *(179A)*

Research in other fields is probably ruled out owing to the sparse number of people with the necessary skills. However, South Africa would still need many more researchers than it has.

It employs roughly 200 researchers for every million of the population. This is less than Peru and Argentina and compares with 4 000 per million people in Japan.

South Africa requires every year about 1000 people with chemical and metallurgical degrees. So far the record number produced by South African universities was 200 in 1986. This year only about half this number is expected to graduate

Dr Edwards says it is vital that black students are made more aware of the importance of technology.

While a large pool of better educated blacks is being created, relatively few go on to study at universities or technicons. By 1984 only 1580 black students had gained diplomas, compared with 42 749 whites.

# Business Day SURVEY

*It is projected that by the year 2000, SA will be short of about 500 000 highly skilled people, from CAs to secretaries to CEs. One way the skills shortage can be overcome is through using contract staff, or temps as they are more popularly known. ZILLA EFRAT examines this R300m industry and some of the people in it.*

## Receiver's clamp-down

A MAJOR concern to the temping industry is the Receiver of Revenue's recent clamp-down on the use of Close Corporations (CCs)

Association of Personnel Service Organisations (Apso) vice-president John Dawkins says negotiations have been taking place between Apso and the Commissioner of Revenue regarding the taxation of CCs.

In September last year, the Receiver issued a Press release indicating that CCs could not contract their services through a temporary staff contractor without being liable for PAYE tax.

Dawkins says this is of great concern as it is be-

lieved that it will drive many CCs underground and away from the legitimate temporary staff contractors.

He says it is also apparent there is no current legislation to empower temporary staff contractors to deduct tax from CCs, the majority of whom are legitimate enterprises consisting of one or more people contracting their services out to many different companies and temporary staff contractors.

### Complexity

Although no directive has yet been received from the Receiver, there is no doubt that he is now more aware of the com-

## Filling the gaps in the computer field

SA COMPANIES, like their international counterparts, are increasingly using contractors to overcome the skills shortage in the computer industry

Don Gray Contracting Partners MD Izabella Little says about five years ago, between 10% to 15% of an Information Systems (IS) department in the US and UK was made up of contract staff. Today this is as high as 40%.

In SA, this figure is between 12% to 15%, but it is growing

Various factors have led to the growth in the use of contract computer staff and the realisation that they are an effective way of filling a company's human resource needs

Little says the local shortage of skilled staff in the computer industry is running at 35%, measured on how many positions are open

This has forced the IS manager to be more creative in resourcing a project

By using contract staff when they are needed, he eliminates the employment of excess permanent staff who sit around when there is no work to do

In addition, SA labour law is being increasingly applied and becoming a greater issue with companies. It has become more risky for companies to employ permanent staff because they cannot get rid of them, says Little

By using contractors, employers eliminate some of the risks

### Productive

She says contractors often tend to be more productive because they are paid by the hour and feel guilty about charging for time they have not worked

CPL Contract Services MD Tony McKenzie says companies are broadening their use of contractors and using their skills more effectively

During the past year, de-

mand for contractors on his books grew by 30%, slightly higher than the annual growth recorded over the last five years

So great is the competition for the services of contractors that McKenzie counsels would-be employers to "sell" the advantages of their companies to contractors

Local data processing staff, including contractors, have become aware their skills are highly negotiable in the international market, exacerbating the skills shortage - to which McKenzie sees no end

Both Little and McKenzie believe the demand for computer contractors will grow in the '90s

McKenzie says management's increasingly strenuous efforts to improve productivity will continue to expand demand for the special skills and dedicated attitudes that contractors bring to the workplace

Little says contracting has become more popular



IZABELLA LITTLE

with skilled computer people as it offers many benefits.

It can be a step towards owning their own businesses, offering them variety in work sites and types, as well as a way to stay out of company politics

Many experienced people prefer not to move into senior management and to remain on the technical side. Contracting allows them to do this.

On the money side, good people who work well will find their earnings higher than in permanent positions, says Little.

# The

# Financial



S/Times 25/2/90

179A

## Focus on networks

**THE rapid growth in the networking of computer systems is one of the biggest factors fuelling the information explosion in modern business. Management of these fast-changing networks is becoming a major challenge for companies involved in the strategic use of information technology.**

**At next month's Computer Mail conference, co-sponsored by SPL, Comtec and First National Bank, two world authorities on networking and telecommunications will examine the critical issues.**

**Leonard Kleinrock, professor of computer science at the University of California in Los Angeles, will examine the evolution of networking technologies and focus on their likely development in the next 10 years.**

**Michael Naughton, chairman of Applied Network Research in the UK, will speak about the strategic importance of electronic communications between companies and their suppliers. Among other things he will review the penetration and potential of EDI.**

**A third international speaker, change management consultant Anna Maria Salehar, a director of the VLD Automation Implementation Consultancy in the Netherlands, will provide a reassessment of office automation for the 1990s.**

**Pepkor executive chairman Christo Wiese will speak about the importance of computer technology in retailing and distribution.**

**The Computer Mail conference will be at the Carlton Hotel, Johannesburg, on March 20. For details phone Peter Aspinall or Louwna Koen at Strategic Business Services (021) 948-1767/8.**

# Hi-tech focus on business strategy

May 27/1990

179A



EVAN DOLD

THE next decade will see far greater focus on applying Information Technology (IT) solutions as part of business strategy, says Deloitte Haskins & Sells management consultants MD Evan Dold

"This trend will be motivated by the threats posed by greater competition, low productivity and volatile business conditions, as well as the high costs of previous low standards applied in IT projects," he says

"Coupled with this is the realisation that effective integration of information is fundamental to successful business strategies"

Computer-aided software engineering (CASE) will play a vital role in helping companies apply IT methods successfully

Dold's company has invested heavily in developing up-to-date design, development and implementation methods.

### Unrealised

"Because technological developments are always in advance of the ability to manage and apply them, the real expectations and benefits from IT developments are largely unrealised"

The industry offers man-

agement aids which focus on integrating strategic objectives and technical designs and close the gap between expectations and reality

The programmes also cover the entire project management cycle, from high-level strategy to the delivery of working systems.

Flexible products, many of which offer visual display characteristics, encourage management and user participation

"This helps ensure congruence of objectives and maximisation of benefits"

A significant industry

trend is consultants' ability to assemble specialist teams (internal and external) to cover the issues involved, says Dold

Increased focus on communications networks brought about by the need to integrate computer systems within organisations will also take place.

### Enhance

Given rising development costs and skills shortages, there will be a greater need to enhance the performance of existing facilities, he says.

Besides the need for functional specialisation, brought about by the esca-

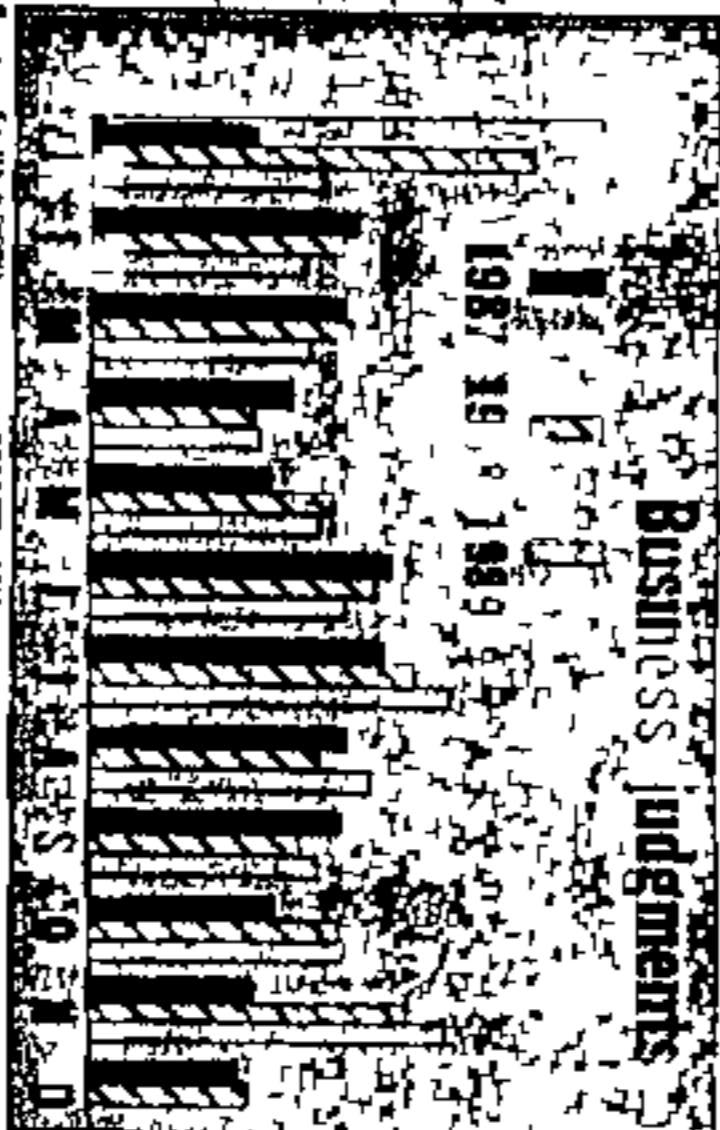
lating rate of change, there is likely to be greater security consciousness.

This is expected to occur where complex communication networks are involved, especially in the public domain.

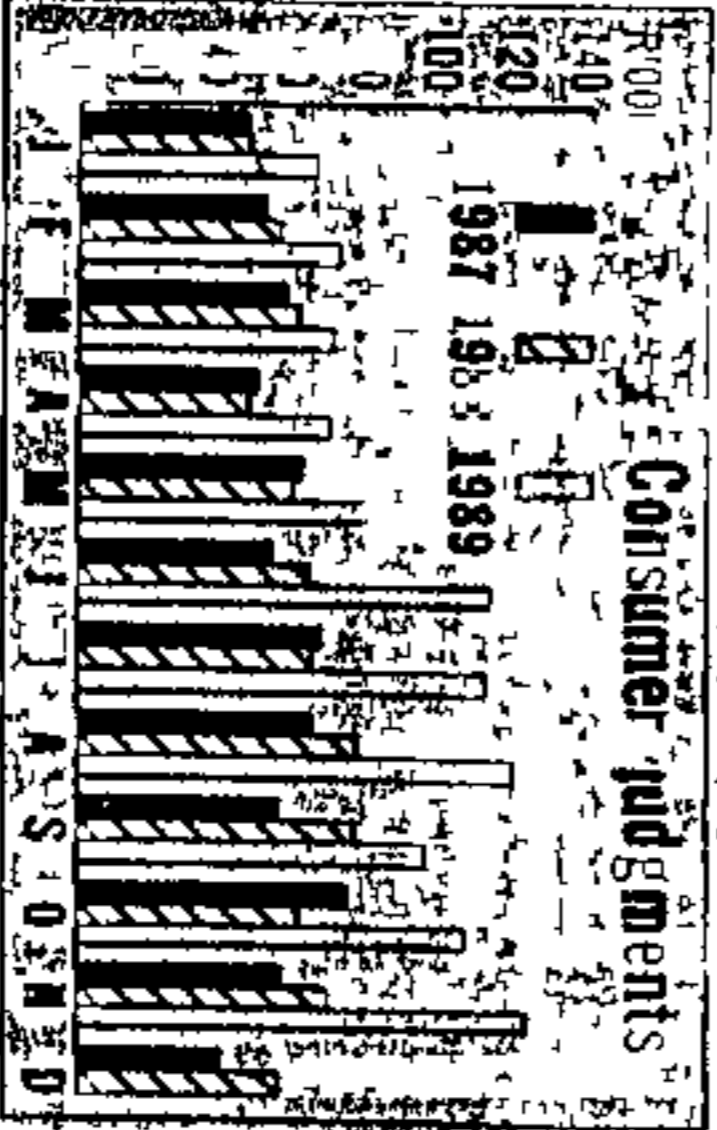


# Business Day SURVEY

Outside the banks, the largest on-line network for customers is Kreditinform, whose Corporate Credit Information Services experienced a 40% increase in demand last year. This year, growth in demand for written reports compiled by the company is running at 29% above last year. Judgments are expected to increase substantially over the next few months, and if interest rates stay high the business sector is in for a tough era of credit management. **MELANIE SERGEANT** reports



A reflection of tough business conditions



The growth reflects tough business conditions in

## Networking growth boosted as demand for information soars

NETWORKING is growing in SA and is being embraced as the answer to immediate information gathering. Outside the banks, the largest on-line network for customers is Kreditinform, and the company's Corporate Credit Information Services have grown faster than anticipated, expected to increase by 40% last year. This year, growth in demand for written reports is running at 29% above last year. The growth reflects tough business conditions in

SA, but MD Ivor Jones says apart from being good for business in general, an important benefit of this surge in demand is that the company's already substantial database is updated more often and increased in size and information. The more research is done, the more the database is updated, he says. Kreditinform's is the country's largest, most up-to-date and most current corporate credit information database. "It's estimated we have up to 70% of the corporate information market in SA and this is growing," Jones says as judgment

are expected to increase substantially over the next few months. Liquidations will follow, and if interest rates stay high the business sector is in for a tough era of credit management. One sure sign that business is under the whip is the large number of companies converting to Closed Corporation, a trend which goes against the spirit of the Act when CAs were launched — the idea was to encourage the informal sector to join traditional business.

**Tough** As tough trading conditions become real to companies, so they are calling for more credit checks on existing and potential customers, suppliers and others with whom they do business.

The Kreditinform Information-Sharing System (KISS) processes some R500 a month of trade reference information with some R6 000 trade references being produced by the system in March alone. Growth has been both short of spectacular, and as it grows, so more companies are contributing information to KISS — a phenomenon spurred by the slowdown in sales with higher interest rates and generally more difficult trading conditions.

The KISS system comprises different industry groupings and reflects information such as the increase in average debt and the percentage of unpaid debts. Because conditions in the



The more proactive credit management industry have become so difficult, Jones says more credit managers are becoming wise to weeding out their high-risk debtors, and raising credit limits on existing customers to whom they wish to sell more.

**Ensuring** Essentially, they are ensuring at an earlier stage of the economic downturn that they will increase sales to the lower risk customers. Debtors are being mentioned into good, medium and bad — and appropriate steps taken to ensure the lower end is properly monitored.

Instead of sending sales people into the field and then credit checking, once they have orders, they are first using our systems to check credit ratings of potential customers. The online system makes this both simple and cost-effective, once the user has paid his subscription, there is no restriction on usage.

Day 27/4/90

# Joint ventures provide new-look facilities

THROUGH strategic moves over the last year, KreditInform is well-positioned as the largest business information supplier in SA

Information is available for virtually all aspects of the business cycle, from details about investment, researching company histories and performance records, procurement details, credit management, marketing and sales

Instead of reinventing the wheel, MD Ivor Jones says the new-look facilities are provided through joint ventures set up with the most prestigious specialist information providers in SA

## Stems

One of the new developments stems from a joint venture between KreditInform and Ezee-Dex, the mining and engineering buyer's guide

The database from this official purchasing reference for the Institute of Purchasing of SA will be downloaded into KreditInform's existing database

"The venture places us in a position to provide procurement information to our existing network users and opens up the network to all buyers so they can access the system for a product, see which companies provide it and check their track records and performance on the KreditInform and McGregors online databases"

Another alliance sees KreditInform linking up with Trade Information Services (TIS), SA's largest tendering service

Buyers and sellers in the engineering, industrial, mining and allied industries, who are already communicating through the Entrac network, will be allowed access to KreditInform's database.

"Their network has access to Entrac, the largest

tendering database in SA. With TIS's 400 online users and its more than 4 000 offline users, communication between all major corporations and service companies in almost every sector of commerce and industry in SA is becoming a reality," says Jones

In TIS's system, users can access Entrac, the merged services of Minelink and Tirandata Desk Top, which provides electronic tendering, purchasing and communication systems for the mining industry, parastatals and other large industrial organisations and their suppliers

TIS MD Cyril Blackbeard says the company publishes formal and informal tender inquiries from more than 4 000 sources in most industry sectors

About 3 000 inquiries are published to almost 3 000 suppliers, resulting in

about 15 000 quotations daily

Future developments include expanding the system into other African countries

Also coming onto the online system are the specialist sales and marketing information services from KreditInform company Matrix Marketing

## Marketing

Jones says "This move sees the facilities available to marketing and sales specialists

"They will be able to access our database, look at information from a marketing viewpoint and analyse it. They will be able to see details like customer spreads, ask for certain limits or geographic details, and request segments of the database online"

(179A)



# Technology 'key' to creating wealth

(179A)  
Business Day Reporter

WHITE fears were not of a black-dominated government or sharing of the country's wealth — the fear was the rapid lowering of standards, said Society for Professional Engineers president Ron Heydenrych.

In his first presidential address to the society last week, Heydenrych said this would not happen if technology was given its rightful recognition by the decision-makers and was seen as a priority in SA's education and development strategies.

"The future of SA will depend on its ability to create wealth."

"There are many components of wealth creation ... However, a key component is the application of technology."

It was unfortunate that in political terms money spent on maintenance carried few rewards compared with

education and hospitals.

"But, if we fail to maintain and extend our infrastructure we will seriously undermine the potential economic growth of the country."

While SA had many fine engineers, there was a critical shortage and it was getting worse, Heydenrych said.

"Even assuming that only half of our population is economically active, we only produce 56 engineering graduates per million of population compared with Japan's 500 and US's 370. In these terms we are hardly in a position to challenge the world."

As a profession "we work in a way which strips away political pressures and because of this unique relationship to society we can make an important contribution to development strategies in SA", Heydenrych said.

# Staff training is a worthwhile expense

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IT'S A fallacy to believe software purchases stop when the sale is made

Companies working from manuals alone could end up using only 50% of their (often substantial) investment

Unskills national marketing manager Mike Shaw says the investment in training can often equal or overtake that made in software, but the rewards are great because productivity is enhanced — and users will know how to utilise their software to its full potential.

He says a major problem in SA's data processing industry is that such a small percentage of DP budgets are allocated to training employees

“Senior management often does not realise that without educating staff, huge degradation in productivity in a very expensive area of the company can be common. If productivity is increased by only a few percentage points the payback is huge

“The problem is exacerbated because in the late

'70s and '80s companies recruited DP people from overseas, but many left again

“This left a massive skills shortage, and many companies still haven't learnt the full value of training their own staff.”

## Monitor

Shaw says companies must monitor their staff's skills levels. Apart from product specific courses and entry level programmer education, Unskills is seeing an increasing de-

mand for analysis and design knowledge

“This focuses on programmers with four or five years of experience who are expected to somehow learn systems analysis skills. As both skills are different, it's difficult for these people to 'port' their knowledge over from one to the other with little or no training”

Seeing this gap, the company has developed a specialised training programme which combines systems analysis and de-

sign into a workshop which covers all aspects of systems definition and design ranging from interview techniques to structure design techniques, presentation techniques, style and report writing

“The course is popular — not least because, although we run it over eight days, only five of these are working days

“We often run courses exclusively for one company or group so its particular problems can be dealt with in more depth,” he says



# Technology exchange plan launched

A NEW programme to promote closer scientific and technological co-operation and exchange of technology between SA and several African nations was launched at a workshop in Johannesburg last week.

Afrotech is a programme initiated and administered by the Associated Scientific and Technical Societies of SA (AS & TS), representing about 63 professional societies and covering the entire field of science and technology in SA.

Organisers hope for future participation by South Africans in activities of organisations such as the Network of African Scientific Organisations, the Pan African Union of Science and Technology, the African Academy of Sciences and the Association of Technicians and Engineers of Mozambique.

"A number of eminent leaders in the fields of science and technology on the continent attended the workshop in their personal capacities and expressed confidence that such co-operation was

**EDWIN UNDERWOOD**

becoming a closer reality in the light of recent changes in SA," Afrotech committee member Teo Louw said.

An SA initiative, Afrotech was created by the integration of two technology exchange programmes, one of them started four years ago by the SA Institution of Civil Engineers (SAICE). This had been merged with AS & TS to form a broader initiative.

**Experience**

Participants in these programmes have come from Lesotho, Swaziland, Botswana, Namibia, Zambia, Zimbabwe, Malawi, Angola, Cameroon, Ivory Coast and Ghana.

Louw said "Despite some of the technology transfer being of SA origin, SA has a lot to learn from the continent's experience of working under Third World conditions."

Louw said that as the programme

had been well received by visiting African delegates, and in light of the workshop's success, Afrotech could look forward to future joint co-operation and development programmes. But the programme's success would depend on political developments in southern Africa and on financial support from local industries.

Addressing the official launch of Afrotech, Prof Chodziwadziwa Mjojo of Malawi said "Developments in the region make SA's formal entry into the continent a possibility, especially as African scientific renaissance is currently on the agenda in Pan-African scientific meetings."

Emphasis would be placed on local development and education to avoid the temptation of mass recruitment from Eastern Europe. He commended the educational initiatives of local organisations such as Protec and the Science and Engineering Association of SA, Seasa.

B1 Pan 28/6/90

179A

## Iscor chairman warns of banana republic

THE main characteristic of the 21st century will be the quantum leap in technological development, and those countries that fall behind will be relegated to Third World status, says Iscor and Transnet chairman Marius de Waal. (179A)

De Waal, delivering the fourth FE Kanthack Memorial Lecture of the SA Institution of Civil Engineers at Wits University yesterday, said the gap between the industrialised countries and the backward ones was likely to increase.

"Our choice is either one of ensuring that through development and application of the intellect of our people we become part of the developing world of the 21st century, or we accept that we will get bogged down and deteriorate and become a banana republic." (179A) 61790

The negotiating of socio-economic reform for SA must simultaneously see to the improvement of the performance of the modern sector of the economy, De Waal said. Sapa.



# Nafcoc plea for SA to stay labour intensive

WILSON ZWANE  
and OWEN MAUBANE

NATIONAL African Federated Chamber of Commerce (Nafcoc) president Sam Motsuenyane yesterday urged businesses not to introduce automation and to recognise that SA was a developing country that needed labour intensive industries

"Mechanisation will put thousands of people out of work. Apparent waves of turbulence such as stay-aways should not make us lose our sense of reality."

He conceded, however, that he had doubts about the effectiveness of this week's nationwide stayaway called by the ANC-UDF-Cosatu alliance.

"We are all concerned about violence. But I am not convinced that the stayaway will end violence in Natal. I believe that all black leaders should come together and negotiate a peace settlement," Motsuenyane said. (179A)

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Embrace

Asked how Nafcoc saw its role in relation to black political organisations, Motsuenyane said: "We believe that collaboration with all groups, rather than being seen to side with one, serves our best interests." South African Black Taxi Association (Sabta) spokesman Fanyana Shiburi said: "Our membership comes from all black political groups and as such we have to embrace all political ideologies."

PETER DELMAR reports that the PAC, one of the organisations leading opposition to Monday's stayaway, yesterday described the protest as a tactical blunder which had backfired on the ANC.

PAC general secretary Benny Alexander said the ANC claim that the stayaway call met with an overwhelming response was based only on figures for four cities and ignored "the hundreds" of towns and cities where workers did not stay at home.

He believed the greatest failure of the stayaway lay in the fact that Inkatha had not been isolated or that the action had not helped curb violence in the Natal/Kwa-Zulu region.

# Barend wants technology, exports and growth

DURBAN — SA's economic problems would not be sorted out on an ideological basis, Finance Minister Barend du Plessis told the Natal NP congress yesterday

"We must mutually decide what the economy should look like at the end of the century

"Only then will we have a chance," he told delegates

"When we talk about the economy of the new SA, it must be restructured to achieve a high growth rate with the accompanying creation of jobs

"This is the vital issue to be pondered by those creating unrest on the labour scene

"We cannot escape from what happened in Eastern Europe — the fun-

damental truths of economy cannot be disputed

"We need a decent, firm and sensible monetary policy — you can't change arithmetic."

He said SA could not be isolated from the movement of economies in the rest of the world

"If we want to see a total exodus, we must embark on a punitive tax system to provide funds for nationalisation."

It was also time people realised that the future lay in technology and not in white-collar jobs

"There are, however, red lights flashing in the area of production going down and salaries going up. This can price us out of the interna-

tional market and trade unions must realise this

"If we can harness the productive forces in SA and take our place with the trading nations, then I can think of no better place to be than in SA," Du Plessis said (179A)

There was a perception that people had suffered under apartheid due to the free market economy

"This is wrong and it will be necessary for us to break that synonym.

"Those stoking unrest must also decide whether they want money for education or if we must spend it on the police and military personnel who have to try and sort out the trouble," Du Plessis said — Sapa

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# Foundation to aid manpower projects

LOCAL trade and industry will gain access to an innovative source of science and technology know-how as a result of the hiving off of the CSIR's Foundation for Research Development (FRD) as an independent council, group executive Reinhard Arndt said.

The foundation has an annual budget of about R120m funded primarily by government.

In terms of The Research Development Act, the foundation will — from October 1 — play the role of independent facilitator and broker in bringing interested parties together in pro-

B109 14/9/90

MARIETTE DU PLESSIS

179A

jects. Arndt said the foundation's independence was in line with CSIR's policy to align itself more closely with commerce and industry.

This would not only add impetus to existing activities, but also allow greater flexibility in addressing the market's needs where the development and maintenance of expertise, knowledge and skills in the fields of science and technology were crucial to future economic growth.

However, for the foundation to be

successful in contributing to wealth-creating manufacturing industries, it needed to work with industry so that everyone could become more involved in the improvement of skills through education.

Arndt said the foundation was endeavouring to build bridges between individuals and develop networks of specialists in the development and implementation of available technology.

The foundation had been involved in several projects aimed at developing local science and technology resources, since its inception in 1984.

# People are critical for achievement

B. J. P. 20/9/90

179A

WITHOUT its people, FNB's Information Systems Division (ISD) would not have reached the heights it has

However, the skills shortage in SA, specifically in information technology fields, is staggering.

Assistant GM, personnel, Noel Agar says skills are critical to FNB's competitive advantage.

The shortage of skills must be seen in a global context. The economic scenario is central to human resource issues — both locally and globally

## Exceeds

Fierce global competition impacts on key IS skills acquisition and retention

Skills demand exceeds supply internationally, and the situation will not be changing in the foreseeable future

Nevertheless, ISD boasts staff turnover rates which are half the industry average.

He says the shortage of high-level technical skills is exacerbated by the stringent tests for entry into the field.

"Standards are necessary, but there are few opportunities for the 'late developer', who may have the skills but can be locked-out because of these stringent criteria."

For these reasons, ISD is concentrating on the growth and development of its staff.



NOEL AGAR

"The industry must redouble its efforts in identifying where the shortfalls are and put in huge investments, which aren't simply financial but also job related, to overcome these problems

"We've recognised, for example, that DP managers are often more concerned with the projects they're working on and don't have enough concern with the growth and development of their people"

Now, DP managers at ISD must accept responsibility for growth and development of their staff

They are effectively in the teaching business, as their example will eventually be recycled by their subordinates.

Eventually the DP manager's behaviour permeates to customer level, so it must be focused and positive

This new mindset has brought about new norms and business practices, and Agar says personnel must be in a position to foster these.

Another factor in the staff shortage equation is the information which IS staff provide to users

## Wastage

"We're studying the demand for information, having recognised that our information must be treated as an asset

"There is potentially a large amount of information wastage because people don't place enough value on it

"If there's incorrect demand for information needs in an organisation it's inevitable there will also be incorrect demand for the human skills necessary to provide this information."

Agar says many organisations don't have the correct measure of their information needs IS people are often too willing to provide systems for users, increasing the demand for their resources

Once one has a true picture of information demands, it's easier to get the correct idea of manpower demands From here, one can focus on where staff are needed



# Restructuring offers training opportunities

B107 2011170 179A

THE impact of technology on the Information Systems Division (ISD) on end users and customers has been nothing short of staggering

In five short years, the bank has developed a network of some 680 ATMs which allows customers direct access to their accounts instead of having to go into branches and interact with tellers.

This, says ISD assistant GM personnel Noel Agar, has led to organisational restructuring and opportunities to flatten management hierarchies or pyramids.

"We are effectively 'rightsizing', so we are removing some layers in the pyramids and redeploying

people. Retraining opportunities abound."

The bank is also taking steps to improve manager to worker ratios to take advantage of technology and cut the level of bureaucracy common with hierarchical structures

## Interactive

This is making the bank a less structured and more interactive organisation, which is benefiting the group and customer alike

"We're effectively altering job roles. The responsibility of people and skills needed differs from past requirements"

While some staff adapt readily to the changes, others resist it, but the bank offers counselling to ensure

those resisting can be taught new skills which make them happier about their changing roles

Job descriptions in the information systems division are also changing. Wider job descriptions are becoming common so staff can perform a few different functions

"These changes, in turn, impact our recruitment, training, staff appraisal and compensation systems," he says

It's obvious that with flattened pyramids and "de-layering", the organisation is changing career opportunities, so FNB has rationalised opportunities for career growth among its IS staff and this has ensured more stability

# Steep fall in jobs in computer industry

179A

B 10am

25/10/90

Reports by  
**MELANIE SERGEANT**

THE number of jobs available in the computer industry could be almost 50% down on six months ago

According to CPL permanent placements MD Peter Maybury, the situation is deteriorating, in line with slower growth in industry generally.

"Projects are being put on ice or even cancelled in industries ranging from insurance to manufacturing," he says

Employment decisions are being postponed, leading a few smaller agencies to rationalise or even shut down

Computer Users Council (CUC) president Cees Roon says for the first time since the council started its exams for the industry, there is an oversupply of entry-level programmers.

Maybury agrees "One of the large schools is asking us to find jobs for its graduates — a function normally performed by themselves without difficulty"

Intake figures for recent exams increased to 1,140, a 26% increase on May 1989 figures and an 8% increase on November 1989 figures

With this scenario it's easy to under-

stand that second-rate people are not getting a showing, and many who would normally have a job in line before their notice period is up no longer find themselves in this position," says Maybury

Apart from this, a growing number of job applications are filtering through from East Europe

Maybury says he receives about five applications a day, way up on figures six months ago

"Most of these are Bulgarians and Russians, and we've been able to help a few, placing three last month," he says

Don Gray Careers MD Allan Gordon says his company receives five to 10 applications a month from people in various countries, but this is not significantly higher than in previous months

He is less pessimistic about the industry's shrink-rate, saying it is about 30% down on six months ago

Maybury says the cutbacks are not limited to the computer industry, but are endemic across all sectors



# Revamp at Iscor works to cost 1 800 jobs

A TOTAL of 1 800 jobs at Iscor's Pretoria works — about 25% of the total — will be lost during the steel giant's modernisation and rationalisation programme.

A statement issued yesterday said the reduction in the number of employees would take place during the next three years through transfers to other Iscor centres and not filling vacancies. However, some retrenchments would be necessary.

The modernisation programme aims to change technologically obsolete processes.

The programme will also contribute towards Iscor's total environment protection

LIZ ROUSE

programme by limiting pollution

The commissioning earlier this year of the technologically advanced Corex plant for production of liquid iron was part of the programme. (179A)

Also planned is the commissioning of a continuous slab caster and ladle furnace for the steel melting plant, the decommissioning of plants for the conventional casting of steel, soaking pits, blooming mill and rod mill, and the commissioning of a heavy mill reheating furnace

01/01/13 Lead/9

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# South Africa's lack of scientific skills disastrous

Sowetan 4/11/90

17411

SOUTH Africa's future welfare may rest heavily on its ability to resolve a crisis in black education.

"I think it is no exaggeration to say that our future constitutes a race between education and disaster," says Kennedy Maxwell, former president of the Chamber of Mines mineowners' association.

Maxwell is one of many prominent businessmen to voice concern over the critical lack of skills needed to support a prosperous post-apartheid society.

## Education

"To say that there is an education crisis is a gross understatement," declared John Kilroe, chairman of Shell South Africa.

Brian Clark, president of the state-funded Council for Scientific and Industrial Research, describes the country's technological backlog as frightening.

"Today anyone worth his salt in the developed world knows that science and technology are the major levers generating economic growth," he says.

Yet in South Africa, scientists and engineers make up only 1,7 percent

of the population, well below the world average of 2,3 percent and nowhere near the 8,5 percent of Israel and 12,6 percent of North America.

Maxwell says vocationally-oriented studies which have produced economic revolutions in Pacific countries such as Taiwan and South Korea are virtually unknown in South Africa.

It has 23 000 artisans in training when it should have 100 000. Compared with Australia's 800 000 students in technical education, South Africa, with double the population, has 60 000, he says.

The crisis has its roots in an education policy instituted by Hendrik Verwoerd.

As Minister of Native Affairs in 1953, he introduced Bantu Education, portraying blacks as fit only for menial work.

"What is the use of teaching a Bantu maths?" Verwoerd once asked. "There is no place for him in the European community above the level of certain forms of labour."

The Government spends nearly five times more on a white child's education than it does on a black child. The result, by some estimates, is that up to a half of the country's adults are illiterate,

while half of school-age youngsters do not attend classes.

Those that do are crammed into dilapidated, overcrowded schools where textbooks are shared by up to three pupils.

Malnutrition stunts potential. Black teachers are underpaid, many of them are underqualified, and there are far too few to cope.

Of every 10 000 black school entrants only 130 achieved school-leaving certificates last year. Only one of those passed with mathematics and one with science. A mere two percent of black adults continue formal studies beyond school.

## Uprisings

Black uprisings in the 1970s and the 1980s, which spawned the slogan "Liberation before education", contributed to school boycotts and what commentators call a lost generation.

"A situation in which a school certificate is a far less effective weapon in the battle for jobs than is a driver's licence, provides a strong disincentive to learning," the Standard Bank Investment Corporation remarked in a recent review - Sapa-Reuter.



## ANC to host talks on science policy

179A ALAN FINE

THE ANC is hosting a major conference on a future science and technology policy, with private and public sector and international specialists, including a World Bank senior consultant, taking part.

Convenor Ania Grobicki said about 150 people were expected at the November 24 conference at Wits University.

Grobicki said the private and public sectors, particularly Eskom, had been trying to discuss the subject of a future technology policy with the ANC and the conference was aimed at laying the groundwork for continued talks. *BIDM 16/11/90*

World Bank official Peter Glenshaw, an ex-South African, is attending in his personal capacity. However, it is understood the bank backed his attendance.

Jean Leger, of the ANC's science and technology group, said the conference would begin examining options including the question of whether the state should develop a technology policy or whether this should be left to the market.

Leaders of workshop discussions will include Eskom corporate strategy manager Jaap van Deventer; UCT Energy Research Institute's Prof Anton Eberhard, CSIR president-elect Brian Clarke; patent attorney Chris de Villiers, Foundation for Research and Development president Reinhard Arndt, the US Information Service's Henk Muller; and a German Ministry for Research and Technology senior official, Prof Porschlegel.

**DURR'S MIXED BAG**



**Trade & Industry Minister Kent Durr's** long-awaited draft report, on technology policy and strategy was finally released this week and as it turns out, it has something for everyone.

179A

For companies that just want government to get out of the way so they can obtain the latest technology and expand their businesses, the report recommends reducing tariffs on imports. But for those companies which believe hi-tech development will go nowhere in SA without a handout from government, the report calls on government to provide funds to stimulate the industry

The *FM* obtained a copy of the report in advance of its public release later in the week and was, therefore, unable to obtain comprehensive industry reaction to it.

Durr says the report is intended to stimulate debate that will help government formulate its official technology policy

Compiled by the Department of Trade & Industry, it claims government can play a "supportive" role in accelerating technological and industrial development. For starters, it recommends establishing assistance programmes for technology-intensive sectors. The most likely candidates appear to be the chemical and engineering industries.

The programmes are expected to be modelled on a pet project of Durr's — a five-year, R200m funding scheme for the local electronics industry that was unveiled last December. The money is aimed at offsetting part of the cost of developing products with potential for export or import replacement and R30m has been dished out so far. A panel comprising members of the department and the Industrial Development Corp is controlling the purse strings. Under the terms of the "kickstart" scheme, the panel provides up to 50% of the development costs in grants or loans. The money is issued in instalments as the project meets predetermined objectives.

Such temporary funding is likely to be welcomed by industry. However, the report's proposal that the State should harness its buying power to encourage technology development and even identify long-term areas of research is unlikely to succeed. The Standing Committee for Electronics, formed by government in 1984 to encourage State organisations to buy locally designed and manufactured electronic equipment, has met with limited success.

The report attempts to justify the intervention in the market by saying it would act as a catalyst to encourage technology development and subsequent economic growth. But industrial policy has never really worked in SA, in fact, any country's efforts to pick winning industries and companies are bound to end up picking more losers.

The report does acknowledge these pitfalls. "By leaving the initiative for the identification of projects to industries, support for technology projects is generic and minimises

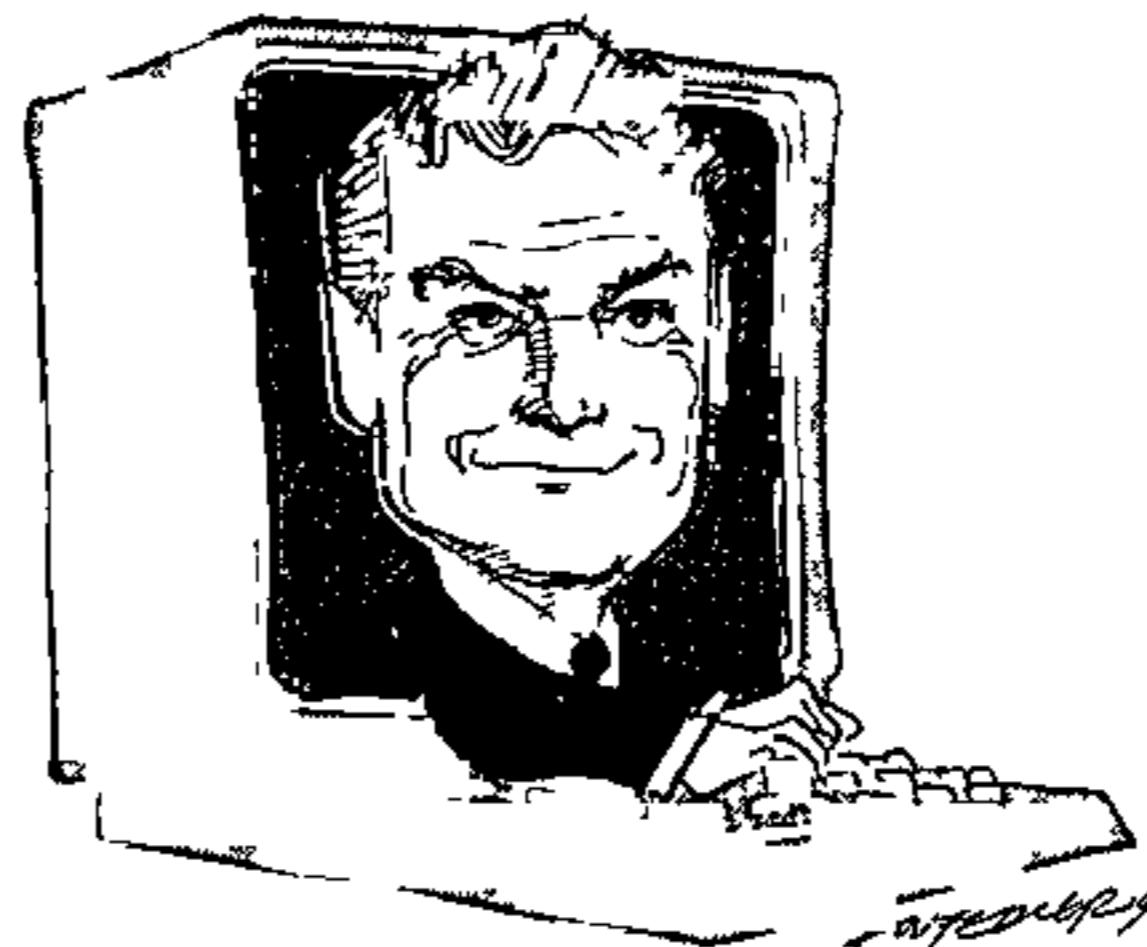
**BUSINESS & TECHNOLOGY**

179A

FIM 23/11/90

selection by government," it says "Consequently it does not distort market forces but accelerates growth where the private sector has identified market opportunities." It adds that the General Agreement on Tariffs & Trade opposes permanent subsidies but allows grants for research and development.

The good news is that the report proposes that government "re-orientate the education system towards a more technological inclination." It calls on government to avoid monetary and fiscal measures that hurt industry — an example was the imposition of import surcharges in 1988. And it recommends that the State "gradually lower protection to en-



hance competition" and create a more consistent and attractive climate for investment in technology. But it doesn't urge that protection be scrapped completely, nor does it give details on how this attractive climate would come about.

While SA may be a developing country, the report stresses that investment in technology — either in manufacturing or in the production of hi-tech goods — will improve competitiveness, stimulate industrial growth and create jobs. And it emphasises the importance of technology in reducing the country's dependence on low value, primary products in favour of higher value goods.

Simon Cashmore



## Farmers 'must supply what consumers want'

GERALD REILLY

PRETORIA — Farmers would have to supply what consumers wanted and were willing to pay for, if they wanted to stay in business, Agricultural Development Minister Kraai van Niekerk said in Stellenbosch yesterday. *Biday 23/11/90*

Speaking at the Nietvoorbij experimental station, he said the consumer wanted environment friendly products and "we will have to supply them".

The burden of financing agricultural research, had been borne almost completely by government, he said.

Important contributions had been made by several organisations, but the long-term security of agricultural research had been guaranteed by government.

He said innovations, rethinking of "solved" problems and adaptations of techniques previously thought of as impractical in agriculture were needed.

"And this clearly spells just one thing — research. And research is expensive," he said.

## SA technology policy: govt invites comment

*Biday 23/11/90* ZILLA EFRAT *179A*

TRADE and Industry Minister Kent Durr yesterday announced the release of a discussion document on technology policy. It aims to stimulate comments from the private sector which will be used in formulating government policy on technology early in 1991.

The document reviews the role of technology in industrial and economic growth and the desirable level of government involvement.

The objective of technology policy was seen as moving the output of industry up the ladder of value-added towards more technology-intensive products in order to create more employment and to raise the level of remuneration of labour.

The discussion document was prepared by the Department of Trade and Industry (DTI) at Durr's request.

It can be obtained from the DTI's Directorate of Technology Promotion. Comment must be submitted by December 31.



### AUDIOBUILD HOLDINGS LIMITED

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(Registration No 05/23582/06)  
("Abacus")

#### Extension of last day to register for the renounceable rights offer by Adbuild

Further to the announcement on 19 November 1990, shareholders are advised that, owing to unforeseen delays, the last day for shareholders of both Adbuild and Abacus to register for the renounceable rights offer by Adbuild has been postponed to Friday, 30 November 1990. The salient dates of the rights offer are accordingly expected to be announced in the press on Wednesday, 28 November 1990.

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# Talks on science

23/11/90  
179A  
A CONFERENCE aimed at bringing together supporters and members of the ANC who have an interest in technology and its development will be held at the University of the Witwatersrand tomorrow.

Motivated by the shortage of technically qualified people in the country because of the poor quality of education, the conference is also aimed at developing a technology policy.

The day's events start at 9am with the opening address by Mr Mohammed Valli of the ANC's political committee and Professor Pomshegel of the German Ministry for Research and Technology.



# Government should move to motivate private industry, says report

A MAJOR policy report on technology says industry should be motivated to add more value to its products.

The move could be brought about by government lowering protection in a bid to stimulate competition.

This would oblige companies to invest in the development of new product and process technology, and to promote trans-sectorial adjustments away from artificially viable industries to activities with real comparative advantage.

The report, released on Friday by the Department of Trade and Industry (DTI), is intended to generate comment from the private sector to help government formulate policy.

The report says government should consider fiscal incentives to stimulate technology development in SA. Such development, which would increase SA's competitiveness, should be market-led and initiated by the private sector.

In the longer term, government could take the lead and collaborate

ZILLA EFRAT

with the private sector to formulate a broad strategic plan to prepare SA's economy for the 21st century. Government support should be confined to initial, temporary support.

The report also recommends that government promote technology transfer from abroad by creating a positive climate for investment through appropriate fiscal and industrial policy measures. (1794)

More specific strategies should be developed for beneficiation, value adding and accommodating the circumstances of a developing population in the technological environment.

Other recommendations include re-orienting the education system towards technology, enhancing the interface between educational institutions and the private sector, and applying the public sector's buying power to greater promotion of technological development.



# Conference ends ANC's isolationist policy

THE ANC's weekend conference, Toward a Technology Policy for SA, effectively ended the organisation's support of a policy favouring the international scientific community's isolation of SA.

The conference was attended by about 150 people, representing public and private sector corporations and specialists from public research institutes.

ANC political committee secretary Mohammed Valli Moosa told the conference the fact that senior officials of organisations such as Eskom and the Atomic Energy Corporation were discussing techno-

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logical matters with the ANC was an indication of how far SA's transformation had gone.

The ANC was hoping consultations begun by the conference would lead to the development of an SA technology policy. The ANC was "acutely mindful of the fact that economic growth is to a great measure driven by advances in technology", Valli said.

Other groups and corporations represented at the conference included univers-

ity-based scientists, Waste-Tech, ISM, the CSIR, De Beers, Sacob, the Chamber of Mines, Anglo American, the Development Bank of SA, Mintek, SA Housing Trust, Sasol, Foundation for Research and Development, SA Federation of Civil Engineering Contractors, HSRC, Bosch and AECL.

Prof C C Mjojo, president of the Nairobi-based Network of African Scientific Organisations (Naso), said his organisation was awaiting signals from the ANC to begin interaction with SA scientists.

Valli told Mjojo that the isolationist poli-

□ To Page 2

## Conference <sup>179A</sup> <sub>26/11/90</sub>

cy had been directed against the "apartheid regime". Mjojo's presence showed that interaction had begun.

Mjojo said Naso felt that economists had failed to supply answers to Africa's development problems during the past decade. The scientific community believed the answers lay in technology, and it was up to it to supply the impetus for development.

He said Naso was attempting to imbue African heads of state with the importance of scientific advancement. It had managed to convince Kenyan President Daniel arap Moi he should call a summit of 16 leaders to focus attention on this need.

## 179A □ From Page 1

As the first conference of its type, areas of consensus were limited, and further meetings were envisaged.

Valli said that, in the past, technological advancement in SA had been skewed to meet goals necessitated by apartheid and its consequences.

The ANC was looking at developments in countries such as the US and Japan to see whether it was better to allow industrialists relative freedom, providing incentives for beneficiation, or to constrain them, making them focus on products it believed had a better chance of competing on world markets.



# Retrenched workers get helping hand

By JOSHUA RABOROKO (179A)

*Sowetan 26/11/90*  
WITH the current slow economic growth rate and many South African companies retrenching workers in large numbers, a bookkeeping company has started a new division to handle laid-off staff.

Pressure on the job market will also increase with the return of thousands of exiles who will need help to find employment or start their own businesses in order to create job opportunities.

The Academy of Computer Bookkeeping CC, has started services, which include courses on how to get a better job, how to start your own business, strategy sessions, the use of facilities and advice and assistance on preparing a superior curriculum vitae

The academy's placement division's executive, Mr Bill Nourse, said many companies in the mining, banking, computer and defence industries who were retrenching staff felt a moral commitment to help their laid-off workers to get back on their feet.

However, because of the competitive nature of the job market, many people, especially blacks, were not getting sufficient expertise to cope with the demands in the fast changing technological and commercial environment.

He said that people were starting to realise that the days that employees could remain with one employer all their working lives were probably over forever.

"Employees are realising that they have to constantly improve their skills and improve on their curriculum vita and be able to competently market their skills and abilities when they need to get a better job."

Courses offered by the academy include. basic manual bookkeeping, bookkeeping on computer, PC computer operation, financial management on spreadsheets and word processing and date base management. The courses have been designed by and are under the supervision of Chartered Accountants.

# E PURGE ON HOLD

sible for regulating the use of radio frequencies, introduced fines of R2 000 and R10 000 for people caught using or selling illegal cordless phones. Then, a few months later, it announced that it would approve the sale of cordless phones for the first time, but only 900 MHz devices that met its specifications.

The technology used in these high-frequency products means they are considerably more expensive than the phones which operate on the lower frequencies.

Telephone Manufacturers, the sole supplier of standard telephones to the Post Office, is the only company that has so far been granted approval to sell its 900 MHz cordless phone. The public outcry over the cost of its Uniden phone is understood to have deterred other companies from applying to have other 900 MHz phones approved.

The delegation due to meet Post Office officials this week is expected to challenge claims that 46/49 MHz cordless phones interfere with other radio equipment or impinge on the frequencies used by various emergency services. These phones are used in the UK, US, Canada and Australia as well as SA.

Adding weight to calls for less restrictions in the cordless phone market is DP MP Tony Leon who has slammed the Post Office for its "sod the consumer attitude." Leon, who claims to have used a low-frequency cordless phone for five years, believes the current regulations are unnecessary and ill-conceived. He plans to take up the matter with the minister responsible for the Post Office, Dawie de Villiers.

If the Post Office relents and allows the use of 46/49 MHz cordless phones, it will deliver a severe blow to Telephone Manufacturers. The company, owned by Plessey SA and the local subsidiary of GEC, has spent more than a year preparing to enter the commercial market with the Uniden.

At the time of the launch last month the company expected to sell 10 000 machines in the first 12 months. Marketing manager Peter Johnson says the company is still on course to meet its projections but is negotiating with its local supplier to reduce the cost of the machine. The current landed price of the phone, including import tariffs and surcharges, is about R1 650. ■

## TECHNOLOGY POLICY FIM 30/11/90 TALKING CHANGE

The ANC is likely to join representatives of business and science in responding to the draft technology policy issued by the Department of Trade & Industry last week.

ANC political committee secretary Mohamed Valli Moosa told delegates at the organisation's technology policy conference in Johannesburg at the weekend that the ANC would react to the draft policy within the next few weeks. The ANC's response is expected to be strongly influenced by the discussion at the conference.

The event, described by Valli Moosa as the ANC's first step in drawing up a technology policy, attracted more than 150 academics and industrialists. They included senior representatives of the SA Chamber of Business, CSIR, Foundation for Research Development and the Atomic Energy Corp, as well as the German Ministry of Research & Technology and the Network of African Scientific Organisations. Thin on the ground, however, were people from outside business and formal research organisations.

Many delegates were surprised that the ANC should bother to include science and technology in its political agenda.

"The mere fact that they are talking about technology is great," says SA Engineering Association president Roy Marcus.

His enthusiasm is understandable. Though the application of technology has a tremendous bearing on industry, employment, education, health care and indeed the whole economy, government is only now acknowledging its importance.

Trade & Industry Minister Kent Durr hopes to establish a formal technology policy by early next year. Until recently, government's main concern was simply to ensure that the country was as self-reliant as possible. Technology spending in the public and private sectors was largely concentrated on armaments, petrochemicals and atomic energy. FIM 30/11/90

A far wider and more efficient application of technology is the aim of both government and the ANC. Both stress the implementation of such a policy requires a balance between State and private sector participation — though views on the extent of this partnership are likely to differ considerably.

The details of such policies remain vague. CSIR president Brian Clark points out, for example, that much of the Trade & Industry document goes over old ground and the real test of its worth will be how it shapes government policy and whether this policy is implemented. (179A)

One delegate remarked he had reservations about some recommendations in the Trade & Industry document but was wary of criticising it too sharply for fear that this could scupper government's plans to establish a technology policy.

Then again, much the same could be said of the ANC's initiative. ■



**O**N NOVEMBER 24 the ANC brought together representatives of many different constituencies interested in technology, with the goal of putting the issue firmly on the political agenda.

The conference enabled a wide-ranging exchange of views to take place as a step towards devising a technology policy for SA.

Technology vitally affects all of our lives. Technological choices shape our living and working environments. More fundamentally, the level of technological advancement underlies the ability of the economy to change and develop in certain directions, and the pace and flexibility with which such changes take place. In the framework of a mixed economy, public and private sector corporations, small businesses, trade unions, academic and training institutions, professional bodies, research organisations, community groups and school teachers all play important roles in the establishment of a technological culture.

**T**he process of technology policy-making must encourage participation by all these actors. This is why the ANC is initiating a public debate on some issues around technology. We hope this will provide the basis for a balanced, democratic process of evaluating our position in the technological stakes, and what needs to be done about it.

New technology and innovation are the wind in the sails of a buoyant economy. New technology at present encompasses areas such as information technology, biotechnology and new materials, as well as the new production technologies SA needs to build on its existing technological base to create networks of expertise in each of these developing fields. We will then have the knowhow to choose between importing certain technologies and developing them here. Research and development funds must be wisely allocated to strategic projects in the new technology areas, as well as towards innovation in existing technologies.

At present only 0,88% of the GDP goes into research and development in SA, as opposed to around 2,5% in

# Technology is too important to leave off political agenda

B 10<sup>th</sup> 13/12/90

ANNA GROBICKI

winning countries such as Japan, Germany and the US. Among all the competing demands for public money in crucial areas such as housing, education and health, we believe it is unforgivably shortsighted to spend such a relatively small proportion of GDP on research and development. SA should aim to spend well over 1% of GDP on R & D, or we can never hope to improve our standard of living and technological advancement.

A large proportion of this increase should come from the private sector, which accounts for only 28% of total R & D funding. In most developed economies, private sector R & D accounts for over 40% of the total. SA industries spend only half as much on R & D (as a percentage of their budgets) than their foreign counterparts in this country, despite the fact that the latter do the bulk of their research back home.

Hence the private sector must be encouraged in various ways to intensify R & D efforts. One way of doing this is by tax incentives, another is to facilitate the transfer of technology and collaborative research efforts between industry and academia. What is needed in terms of policy is the creation of an enabling environment for R & D to take place.

devised by economists and applied in a blanket fashion as part of an industrial strategy, can often have unforeseen effects on technology and technological advancement. Policy formation must proceed industry by industry, and sector by sector, examining the effects on technology of a given measure. Export promotion needs to be tackled in a similarly detailed fashion, as it is in South Korea.

**T**here exists a wide range of policy instruments which could be used in developing an industrial strategy. In addition to those mentioned above, the possibilities include: registration of licensing agreements, the patent system and intellectual property rights, joint ventures and technology transfer, subcontracting, industrial financing mechanisms, the purchasing power of the state, price controls, control of technology imports and control of foreign investment. These need to be discussed and carefully examined in consultation with industrialists.

In keeping with the ANC's broad vision, we believe that a national technology policy must also examine the factors determining the technological base. Here the key is techn-

cal education, which in SA is woefully lacking. Each year we produce 35 engineers per million of the population, compared with Japan's 500. In addition, technician and artisan training is far below the levels required to develop and maintain a sound technological base.

One of apartheid's legacies is that we are barely tapping our population's pool of potential technical talent. Broad initiatives are required to turn this around, including working back not just to primary school level but to people's perceptions and prejudices about technology.

There are certain strategic sectors of the economy which require policies of their own because of their peculiar importance. In SA these sectors would appear to be energy, minerals and water resources. Technology policy must take the needs of these sectors into account and integrate them with other areas.

Energy policy, for instance, will look very different when it is driven by the requirements of urban and rural dwellers, rather than by strategic imperatives such as the threat of oil embargo. Creators such as the nuclear industry and Sasol have contributed to SA's technological pre-eminence in a few narrow areas. The chemical industry has gained enormously by Sasol's existence, but at what cost? Opening up these issues to public debate is surely the

first step in a democratic decision-making process. Finally, we include two policy areas which have received insufficient attention in the past, but which should play a vital role in the future: the environment and rural technologies. Environment policy is an enormous area, but from the technology point of view it is possible to identify some key issues.

Principles such as "the polluter pays" have shown encouraging results elsewhere, in terms of industries introducing waste minimisation strategies and developing waste disposal technologies. Specific technologies such as fine gas desulphurisation (FGDS) and platinum converters are being actively promoted elsewhere — why not here? The relative costs and benefits must be carefully examined.

Rural technology includes a range of enabling technologies to improve living standards in rural areas. These can be high tech or low tech, from telecommunications to biogas digesters to transport.

The common factor is the development of rural areas, with employment generation and raising of income levels as associated goals. Our technological base is very strongly city- and industry-orientated, a clear example of bias.

**P**olicy-making structures themselves need to be overhauled. The present system rests heavily on the Scientific Advisory Council, which is made up of 14 appointed members. The Advisory Council for Technology is reputedly defunct. We would argue strongly for a Ministry of Research and Technology to ensure that the issue is kept high on the political agenda.

Most important of all, there must be an ongoing, multiparty consultative process within which different interests are represented. Technology is too powerful a player to leave out of the democratic arena.

□ Grobicki is a senior lecturer in chemical engineering at Wits University, and a member of the ANC's interim science and technology group. She was the convener of the recent ANC conference Towards a Technology Policy for SA.

# ANC reacts to technology report

8124 14/12/90 179A  
ZILLA EFRAT

THE ANC has criticised various aspects of the Department of Trade and Industry's draft report on technology policy and strategy.

In a statement released yesterday, the ANC's interim science and technology group called for a consultative, multipartite process of policy-making — particularly in the area of technology.

The group said no technology policy could be effective unless it came from a legitimate government elected by the people.

It believed the report was limited by its focus on the manufacturing industry and that it ignored various aspects.

The department's report, released towards the end of November, aimed at generating comment from the private sector to help

government formulate a policy on technology early next year.

The response to the report follows an ANC conference on technology held towards the end of November.

The group said a valid technology policy needed to develop out of the political priorities of government which would inevitably include jobs, education and urbanisation.

It also said the report ignored the considerable impact of various government policies on the public sector, including parastatals, and thereby their massive potential for the development of technology.

The group said it was crucial to strengthen the manufacturing sector of the economy as part of a

long-term strategy for economic development.

However, the underpinnings, namely education and infrastructure, transport and communications, were so weak it was essential to attend to these as part of a long-term strategy rather than to merely tinker with monetary and fiscal measures such as tax incentives and tariff barriers.

The ANC welcomed the emphasis on export promotion in the report, but said this should not occur at the expense of successful local industries.

The group said: "We see selective measures, rather than blanket policies, as essential in encouraging industries and creating jobs." Policy formulation was an ongoing process.



# MANPOWER - TECHNOLOGICAL CHANGE

1991

**T**HE basis of international competition is undergoing a sea change. Cheap raw materials and cheap labour are of declining significance. Competitive edge increasingly requires the capability to produce differentiated quality products and respond rapidly to market changes. There is a growing consensus that technology development will be essential if local industry is to be internationally competitive.

The Department of Trade and Industry's (DTI) recent Draft Report on Technology Policy and Strategy envisages a significant role for the private sector in technology development. But the DTI is also explicit that "with a view to long term technological and industrial growth, reliance on existing private sector firms and the interplay of market forces is not adequate."

The DTI advocates scenario planning to select winning industries and consequent research and development programmes which will provide a "launching pad for the envisaged industrial thrust". This is in accord with the industrial and technology policies of many newly industrialising countries (NICs). It is also similar to some policies advanced in the ANC's Harare Document.

**A**lthough the report advocates that the state pursue an active policy, it is short on specifics. Other countries' experiences suggest the state can play a far more creative role in developing technology than the DTI has recognised. This is particularly true in two areas technology transfer and the development of local technological capabilities.

Technological change in SA occurs mainly through technology transfer from abroad via licensing agreements. Agreements are monitored by the DTI solely to determine that royalty payments are not "excessive". The report recommends that monitoring be extended to minimise clauses which restrict exports. Since export restrictions are a widespread feature of the agreements (for example, only four of the 17 major agreements now operative in the telecommunications industry are free of export restrictions) this is a welcome

# State can do more to help develop local technology

8/Dec 1991

DAVID KAPLAN

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development.

However, the report ignores other restrictive clauses also commonly present in SA companies' license agreements. In many other countries grant-back provisions — requiring the licensee to transmit free of charge to the licensor any improvements in the technology — are prohibited or transmission must be reciprocal.

Similarly, requirements that inputs be acquired from specified suppliers, often the licensor or subsidiary, which perpetuate import dependency, are generally prohibited elsewhere but not in SA. Developing countries' governments have generally been successful in reducing the incidence of restrictive clauses.

Until 1986, the DTI approved agreements with 10-year durations. Since then, approval has been for five year agreements. This is in line with standard practice.

However, while the licensee is required to provide data on the likely impact of the technology in general, employment and exports and substituting for imports, this plays almost no part in the decision to register an agreement.

Moreover, there is no requirement that a licensee seeking to renew an agreement demonstrates that projected impacts have transpired. In a number of developing countries both

the registration and renewal of agreements are subject to intensive scrutiny and monitoring of their macro-economic impact.

In SA as elsewhere, most technology suppliers are large international firms with considerable experience in technology licensing. Recipients are much smaller local companies with limited experience, resulting in unequal bargaining over the terms of technology transfer.

In a number of countries, licence registries are taking a more proactive role, providing local firms with information on the most common and desirable conditions, such as royalties, duration and export clauses, for technology contracts worldwide in different industries.

**T**his information is invaluable and the DTI should consider taking similar steps. This could be considerably enhanced when SA achieves respectability and gains access to information provided by the UN Industrial Development Organisation's (Unido) Technology Information Exchange System.

Further, few agreements entered into by SA companies have a training component. But training is often essential if the recipient is to acquire an intimate knowledge of the techno-

logy and the capability to make modifications and improvements.

Assimilation of imported technologies has been most effective where governments have insisted that comprehensive training programmes be included. This has been widely practised in the NICs. Were the DTI to take a similar stance, this might augment considerably the skills of the workforce.

This would be in accord with the emphasis that some employers and particularly the union movement are placing on skill upgrading.

In developing local technological capability, R & D expenditure in SA (0.86% of GDP) is low in comparison with many other countries.

The DTI is concerned to encourage local firms to devote more resources to enhance their own technological capabilities.

In SA, government is committed to phasing out special tax incentives whereas elsewhere extensive incentives are given for technology development. The DTI recommends therefore that government provides cash incentives for technology development on the leg-up principle of direct support for defined projects of limited duration.

But a number of important issues are not addressed by the DTI. Firstly, R & D is skewed in SA with some "strategic" industries —

for example armaments and atomic energy — possessing relatively high levels of technological capability. How can such capability be redirected to other more appropriate uses in post-apartheid SA?

Secondly, there are a number of technologies such as biotechnology and new materials under development. Local companies will not be at the forefront of such developments, but in several industries some capacity will be vital for survival.

A number of companies in the chemical industry, for example, have accordingly invested quite heavily in biotechnology research. Steps will have to be taken to ensure that there is not under-investment in new technologies which take considerable time to develop and which are therefore not susceptible to encouragement on the leg-up principle.

Thirdly, individual SA companies are able to devote very limited resources to R & D compared with the large international players. The DTI does not consider how government might limit fragmentation and facilitate co-operative research projects between local companies or between the state and local companies — endeavours which have been very successful in the NICs.

**T**here are other omissions in the DTI report. In particular there is no indication of how government might encourage the more rapid diffusion of new technologies, especially new systems of best practice organisation of production, which promise major gains in efficiency.

While the broad drift of the DTI report is a welcome departure from previous governmental neglect, it is still too closely tied to an ideological position whereby, in the words of the Minister, "maximum reliance should be placed on private sector initiatives and market forces".

This severely circumscribes appreciation of the role that the state could play in SA, as it has in many of the successful NICs, to enhance technological dynamism.

□ Kaplan is Associate Professor in the Department of Economic History at UCT and Director of the Development Policy Research Unit. He is the author of *The Crossed Line*, a study of the SA telecommunications industry.



# 500 000 black people face bleak future without work

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Sowetan 25/2/91  
(BOP)

AS the country reels from the effects of the economic recession, more and more people find themselves having to face a bleak future without jobs.

During the past five months more than 500 000 black people were unemployed throughout the country, according to the Department of Manpower.

Mr Johan Muller, an official of the Department of Manpower, said the actual figure recorded was 540 128, but added that this "was the tip of an iceberg"

He said this figure could be more than tripled as it only recorded the number of people who had registered as being unemployed during the past four weeks with his department.

"There are obviously a large number of people

**By IKE MOTSAPI**

who have been unemployed for many years now," he said.

"So, the actual figure is not known, but I know that it is very high," he added.

He was supported by Mr Isaac Pathle, the managing director of Labour Watch, an organisation that monitors the unemployment situation of blacks in the country

## Millions

"If we take that into consideration, then the figure of people presently unemployed in the country, could rise up to millions," he added.

He said an average of 20 000 blacks register every month to be placed in jobs while more than 36 000 people are paid

certain amounts of money under the Unemployment Insurance Fund (UIF).

The department describes workseekers as a person older than 15 years, not compelled to attend school and who voluntarily report at Manpower offices or its agents with the purpose of being placed in employment

Muller added: "In the past, the registered unemployment figure reflected bona fide workseekers who registered at the Department, as well as unemployed contributors to the Unemployment Insurance Fund who were capable of and available for work and, who were required to register for work before they were entitled to apply for unemployment benefits.

"Such a person is required to sign a prescribed unemployment register regularly as proof of his continued unemployment, but does not necessarily re-register every month.

## Register

"As the statistics were derived from the placement register, the registered unemployment figure, was suspect.

"For this reason, and as from July last year, a new method was introduced where, inter alia, also data from the UIF

was brought into the account.

"It is, unfortunately, not yet available in that format," he added.

# Shortage of 'true' skills creates a niche

B/day 13/2/91

WITH many companies opting for their own IT divisions, how do so many consultants stay in business?

KPMG Aiken & Peat Management Services IT practice MD Rob Katz says "Consultancies exist because of the shortage of 'true' skills

"The bottom line is that we act as facilitators in transferring knowledge and skills

"When it comes to IT and its implementation, corporate management can sometimes be myopic. On the other hand, a prophet from another land tends to be heard more readily.

## Change

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"As facilitators, we are also helping to bring about change, especially when companies grow or downsize their computer operations

"There's a niche in the market place which we are filling"

He says a lot of consultancy work is built on an innovative approach to project management, around what he calls "runaway systems"

This is when objectives are unclear, projects run over budget, deadlines are missed and real costs become blurred

"Another area is customisation, where we offer efficient implementation of packages and systems that are cost effective"

He says the employment rate in IT is flat at the moment.

"Companies are not recruiting new people and not filling vacancies when people leave.

"This means we are often called in to look at methodologies and procedures, software development and systems implementation — even project management — the 'heart' of how the IT department is run — and come forward with proposals on how to streamline operations"

ISIS's Dr Carl Neethling says the use of consultants depends on the organisation and the nature of the problem

"There's nothing that beats experience, and clients can benefit from using consultants with relevant experience

"This is especially relevant with the skills shortage it is often not cost effective to employ people at the level needed at a given time because after a project is over their skills may no longer be needed"

Another view supported by many consultants is that in-house staff often have their own interests at heart, and because they can't afford to erode their own power base they will make decisions to support it

## Dangerous

"This can be dangerous for the company as a whole," says Neethling

Kessel Feinstein Horwath chief executive Graeme Victor says an important plus for management consultants is their objectivity

"This is important when a company is selecting or changing its IT strategy. In-house staff are often trying to further their own career paths, so their decisions can be affected by their ambitions and can be detrimental to the company's well-being.



CARL NEETHLING

"This is especially true in corporate environments, where users will often end up with systems they believe they should have rather than those which they need because they are not objective enough in their outlook"

Another problem in using in-house staff is that people handling strategic IT decisions often have experience with only one or two systems or architectures

"This means they may not be equipped to assess new systems — something good consultants are able to do because they deal with a number of clients and different technologies"



It is that time of year again when workers' strike action costs employers millions of rands in revenue and the talk in the boardroom shifts to mechanisation. But are people really being replaced by high-tech machinery or are employers just blowing off steam? **Waghied Misbach** investigates.

**MACHINES** do not go on strike, take time off or need good working conditions to keep them working happily.

It is the ideal situation to increase productivity while keeping staff wage costs at a minimum, employers maintain.

But the above scenario is an employer's utopia. The reality is that South Africa has an extremely fragile economy which discounts the possibility of widespread mechanisation, experts argue.

Massive retrenchments, a natural consequence of mechanisation, would mean workers would have no income and would thus be unable to buy the products made by the machines that replaced them — a vicious cycle, experts say.

Employers reply that situation can be solved by increasing training. But the sad state of black education and the low wages of parents will ensure their children remain unskilled.

### Recession

Figures from the Manpower Minister Mr Prete du Plessis in 1989 indicated that by the year 2000, there would be a shortage of 200 000 skilled workers if the two percent annual growth rate continues.

But the current recession in the economy has meant industry as a whole has cut spending on training.

On top of all that, skills training is not taking place in the crucial technical fields. Reports indicate that 10 percent of South Africa's manpower is being trained in a technical field, while 75 percent would be required to meet future manpower requirements.

The manufacturing sector, which experts consider will take over from the shrinking mining industry, has shown little growth in productivity or provided the expected jobs. This is despite capital intensity in the manufacturing industry growing steadily for more than three decades.

# Mechanisation? Bosses' Utopia?

South 28/2-6/3/91

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**UNWANTED?** Farmworkers such as these must fear for their jobs with the increasing mechanisation of their industry.

Experts maintain that the government has been encouraging capital-intensive, rather than labour-intensive growth.

Capital-intensive investments like Iscor (iron and steel), Sasol (synthetic fuels) and Armscor (armaments) were established by the government from 1924 onwards. Foreign investors also played their part. By 1975 there were almost 700 subsidiaries of American and European companies.

"The bottom line is that manufacturing has not generated growth in output or productivity, despite the increase in capital intensity, and has not created new jobs," says a report from Interfund, an influential London-based fundraising consortium.

At Iscor, 1 800 jobs will be lost at its steel plant's Pretoria works due to its rationalisation and modernisation programme, according to reports. The modernisation programme aims to change "technologically-obsolete processes".

According to the Steel and Engineering Industries Federation (Seifa), the metal industry is expected to cut 37 000 jobs from a total of 387 000.

Strikes over wages have exacerbated the situation. In the first half of 1990, strike actions resulted in the loss of almost 1.2m workdays.

But while strike action is usually the spark, it is not the sole reason for the increasing boardroom talk of mechanisation.

Mr Colin McCarthy, executive director of the Chamber of Commerce, says strikes are not the reason for employers' increasing talk of capital-intensive production.

**PIC: PAUL WEINBERG**

He argues there is a myriad of factors involved, competition with cheaper overseas markets being one of the major reasons.

McCarthy says labour unrest merely accelerates unproductivity.

Inflation rises because people are asking too much in wages for the same level of production. That is why South Africa's inflationary rate is 14 percent, compared to that of Europe's average of three percent, McCarthy maintains.

To counter businesses closing down, McCarthy believes trade unions and employers have to work together to increase production and thus workers' wages.

"It does not mean working harder, but working smarter."

A researcher for the South African Labour Development Research Unit (Saldru) at UCT disputes McCarthy's assumptions.

"All this is being blamed on the poor worker again. Studies that have been undertaken in the informal sector of the clothing industry in parts of Cape Town have shown workers get much higher wages because the management layer of the equation has been cut out."

He argues, however, that mechanisation is part of the broader problem of unemployment in the country, where the total level of employment has risen by only six percent in the period 1980-1988.

"The growth in overall employment can be contrasted with the estimated annual increase in the number of jobseekers of over three percent."

"That means it makes it extra difficult for new job seekers to get jobs. The political implications of the problem is enormous," he said.

In industries where mechanisation seems most likely to happen, it is not financially viable.

In the motor industry, for example, mechanisation will be profitable only if at least 2000 cars are produced daily. The entire motor manufacturing industry, which consists of seven major companies, produce between 1 300 and 1 500 cars daily, according to 1988 figures.

### Viable

The clothing industry is in a similar position McCarthy says the clothing industry is still very labour intensive, mechanisation would not be viable.

The agricultural sector seems to be the most hard hit of all industries in terms of loss of jobs, according to Interfund.

It reports that the Central Statistical Services (CSS) estimate that employment fell by 9.5 percent in 1988.

This sector employs the most people — 600 000 on 65 000 farms — with another 600 000 employed as casual labour.

"The employment implications of the shift to mechanised, large-scale agricultural production have been drastic," reports Interfund.

"On highly-mechanised farms, wage increased 250 percent, but the number of workers permanently employed fell."

On the Anglo American Corporation's Soerfeld farms, for example, labour usage fell from 34,1 to 1,8 workers for each 100 hectares.

Everyone seems to agree that mechanisation is important for the development of the South African economy, but the government's resources are strained.

The backlog in investments and technology will require billions for a competitive economy.

Already, social spending to correct the imbalances of apartheid will amount to about R75bn.

# Resizing IT division the 'key to survival'

TO MAINTAIN their competitive edge, companies are downsizing, right-sizing, and resizing as they restructure their operations. *By [unclear] 14/3/91*

Vice president and chief information officer for US-based Armco Steel, Tom Lutz, who is discussing these issues at a seminar in Johannesburg on March 18, explains that companies are faced with the need to cut costs and to do things in a new way to survive and succeed.

## Information Technology MELANIE SERGEANT

"Traditional-ly, organisations are structured on what they have done in the past, and must now restructure or resize their operations

"Studies in the US show that in most cases, reducing staff and still continuing to do things the traditional way doesn't work.

"In the 80s, Fortune 500 companies cut out 3.2-million jobs. Yet it's believed that today there is still 25% fat in these companies

"Companies are realising that to compete on a global basis, they must get more results from fewer people. Resizing means putting the right talent in the right place

"In the 90s, it seems we must take another 25% of people out of business — not to cut costs, but to make companies more responsive; larger companies are more resistant to change."

Companies most successful at resizing are those which take on new cultures to fit in with changes. Staff must continually change and learn to do new jobs.

Lutz reckons a problem for many is that they try to streamline things that should not be a concern

IT is a tool to help companies resize in the right way, but IT is often one of the slowest things to change.

The computer systems put in place to support the way the company works are often built for the "old style" of doing things

"IT staff say it will take five years to rewrite their old systems, but companies can't survive waiting for IT, so one of the first departments which should be resized is the IT division

"The answer could be to move work which needs to be done here to outside companies"

Lutz says one company which had a system development cycle of four to five years has seen this fall to seven to nine months by outsourcing development and maintenance of critical systems.

He argues that the single hindrance to matching the changing organisational structure of companies is the resistance to change of IT staff

"Downsizing of IT departments which was predicted in the 80s hasn't happened. We've moved more of the Information Systems function to users, but IT staffing is the same size.

"My company has seen the number of its minicomputers rise from 10 to 40, and PCs from about 25 to 5 000, and its mainframe computing load has increased by 30%.

"We're restructuring the IT architecture to match our business needs — and this doesn't necessarily mean less cost, but rather increasing productivity"



# Business Day SURVEY

*Last year's tough trading conditions left their mark on the earnings of pulp and paper groups Sappi and Mondi. But despite the slowdown, both have embarked on huge capital expansion programmes. The easing of sanctions will give local producers a boost, enabling them to re-enter long closed markets. ZILLA EFRAT reports.*

## Office technology boosts paper sales

A POPULAR belief is that new technologies will lead to a paperless society, but at the moment this is far in the future.

Mondi's Merbank paper division marketing and sales manager Mike Stewart says new technology in office equipment, particularly laser printers and telefaxes, has boosted demand for paper.

Demand for Rotatrim photocopy paper has increased with the widespread use of laser printers and telefaxes as business communication systems.

Stewart says:

"High demand growth for cut papers is coming from the trend to link high-volume, high-speed laser printers to mainframe computers, replacing impact or dot-matrix printers using continuous forms.

"In lower volumes, this is also happening where laser printers are coupled to PCs."

Stewart says laser printers are also essential to desk-top publishing, an increasingly popular medium by which companies can produce their own product, mar-

keting and sales literature.

The overall effect of this trend is that the photocopy paper area of Mondi's business is growing strongly in volume terms.

There are several other factors boosting demand. Telefax machines provide only an original copy and if the document requires inter-office distribution, it has to be photocopied.

As telefaxes operate on thermal paper, it is also common practise for the original document to be photocopied for long-term filing or archiving.

### Colour

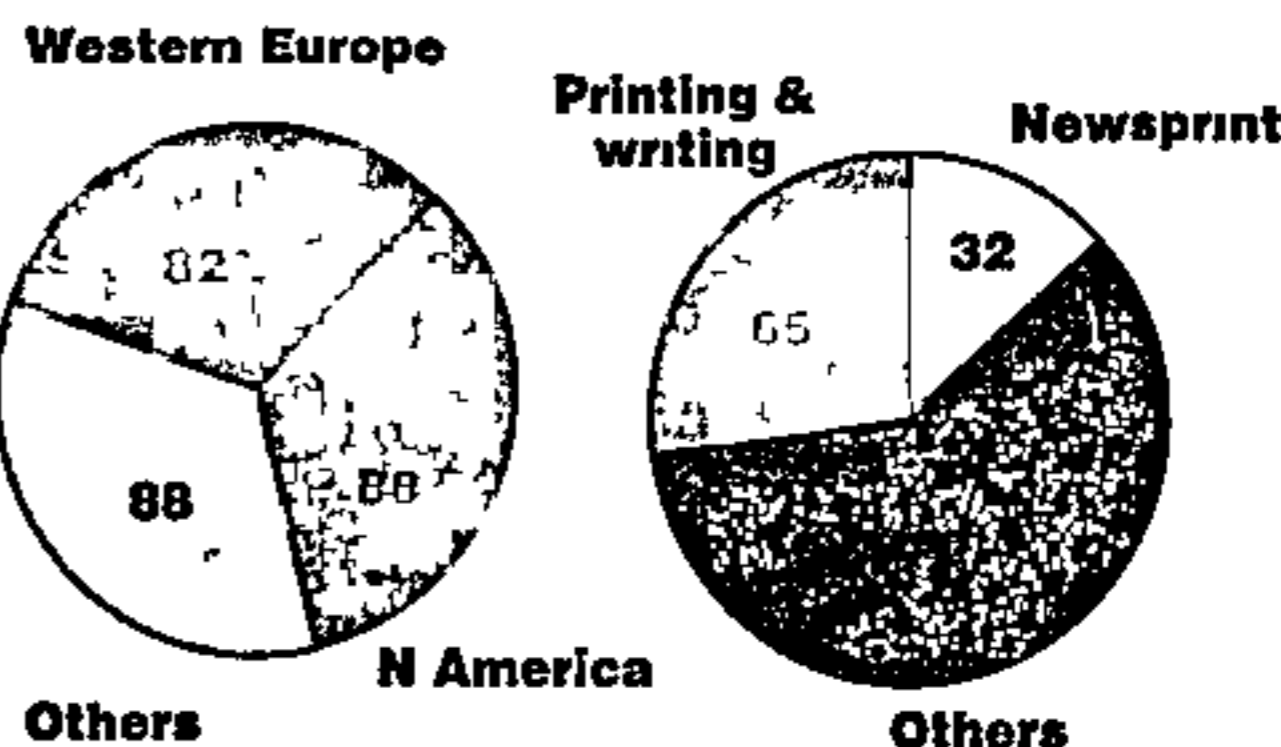
Also, some originals, particularly those printed in colour, can only be faxed in photocopy form.

Stewart says high-value telefax machines operating on ordinary photocopy paper are also becoming popular and are also contributing to increased photocopy paper demand.

Other growing areas in office papers include A4 sized note pads, self-adhesive note stickers and stylised security access and egress forms.

## Worldwide paper & board production 1989

238 million tons paper & board



Graphic: LEE EMERTON Source: 3rd INTERNATIONAL BUSINESS PLANNING CONFERENCE (PARIS)

## Consumption is expected to show steady growth

PAPER and pulp consumption is expected to show steady growth this decade, which could be boosted by developments in Europe.

According to Ekono's studies, the average growth rate to the year 2000 for pulp will remain at 1.5%, while paper will grow at about 2.6%.

Davis Borkum Hare analyst Pierre Greyvensteyn says that since 1970 world paper consumption has been growing at an average of about 3% a year.

In the '80s, however, growth accelerated to 3.6% in spite of the recession.

The US is the leader in per capita consumption of paper, at 310 kg

### Asian

But densely populated Asian countries, which are net importers of paper and pulp, are coming to the fore in world paper consumption.

Greyvensteyn says an important development for the paper industry is the European market in 1992, which is set to be-

come the world's largest market

European per capita paper consumption today is only 45% of the US's

Worldwide, paper and board production is estimated at 238 tons, with North America the largest market, followed by Western Europe

### Slow down

Greyvensteyn says growth has averaged about 3.6% a year during the '80s, but is forecast to slow down to between 2.6% and 2.9% in the '90s.

However, with the advent of a single European market in 1992 and following the developments in Eastern Europe, Europe should emerge as the largest market for paper and paperboard consumption

Greyvensteyn says environmental pressures and increased usage of recycled paper have resulted in an immense change in the circuit of raw material

As a result, growth in market pulp should be lower relative to paper and board

BIP Day 14/3/91

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14/3/91  
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## Computer Faire may draw 350 companies

GROWING demand for information — and products which can assist in providing it — is reflected in the success expected at this year's Computer Faire, BEA Exhibition and Computer Faire Career Centre.

This year will probably see about 350 companies exhibiting at the show from June 12-15, and, according to the fair's Norman Arcus, this indicates the importance of computers is growing (179A) (120)

"From the year 1800, information doubled every 50 years, by 1950 information doubled every 10 years, and by the year 2000 it will double every three years.

"The computer revolution has played a major role in escalating change, and as more companies need powerful information resources to increase their competitiveness, it's expected to speed up."

It is estimated that there are already more than a million local area networks (LANs) installed worldwide, and that this will double in 1992.

"The 30-million PCs in use by 1992 are expected to be attached to some 33-million devices such as printers, storage devices and other computers.

"Although SA's computer industry has seen growth slow to about 16% in the last year, there are still opportunities for growth — particularly in niche markets," says Arcus.

Fair co-ordinator Alice Goldman says that with political changes in SA, overseas companies which have previously not shown interest in exhibiting are now keen to do so. The fair could therefore be expected to show a range of new products and services.

# Numsa homes in on training

Bipau 2/3/91

THE National Union of Metalworkers (Numsa), in its first round of national wage negotiations in the automobile, tyre and rubber and manufacturing industries, has proposed major social and training investments to stimulate the economy

It says this is "the only way of reversing the catastrophic trends towards higher unemployment"

Last week's talks in the three industries were held to give employers and unions the chance to motivate proposals.

Numsa said in a statement yesterday if business and government continued to pursue present policies, these could lead only to a disastrous rise in unemployment which would make political or economic stability impossible

In its motivations, Numsa proposed urgent investment in electrification of all houses at affordable rates. It also proposed housing, education and training for all

"It is Numsa's view that ample capital is available in SA, a prob-

VERA VON LIERES

lem being that the capital is not being directed to productive investment"

Numsa said there were various mechanisms, including taxation, prescribed investments, negotiations and nationalisation to unlock this capital

There was also an urgent need for coherent policies for technology development, exploitation of markets, education, technical and commercial training, and other policy areas which were vital for the development of industrial capacity and employment

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Numsa said there was a need for a higher level of productivity in the manufacturing industry, particularly for capital productivity

Where labour productivity was concerned, the union believed this could be raised only "by an intensive and large investment in technical training"

Training programmes needed to

include paid training for all workers, formal education components, the recognition of prior skills gained through experience and the restructuring of production to use these greater number of workers

These policies would require business to accept major changes, including the need for state intervention in industrial strategy

Business also needed to accept that all industrial strategy, including technology policy, investments, and training strategies had to be negotiated with unions

Numsa is calling for a R2-an-hour across-the-board increase — or 25% — whichever is the greater.

It has proposed a minimum rate of R4,50 an hour in the motor industry. ~~355~~ ~~1407~~

Numsa also tabled important proposals for job security and training, including the establishment of jointly controlled job creation schemes and union rights to company information

Another demand was for the inclusion of non-scheduled workers under the Main Agreement



# Educationists look to technology

B/day 21/3/91  
THE crisis in SA's formal education system, coupled with the chronic lack of skills, has prompted both educationists and the business community to look to technology as an aid to help confront these issues

—And integrating audio and video technology with computers is a new trend in the information industry, says a BMI-T study, Computers in Education and Training. This integration represents an opportunity not only for hardware and software vendors but also for the entire electronics and telecommunications industries.

The study looks at the use of multimedia technology in education and training in SA

The objectives of the study were

- To quantify the market for various training and education technologies,
- To investigate industry and market forces and assess their impact on the future of the industry; and
- To highlight key supply and de-

mand trends

The study breaks the education and training market into three major sectors — formal, which involves government and private primary and secondary schools and tertiary institutions, non-formal which includes education and training conducted by private-sector organisations, human resources development, acquisition of basic and technical skills and supplementary education; and informal, which covers radio, television, video and audio tapes, films, books and magazines and over-the-counter courseware

## Effective

As the education crisis deepens, the study says, the non-formal and informal sectors will grow strongly

Political uncertainty has severely restricted the development of multimedia in the formal sector. There is broad agreement among educationists that no definite decisions will be

made on technology in education until a curriculum for the "new SA" has been formalised — and this will not happen until there has been a political settlement

That said, most education departments believe the use of computers as instructional media is effective, and more would be implemented in schools if funds were available

Interactive Computer-Based Training (CBT) is the largest market for multimedia applications, though the time and expense involved in developing courseware, particularly that tailored to individual companies, is seen as a drawback.

BMI-T expects the SA market for CBT to grow about 30% next year. Storing information on compact disc offers tremendous potential in space and cost savings

Hypermedia — the electronic integration of a variety of media — offers one of the most exciting prospects in the future, says the report

## HSRC argues case for widespread computer literacy

Bliss 22/4/91

JOB<sup>178</sup>S provided by the information technology sector will double by the year 2000 to 60 000 if SA accepts recommendations from the HSRC, says Prof Dewald Roode, head of Pretoria University's informatics department.

A recent study conducted by the HSRC suggested that every person at secondary school level should receive basic training in computer literacy.

In an interview published in Enterprise magazine, Roode says. "While

THEO RAWANA

current demand is greatest for experienced people the economy will continue to need a large number of people with a suitable level of computer literacy — but not necessarily any professional skills" (179R)

The HSRC study, of which Roode was chairman of the working committee, developed strategies to take SA into the 21st century as an infor-

mation technology-based economy. "Judging by prevailing trends, the information technology industry — currently providing work for about 30 000 people — will create opportunities for at least 60 000 by 2000."

He says this demand could easily be higher if the economic growth rate of the 1990s turns out to be higher than that of the 1980s. This implies that labour shortages in the information technology industry could become more problematic.



**T**HE phenomenon of too many matriculants with the wrong types of skills chasing too few jobs is explosive. The resulting frustration is the underlying cause of the black youth rebellion that has kept black townships on the boil for most of the last 15 years.

Because of the 1960s economic boom, when South African economic growth averaged 6% a year, all available white skills had been mopped up by about 1970. Reluctantly, government acknowledged that the country would have to rely more and more on black manpower to keep the economy growing.

But the cruel hand of fate then intervened. Just as the state started spending more on black secondary schooling, the rate of GDP growth slowed dramatically. The 6% average of the 1960s was halved in the 1970s, and halved again in the 1980s. The education system was churning out more and more matriculants but the economy needed fewer and fewer of them.

**P**art of the problem is that many of those who pass matric, sometimes in the face of heavy odds and huge parental sacrifice, do not have the skills that the economy requires. Mike Rosholt has pointed out that of every 1 000 children entering primary school, only 16 obtain tertiary qualifications in science, technology or commerce.

John Maree pointed out a year ago that the "mismatch between the output of the education system and the skills required by the market-place" meant in 1988 no fewer than 80 000 matriculants were unemployed while economic growth was hampered by a shortage of skilled people. Daily we hear calls for more and more money to be spent on education, which is already consuming 20% of the budget and more than 6% of GDP. Yet I think that Jaap Meijer of the South African Reserve Bank raised a valid point a few weeks ago when he said "It's all very well to spend 6% of GDP on education, but what about the mismatch between

# SA needs to get its educational priorities in Order

As Vozny 25/4/91

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JOHN KANE-BERMAN

the qualifications people are getting and what the economy needs?"

State expenditure on black education has increased by no less than 12 500% in the last 20 years in nominal terms, and expenditure on all education by more than 4 000%. But is SA getting adequate returns for this investment, or are we merely consolidating the foundations of instability as the education/employment gap continues to widen?

Trying to make something grow in the wasteland created by Verwoerd is difficult enough. It is necessary not only to eliminate racial distortions and injustices, however, but also to correct the academic bias of our education system. One of our dozen or so education ministers noted some years ago that only 10% of SA's manpower was being trained in a technical field while the figure should be closer to 75%.

West Germany has four students in technicals for every one in universities. In SA the position is almost exactly the reverse. In 1989 we had 301 000 students in universities and only 80 000 in technicals. Among white, coloured and Indian students the university/technical ratio was around 3:1. Among blacks it was 9:1.

The 9:1 ratio among blacks is mainly a legacy of apartheid in one form or another. Although apartheid in universities began to break down

10 years ago, the desegregation of white technicals is much more recent. Apartheid has numerous other legacies. One of them is a nationwide black classroom shortage of 47 537, 91% of it in the homelands. About 20-million South Africans do not have electricity in their homes, and in rural areas up to 80% of households do not have easy access to drinking water. To deal with these problems you need plenty of engineers and other technical people.

**T**here is much talk about income redistribution in SA, a process that is already under way through the successful efforts of black trade unions and via the Budget. Technical education will enable more black people to perform economically important jobs. However, the debate about redistribution is too narrow. One of the crucial types of redistribution that we need is that of educational resources from academic to technical.

Remedying the defects in SA's education system may also include pushing up the salaries of teachers in short supply, such as maths and science teachers. This may sound like heresy to some ears, but it is quite logical in economics that when

something is in short supply the price goes up.

There is no greater challenge facing SA than to increase the rate of economic growth. About 1 000 people are joining the labour market each day, but only 125 of them are getting full-time jobs in the formal sector of the economy. Unemployment is reaching crisis proportions, if it has not done so already. Yet the ability of the economy to grow faster is inhibited by the shortage of skills.

A recent report of the National Manpower Commission (NMC) points to the increasing imbalance between the over-supply of unskilled workers and excess demand for skilled workers. The report notes also that there has been a sharp increase in demand for skilled workers even during the last decade of low economic growth. It adds that there are now critical shortages, not only of apprentices, foremen and production supervisors, but also of computer operators, bookkeepers, technicians and engineers — demand for which will grow rapidly.

Fortunately, according to the commission, more black students are showing interest in careers related to technology. However, it warns, the desired ratio of five technician students to one university student is nowhere near being achieved. There is also still a disturbing trend that

most degrees and diplomas are being awarded in social science and education. "The urgent need for engineers and scientists is not being addressed properly by tertiary training institutions," the NMC says.

Most South Africans are no doubt very pleased that international economic sanctions are being eroded. However, instability and uncertainty about future economic policy combine to ensure that the foreign capital we need to help finance growth will not come rushing back in. We need lots of it. This economy must grow at between 5% and 6% a year to provide enough jobs, and half of that growth rate will have to be financed by inflows of foreign capital.

One of the ways of pushing up our growth rate is to become a much bigger exporting nation. New markets for our exports will not open up automatically. We have to fight for them against the disadvantages of rising production costs, limited economies of scale, and protectionist pressures abroad — not to mention competitors.

**F**or too long SA has been complacent about the capacity of gold to come to the rescue of our balance of payments. But our future lies not with the hope that the gold price will jump back to \$850 an ounce. It lies rather with success in all kinds of other exports, including exports of beneficiated minerals.

SA sells raw minerals abroad to produce many millions of rands in income. Yet, as a CSIR official pointed out some time ago, we then spent even "more millions in buying finished goods or processed materials made from the very same raw materials after someone else had benefited them."

He calculated that SA was earning R178 a ton of chrome exported in its raw state, but that if it were processed and exported as stainless steel we would earn R25 000 for that same ton of chrome. To beneficiate minerals we need many more scientists, technologists and engineers.

□ This is an extract of a speech delivered yesterday by SA Institute of Race Relations director Kane-Berman to a Protec function.



# Learned skills must have business value

8/10/91  
MANY organisations have set up open learning centres, walk-in facilities where people can get training

Where the use of technology based training (TBT) is established, organisations see that TBT cuts training costs and they can measure performance

Applied Learning's Norman Auerbach says much has been written on the opportunities and challenges

of the '90s  
Trainers must examine their priorities and concentrate on skills which add value in business terms

By using TBT to deliver and measure training the machine delivers the training and captures results on performance gains

"Many organisations find their budgets trimmed

"By using the learning centre to complement and

enhance other training methods, they can provide more mission critical training at a lower unit cost"

He says objective and realistic measures can be built into TBT courseware

"Students' performance gains can be monitored

"Progress through the training can be evaluated and the results measured because each move can be recorded in the computer-managed learning environ-

ment"  
179A  
In recent years, IT has transformed the way organisations do business

Information is now seen as a key resource and as the networked organisation becomes a reality, new ways of managing training are emerging

"Organisations well along the learning centre path are networking their workstations, and using a systems-managed approach for their training

"By linking students' performance results into the organisation's information system, training can be tied to many functions of the organisation

"For instance, the individual's skills profile can be updated

"This in turn may update the human resource plan, the succession plan and trigger a report to the line manager to initiate tutoring or counselling"

## Vital to develop proper culture

8/10/91  
ORGANISATIONS which develop a "training culture" are likely to benefit most from their investments in technology

Joffe Johannesburg training manager Liz Horner says the success of a computer training programme depends on the method implemented and support from top management

"Many South African organisations tend to regard training as a luxury

"When budgets are curtailed, it's the training budget which, along with the advertising budget, is first

to be cut  
"This is shortsighted"

Horner says computer training on an ad hoc basis, although better than no training, is also not cost-effective

"It can lead to uneven skills levels in companies, particularly at branch level

"This can be negative for productivity"

She says where computer training has become part of an organisations' culture, the level of computer skills throughout the company is high.

"Most people from mid-

179A  
dle management up steer away from computer training and among a large proportion of business executives, computer phobia has barely diminished over the years

"Computers are a necessity, but being able to use them to full potential is another"

In Japan, promotion and perks are usually linked to training

Successful completion of training courses is a prerequisite for advancement

"In SA, however, training is often confined to lower-level employees"



## The demand will be for more personnel

JUDGING by prevailing trends, the IT industry, which provides work for about 30 000 people, will create jobs for at least 60 000 by the year 2000.

Pretoria University's department of informatics head Prof Dewald Roode, who is also MD of Pretoria-based information management consultants Inbekon, says this demand could be higher if SA's economic growth in the '90s is higher than in the '80s.

"The influence of IT and the computer implies more than just a greater demand for computer personnel.

"While current demand is highest for experienced people, the economy will continue to need people with a suitable level of computer literacy — but not necessarily any professional skills."

A recent study by the Human Sciences Research Council (HSRC) for the National Training Board focused on this problem and developed strategies to take SA into the 21st century as an IT based economy.

### BIPAM 20/6/91 Consequences 179A

Prof Roode, who acted as chairman of the HSRC working committee, says the strategy being proposed will have far-reaching consequences for training and education in SA.

"We will have to tackle the problems of literacy and computer literacy simultaneously — neither can be left aside to address when the other is solved," he says.

If the HSRC investigation recommendations are accepted, all people at the secondary school level will receive a basic training in computer literacy, preparing them to enter an economy which will have to use IT to stay competitive in the world market.

High technology, especially computer or IT, has often been viewed as counter-productive in an economy where creating jobs is important.

Prof Roode says this view is off the mark.

"Although computerisation may affect the immediate jobs of people where computerisation takes place, the net result of any computerisation is often the creation of more jobs."

## A chance for Third World countries

IT'S WIDELY held that the force behind economic growth is increased national productivity

It's also been shown that such productivity increases are affected by investment in, and successful adoption of modern technological methods in all segments of an economy, says Punch Line Columbia Training GM Jacqui Kabatznik.

Third World countries have battled for the growth found in developed countries, but she says changes have come with the know-

ledge revolution and the advent of the PC.

"Successful use of computer technology and new technological infrastructure can instantly place previously backward countries at the forefront of economic activities

"There are huge installations set up to process paperwork, transactions and other functions of the service based sectors

"Many organisations are moving these processing operations out of metropolitan areas into areas

where labour is less expensive, yet educationally on a par with urban workforces

"This is one area of opportunity for less developed nations.

### Allows

"Communications technology allows these operations to take place anywhere in the world.

"There is thus no reason why less developed countries can't attract a share of this market," she says.

But for Third World

countries to take advantage of the computer revolution, the knowledge and education component of the transfer of technology must take centre stage

"All areas of computer literacy must be emphasised — from rudimentary keyboard skills to applications training and sophisticated programming

"This is a new educational challenge

"The developing nations have a rare opportunity to compete on a level playing field."



# Technologists are faced with a bleak future

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Reports by  
**MELANIE SERGEANT**

**INFORMATION** technologists in the computer industry may face a hazardous future

Many "whizz kids" of the '70s and '80s are finding themselves on the shelf by the age of 40 because of short-sightedness, lack of personal planning and a fixation on personal benefit factors

Bryan Hattingh Key People MD Bryan Hattingh says such people are joining the ranks of the unemployed every day

He says the industry is now a buyer's market and experiencing a long-overdue maturing process in which companies are questioning their recruitment policies, suppliers, internal management structures and becoming more stringent about who they employ — and why

Communicate Personnel consultant Charlie Viljoen says SA's computer staff

are in a difficult situation.

"The DP industry has seen a drive towards state-of-the-art technology and increased competitiveness on the international front

"Being on a par with overseas technology has demanded specific skills

This need has become prevalent this year, with a tighter economy and smaller budgets.

"Companies are desperate for certain skills which can take months of advertising and recruiting to find.

"With smaller budgets they are unable to justify training and often do without until the right person is found."

But it's been found skills required by the market place — such as in fourth and fifth generation languages, Unix and RPG

III/AS 400 — among others, can still command good salaries

She says for skills in areas like Cobol, salary increases have on average been slow

"It's the market demand for a skill that determines the increase in salaries commanded and offered.

"However salary increases over the last two years have diminished

"There has been an increase in the last six months, and this is expected to improve in the next six months," she says.

Large Scale Systems marketing director Dave Sullivan says although top-class computer professionals are always in demand, there's been a reduction in the need for middle-of-the-road skills

"This trend is evident in the high incidence of retrenchments in the computer industry"



**BRYAN HATTINGH**

The trend is partly due to consolidation among large users, which achieves savings in software licences and staff.

For this reason it's become essential for computer staff to have in-depth knowledge in vertical niche sectors, whether CICS, MVS, networking or Unix.

He says another facet of the trend towards high-level skills is the use of packaged software

"Users have become self-sufficient with the availability of powerful development tools and low-level programmers aren't required to the same extent as in the past," he says

## Govt to aid private sector research

GOVERNMENT is to implement a support programme for private sector research and development

Yesterday Trade, Industry and Tourism Minister Org Marais said the programme would fund part of a research project and would create better links between the private sector and research infrastructure.

His department would submit details of the programme to Cabinet

The scheme would attempt to improve industries' growth potential through specific technology programmes aimed at future growth markets This in turn would assist in

the diffusion of technological innovation in secondary industry.

Active support for research and technology development in the private sector was preferred to investment allowances and subsidies on exports It could take the form of a tax incentive or a partial subsidy

Companies qualifying for the programme would have to have track records in technology development A special programme to stimulate technology development in smaller firms was also being considered

blom 26/6/91 179A  
MARC HASENFUSS



## Computer illiterates

Business Day Reporter

THE present generation of senior executives in SA is not nearly sufficiently computer literate, which could have a significant bearing on their ability to lead their businesses through the tough '90s.

A survey in this week's Computer Mail, a supplement to the Financial Mail, reveals that only 50% of senior executives in SA's Top 100 companies have a personal computer, a work station or a computer terminal on their desk. *BID 26/6/91*

This implies that they cannot access critical business information when they need it, and have to rely on specialists within the organisation to get it for them.

In order to gain a competitive advantage, businesses should not only automate more information and analyse it faster but evaluate it in much finer detail and manage it as an asset.

Computer Mail has the inside story.

# ICI research strategy waits on Hanson axe

Star 1/7/91

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How does a company, or an industry, get value for money from its spending on research and development?

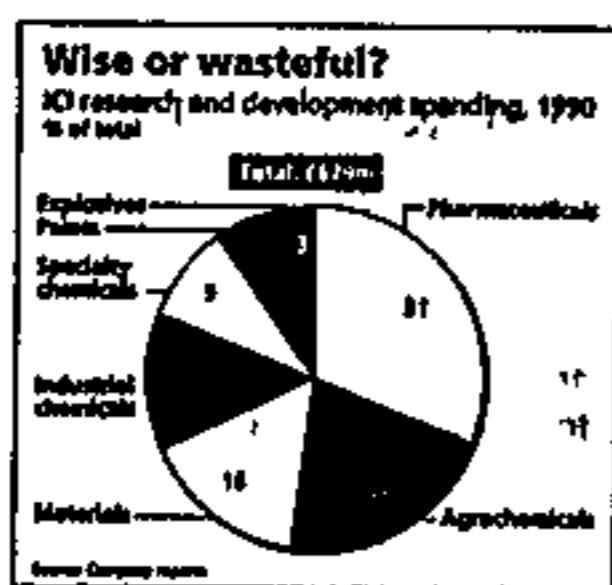
The question is unusually topical in Britain just now. Bid or no bid, ICI is hurriedly drawing up its defence plan to fend off Hanson, which purchased a 2.8 percent stake in the company, on May 14th. The core of ICI's defence is that, as a research-intensive company, it could flounder in the hands of a predator that caters to the short-term interests of the stock-market and eschews research. Look, says ICI, we spent \$679m (\$1.2 billion) on R & D in 1990, on sales of £12.9 billion. Hanson coughed up a paltry £34m on sales of £7.2 billion. But is ICI getting a decent return on its R & D investment?

Hanson thinks of R & D as just another business expenditure. The size of a firm's R & D budget, it says, does not guarantee business success. Scientists, like marketing men, should be called upon to justify what they spend. Such talk has appalled ICI and the rest of the chemicals industry.

The world's top chemicals firms spend an average of around 5 percent of their turnover on R & D, which does not seem prodigal when compared with the 7-8 percent average for electronics companies. But averages are misleading. Spending by individual chemical businesses varies widely. Plastics and their feedstocks are capital-intensive; they involve little R & D investment relative to their vast turnover. Value-added drugs or farm chemicals, which have a far smaller turnover, receive much more. In 1990 only 2 percent of ICI's industrial-chemicals turnover was spent on R & D; for pharmaceuticals the proportion was 15 percent.

At one time chemists would invent simply by tinkering with molecules in the hope of a breakthrough. The approach used to work well, producing nylon, polyethylene and other useful synthetic materials. But by the 1960s the productivity of such haphazard research was beginning to flag.

These days chemical companies reckon they run a tighter research ship. Slimmer research outfits tailor inventions to customer needs; research programmes are driven by the market. In 1981 ICI



disbanded its corporate research laboratory, decentralising responsibility for R & D to the bosses of each of its business units. The research plans of each business are then put to ICI's board.

Chemicals companies still fret, however, that by being too commercially minded they may stifle the new ideas on which their future success depends. As a result, companies are willing to accept waste in research — and that is why, they say, shareholders' short-term interests can sometimes conflict with long-term research aims. Some of this spending, however, is hard to justify.

ICI has long been admired for its skills in process engineering. According to Peter Doyle, ICI's research director and a board member, one of the most recent successes in the area is in the making of ammonia, a fertiliser feedstock. ICI's research boffins discovered a way to reduce by one-third the size of their ammonia-making facilities, a move that greatly increased efficiency. A big R & D success, says ICI — in 1989 it built two plants based on the new technology.

Yet all this investment looks odd. Since the mid-1980s ICI's fertiliser business has been struggling. Earlier this year the company announced the business's closure; the two ammonia plants are up for sale. Few licences for the technology have been sold. The cash poured into R & D looks wasted.

In 1985 ICI paid \$750 m for the chemical interests of Beatrice, mostly to get hold of its advanced-materials business. Shortly afterwards, cuts in defence spending forced the aerospace industry to renege. Competition for the few aerospace contracts was fierce because many of ICI's rivals had also joined the advanced-materials bandwagon. In 1990 ICI's advanced-materials sales reached around \$500 m, but the firm is losing pots of money. Meanwhile 16 percent of ICI's R & D budget continues to be poured into its materials business. Yet under the \$300 m reor-

ganisation plan ICI announced last February, advanced materials could be sold.

The trouble is partly that ICI, along with other

chemicals firms, lacks an effective system to encourage researchers and marketing people to talk to each other. Hanson smugly says that one of the first things it did when it bought Ever Ready, a battery maker, was to sell the main research centre, and put the remaining scientists nearer the marketers. In ICI, research and marketing men meet, mostly in corridors.

Other areas of research could also benefit from Hanson's touch. Pharmaceuticals absorbs by far the biggest chunk — 31 percent — of ICI's R & D budget (see chart). But over two-thirds of that is spent not on innovation but on routine clinical testing. ICI, along with the rest of the drugs industry, is now trying to find ways to cut its clinical costs.

A sizeable part of ICI's remaining R & D budget goes towards supporting hundreds of biotechnologists who, the company says, provide all the scientific skills needed to innovate yet much of this know-how is available in the biotechnology boutiques that offer their services to the pharmaceutical industry. One way to make corporate R & D departments more efficient would be to make them compete for company research contracts with such outside specialists. So far, ICI and other chemical companies have been reluctant to do this.

Mr Doyle admits that, despite ten to 15 years of endeavour, ICI pharmaceuticals has not come up with the novel products it needs. ICI's diabetic drug Statil, for instance, had to be dropped at the 11th hour because clinical trials showed it to be better than a placebo. Such disasters are commonplace in the industry. But ICI now reckons that, like America's Dow and France's Rhône-Poulenc, it might have to find a partner to ensure continued success.

Nobody yet knows Lord Hanson's precise plans for ICI. But it would be foolish to disqualify him simply because of his lack of research experience. Smith Kline Beecham, one of Britain's biggest drugs companies, is headed by an ex-executive of General Foods, Bob Bauman. — The Economist.



# Government to support technology, says Marais

8/10/89 4/7 91

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Reports by  
**MELANIE SERGEANT**

TRADE and Industry Minister Org Marais told the recent Technology Mart conference in Midrand that government considered technology a key element in improving SA industry's competitiveness, and enhancing economic growth.

He said developing the industrial sector and creating competitive advantages were vital if SA was to make inroads into highly competitive world markets and create wealth for its people

But official statistics were not encouraging, he said

"The index for the volume of production of manufactured goods showed only a slight increase from 108,7 to 109,1 between 1982 and 1989. In 1990 this figure was 2,3% lower than it was in 1989."

An even more alarming tendency was evident in the balance of payments, because there was relatively no growth in the volume of manufactured product exports

"The most intensive form of competition takes place in international markets. Tariff protection shields local undertakings from the beneficial effect of international competition," he said.

"Government has requested the Industrial Development Corporation to investigate and advise it on an appropriate tariff protection policy"

He said the significance of technology development for economic growth and prosperity could not be overemphasised.

"Technology development leads to new products and processes. Improved technology can increase added value with accompanying job creation, and lead to improvement in the balance of payments."

On the subject of beneficiation, he said it appeared that the risk factor in respect of profits was too high.

"This factor can be lowered by improving the comparative advantage in producing downstream products by means of technological improvements, tax benefits and subsidies"

Marais said that in the most successful countries governments gave active support to research and technology development in the private sector, which was preferable to investment allowances and subsidies on exports

He spoke of levelling the playing field for SA's private sector with that of the rest of the world.

"But tax incentives have the disadvantage that cost/benefits are not always measurable, and they distort the tax structure."

He said a policy document had been prepared by his department, and was being considered by government.

"What I have in mind is a programme to partially support research projects proposed by the private sector which would be executed by research organisations"

This programme would fund part of the research and create better links between the private sector and SA's research infrastructure.

Other major recommendations in the policy document are:

- More active application of public sector buying power to accentuate growth through new technology and new products,
- Improving growth potential in industry through specific technology programmes aimed at future growth markets, and
- Assisting in the diffusion in technological innovation in secondary industry - "secondary innovation".

# IS staff still earn top wages

Argus 6/7/91

**ANDREW MORRIS**

DESPITE the economic downturn some specialist information systems (IS) staff still command premium salaries. This is one of the findings of the Computer Users Council Salary Survey.

Network support and software positions receive between six and 16 percent above the average IS compensation levels.

Market sector is a major determinant of pay with the automotive industry offering the best entry level packages, financial companies offering the best packages to senior technical staff and the oil industry paying the top price for management staff.

Different practices were identified for different levels with managers in the 35 to 40 age group earning more than those over 40, but older entrants to the industry earning more than younger entrants.

Factors determining the compensation packages ranked according to significance are as follows: size, market sector, age, skill level, technology, management structure, geography and sex.

The extent to which these factors are influenced by the economy, technological developments and the maturity of the computer industry will only become clear after further surveys.

Compensation practices are  
This survey was conducted for  
the CUC by Hay Management  
Consultants



# Engineering a richer future



1991



ster 9/17/91.

**WHEN THE focus turns** to the economic scenario as South Africa pushes towards a new post-apartheid era, Dr Roy Marcus, president of the South African Engineering Association, jabs an index finger at a set of facts and figures always at hand

At the top of the list are estimates that no fewer than 17.5 million South Africans — 47 percent of the population — live in households that struggle to survive on as little as R695 a month

The cost of rescue packages, to lift them no higher than the line drawn to mark what is considered a minimum living level by normal standards, would run to a staggering R15 000 million.

A dilemma beyond solution? It begins to look that way as the finger next follows the dismal record of economic performance in recent years, too feeble even to keep pace with the growth in population.

Dr Marcus, former dean of the faculty of engineering at the University of the Witwatersrand and now managing direc-

**Engineering boffins believe South Africa faces the crossroads of its economic future: sliding in status to yet another African country in economic shambles, or turning to technology.**  
**MICHAEL CHESTER reports**

tor of the Synergy Business Consultancy, also underlines the chronic shortage of skilled engineers needed to reune the economic motors and give them more power

Frustration makes with anger when a new batch of statistics highlights the scarcity of engineering and science students among the 267 000 undergraduates flowing through a national network of 21 universities, compared with the hordes in pursuit of BA degrees with little direct relevance to manpower needs

The frustration deepens when he points out that the number of technicians trails far behind at only 13, with a combined enrol-

ment of only 60 000 students

"That's where South Africa's economic problems come to roost," argues Dr Marcus. "We need a radical rethink about our education and manpower priorities, and learn that much more emphasis must be devoted to technology"

"We'll never find the economic thrust to tackle the future with any confidence until there has been a dramatic increase in the supply and status of skilled engineers"

"If there are any lingering doubts, all South Africa needs to do is examine the formula that created the economic miracles achieved by the new tigers in the Far East, Japan, Taiwan, Singapore, Hong Kong and South Korea

"All of them owe their success to the high priorities devoted to technology in their education systems

"South Africa, now at new crossroads, has an ideal chance to chart a course to follow their example in the search for new economic strategies. It could mean virtual economic suicide if we ignore the opportunity. "We can cut out the nonsense



Radically rethink priorities . . . urges Dr Roy Marcus

about South Africa not having the resources or the manpower to flex the sort of economic muscles that have been developed by countries in and around the Pacific Basin. Of course we do, if we apply our minds to it.

"With few natural resources of their own, most of them had little more than sheer determination to make full use of the tools of modern technology when they made an enigmatic debut on the stage of world

trade and rattled the complacency of global rivals on international markets

"Each of them pledged to deliver the goods at the right price, right quality and right time.

"Their industrial strategies are based on three elements production, more production and still more production. And that means more skilled engineers and better technology. "South Africa needs to study the simple lessons well

"And we can do without hang-ups about whether we have the potential talent to handle the exercise. Of course we do. That has been proved by the high technology developed at Sasol, Eskom, Armscor, in uranium enrichment and in the whole mining industry, where we lead the world."

Dr Marcus believes South Africa faces the blunt alternative of shipping into the status of yet another African country in an economic shambles — or pulling all the levers of technology to achieve the status of a winning nation.

The SA Engineering Association has pulled the first lever with the launch of what it calls TAP (Technology Awareness Programme). Its main objectives are

- Creation of a national technological culture.
- Promotion of technology as the platform for economic growth and national survival.
- Increasing Government awareness of the key role of technology.
- Gaining wider industrial support and recognition of the leverage effect of technology.

- Action to avert a crisis in engineering education at tertiary institutions
- Uplifting the perception of technology as a career opportunity
- Development of a strong professional status for engineers and scientists
- Establishment of a national technology think-tank

The programme has been reinforced by a special contest to find the Technology Top 100 firms showing flair in the business sector

The winners will be announced at the opening of the Trade and Industries Fair in Johannesburg next March

With luck, the association will also persuade the State President to name March 9 as Technology Day — and make it an annual event on the South African business calendar

"Back to our first concern about the number of South Africans living in absolute poverty. Do we really want that problem to stay unresolved? Or shall we all take the high road and generate a new confidence in society at all levels about the economic future?" □



# Reliance: SA firms need their systems

179A 180

Argus 13/7/91

**ANDREW MORRIS**

Computer Correspondent

**FORTY** percent of major South African companies could be put out of business by the loss of computing facilities.

About a quarter of local firms believe they could not survive for more than one day if their computers were significantly impaired

Loss of computer facilities for one working week will significantly harm more than two-thirds of firms and few could survive after 10 days

This is the finding of a recent national survey of computer disaster recovery planning undertaken by the University of Cape Town Graduate School of Business

This study shows an improvement since the previous one conducted five years ago by Gugyeras Gombay (1985), but highlights a continuing threat to companies.

Most firms are significantly more dependent upon their computer facilities than previous research has shown but the majority of firms remain inadequately protected. Strategies range from manual backup to contracted "hot site" facilities.

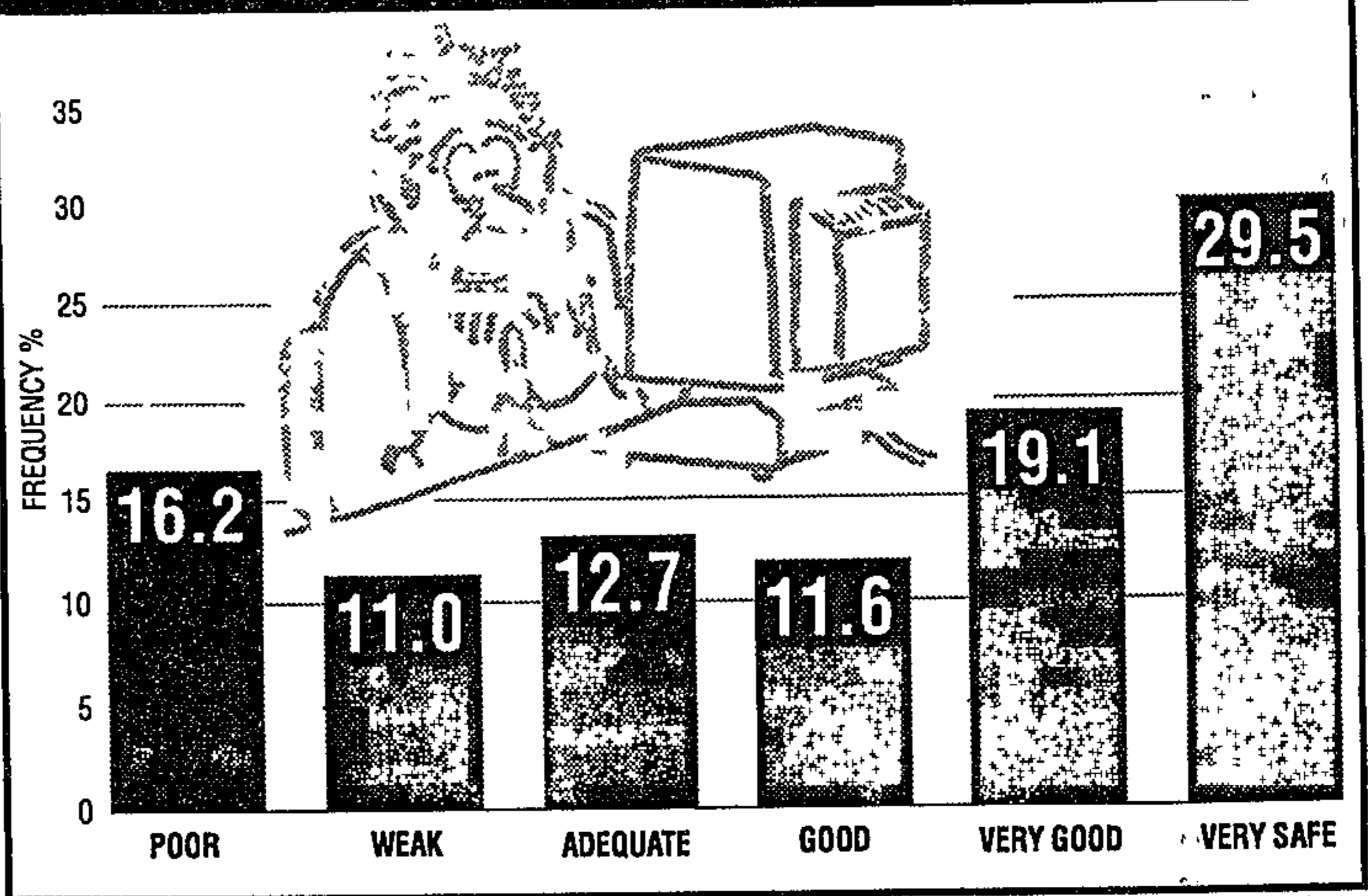
Disaster Recovery Planning (DRP) is most often the responsibility of the information systems management and the survey indicates that these plans may be poorly defined and far from fully implemented

As reliance on computer facilities increases DRP should be seen not as a way of keeping the computer department but rather as a way of keeping the company running. The declaration of a disaster is a business decision and mandate for DRP should come from the chief executive

Having a plan is one thing, but only 18 percent of South African firms have actually tested these plans. Considering the risks involved, the reluctance to fully test preparedness is understandable, but may be creating a dangerous sense of false security

A recent study in America showed that 75 percent of American firms declaring disasters could have avoided them by having disaster avoid-

## A measure of disaster recovery planning effectiveness



Graph: BOB GRIERSON, The Argus

ance strategies in place. These strategies include fortifying computer facilities, and installing alarms, smoke detectors and water pumps

Even employment practices need to be addressed to screen out potentially irresponsible employees as human error is still a significant contributor in disaster situations.

Recovery from a disaster is also a significant issue and the study reveals that 23 percent of local firms believe they could not survive for more than one day if their computer facilities were significantly impaired

This is considerably higher than the previous study. Loss of computer facilities for one working week will significantly harm more than two thirds of firms and few could survive after 10 days

There is also a significant shift from manual recovery to contracting of outside agencies providing hot site facilities, indicating a marked increase in the perceptions of risk

Hot site facilities are fully operational computer centres in a state of readiness in the event of a disaster in a client's facility. Some of the larger companies maintain their own remote sites for their own use

and for selected partners.

The study uses an "index of preparedness" developed from the previous study which gives a measure of the respondent's ability to withstand loss of computer facilities in relation to their needs. It is necessary to understand the significance of the facility to the business since DRP costs must be controlled. If a firm can successfully continue operation using manual recording this may be acceptable, but for large institutions requiring immediate turnaround with large volumes of transactions this would be totally inadequate

According to this index

**POOR.** The organisation is highly vulnerable to a loss of its information systems and a disaster could jeopardise its survival

**WEAK:** The organisation is vulnerable to a computer disaster which would result in a conspicuous interruption of its processing capabilities. The organisation's operation could be adversely affected to the extent that it might lose business

**ADEQUATE:** An organisation in this category could recover from the loss of its computer facilities at some cost and

after some public exposure

**GOOD:** The organisation is serious about preparing for a computer disaster which should only have a passing effect on the continuity of its business operations.

**VERY GOOD:** Within this category organisations are prepared for the worst that could happen and a disaster should have no material effect on the business side of their operation.

**VERY SAFE:** Organisations in this category are playing it safe by making sure they can recover from a disaster effectively and swiftly even if they do not have immediate business exposure to a loss of computer facilities

It is not all bad news since more than 50 percent of the firms surveyed can be construed as having very good or very safe DRP strategies in place

**Report:** Planning for the loss of computer facilities in South African companies, trends over the last five years by Dr Jon Miller and Michael Wenhham, May 1991, UCT Graduate School of Business.



# ANC warns of R&D laws

B/day 16/7/91

(1794) (1/2)

SHARON WOOD

REGULATIONS should be implemented compelling private companies to allocate significant percentages of their turnovers or profits to research and development (R & D), says ANC economic spokesman Tito Mboweni.

It is "scandalous" that SA companies spend so little on R & D, he says

If SA is to emerge as a serious manufacturing exporter, attention will have to be focused on R & D, he adds. The private sector will have to accept that there will be government intervention.

"This is an issue for debate . . . but the private sector has shown its inability to invest voluntarily in R & D."

CSIR Research, Development and Implementation Group executive Brian Clark describes SA as "an exceptionally modest investor in R & D"

Total R & D expenditure in SA amounts to between 0,7% and 0,8% of GDP. Based on 1990 GDP, this suggests annual R & D expenditure of about R1bn. Most major industrial countries spend more than 3%

"This will have to be turned around if SA is to become a competitive exporter in world markets", says Clark.

But government should not force the

private sector to invest in R & D. Instead it should make it easier for the private sector to spend on R & D through tax incentives and grants, he says

These incentives have been implemented in industrial countries and the SA government must level the playing fields for local companies.

Clark adds private sector exposure to competition will make it essential to invest in R & D.

Government is in the process of developing a programme to promote R & D in the private sector. Trade and Industry Minister Org Marais recently said government would implement a support programme for private sector research

The programme would concentrate on tax incentives and partial subsidies to companies which had proven technology advancement track-records.

Rand Merchant Bank economist Rudolf Gouws says enforced private sector R & D expenditure would not necessarily promote useful and productive research.

R & D should be left to market forces because the market would penalise companies if they did not invest in it.



● MBOWENI

# New technology 'not advisable'

SHARON WOOD

SA SHOULD concentrate on improving technology developed overseas rather than on developing new technology at a grass-roots level, Sacob Technology Committee chairman and Salt Gitter MD Ted Adlard said yesterday.

Adlard was responding to recent ANC criticism of the level of research and development (R & D) in SA.

It would be unrealistic to compare SA's levels with the R & D levels in the industrialised nations, he said.

"SA does not have the skilled manpower or the resources to compete with countries like the US" Instead SA should aim to attract more foreign investment and benefit from existing technology, he said.

Anglo American public affairs consultant Michael Spicer said comparing SA's

## GROSS DOMESTIC EXPENDITURE ON R & D

	% of GDP	% Financed by	
		Government	Industry
SA	0,96	57,7	42,3
Australia	1,13	64,7	32,1
Ireland	0,77*	48,5*	43,3*
Japan	2,81	21,0	68,9
Portugal	0,40*	62,1*	30,8*
Spain	0,53	45,2	49,6
UK	2,32	43,4	46,1
US	2,77	50,3	47,9
West Germany	2,67	36,7	61,8
*1984			

position with the richest and most sophisticated economies was inappropriate.

Although SA had a lower per capita GDP than the countries in the table, SA allocated a higher proportion of GDP than Portugal, Ireland and Spain. It also did not spend much less than Australia.

"Nor is the private sector's role in the national research effort to be found lacking," he said. At 40% of R & D spending it was in line with international norms.

Sacob economist Ben van Rensburg said expenditure was low compared with many countries. SA would have to "step it up".

But in response to ANC spokesman Tito Mboweni's suggestion that government impose regulations on private sector expenditure, he said "Sacob does not believe in the whip but in the carrot approach".

He said if the private sector did not see the benefit or necessity of R & D, "they will not spend".

SA needed to develop a technology strategy policy which would give incentives to the private sector to spend on R & D.

The private sector and the Department of Trade and Industry were already working on a technology policy for SA.



## Paperless trading seen as a toy

AWARENESS of electronic data interchange (EDI), the electronic transmission of paperwork such as invoices and orders, is emerging rapidly in SA

However, a new study from BMI Technology has found that awareness of "paperless trading" technology is converting into practice very slowly

This, and other research, shows that although EDI is vital if SA is to continue trading with major overseas countries, many top executives do not realise its importance and see it as nothing more than a new "technology toy".

Asked to pinpoint IT investment areas, the study found that companies have spent little on EDI in the past two years, but over the next two years and beyond they expect to spend more on EDI than on wide area networks, but less on this than, for example, on executive information systems

Major areas for spending are on-line transaction processing and local area networks.

Of 344 respondents, only 18% said EDI was critical to their long-term development, while 32% said it was important now and 50% said it was not important

Asked about the number of active terminals they expected to have on their EDI networks, 34% of 134 respondents said they would have between one and five terminals, while 5% said they would have more than 250. A substantial 71% of companies have not yet done EDI studies.

During this year, 13% plan to implement EDI while 41% say they will implement it after 1991 and 38% say they are not planning implementation

(179A)

Keen

BIPan 18/7/91

BMI's Alan Paul says in the sample population, EDI awareness of technical matters is good, but there is a lack of knowledge on how EDI can assist business operations

Data processing (DP) and information systems (IS) managers are keen on it, but the top executives and managers do not appreciate the change in business practice which EDI will herald.

"The emphasis now must be to sell EDI to business executives so they see the importance of converting to this new mode of conducting business transactions"

## Electronics the key to growth <sup>(179A)</sup> paper

THE Electronic Industries Federation's position paper has been released. It says the industry is a key factor in SA's domestic economic growth and international competitiveness. For this reason, the industry is determining its strategy in the light of economic, social and political changes <sup>Business Day 18/7/91</sup>

"The economics of developed and developing countries are dependent to an ever-increasing extent on the promotion and utilisation of modern technologies such as automation, computing power, informa-

tion processing and communications"

In dollar terms, SA ranks 22nd in the world as a consumer of electronic goods, but ranks as the ninth largest importer of electronic goods. "This is an opportunity to redress," the paper says

The document pinpoints seven major factors for special attention. They include rationalisation, the cost of labour, capital and intermediate goods, company tax, appropriate protection and incentives, and measures against dumping by overseas competitors



# Business Day SURVEY

A recent study shows government and the private sector will have to spend more on education and training during the next decade if SA's growth potential is to be realised. About R25bn a year is currently spent on formal, informal and in-service training. **DIANNA GAMES** reports.

## Keeping pace with the market

COMPUTER training in corporate South Africa has seen a change in the demand for conventional computer appreciation, says Punchline Columbia Training GM Jacqui Kabatznik.

Kabatznik says the only way to bridge the gap in educational levels in SA is with technology. "Our objective is to make the transition from the classroom to the working environment non-existent."

"We have to warm up people in the township to computers by having them learn them in their own community. We need to show them technology is not something separate."

The division is involved in a pilot project in Kattahong supported by Coca Cola, which is the germ of technological advancement in a community which had had no exposure to it.

Kabatznik says the Kattahong project has experienced problems such as violence, the destruction of school property (although the computers were not touched) and frequent power cuts.

As a result, only 40 people were trained last year instead of an expected 120.

Punchline Columbia Training (PLCT), the official training organisation for US firm Ashton Tate, has done similar work in Minabatho, has a project lined up in Transkei and is exploring possibilities in Botswana and Angola.

Kabatznik says computer appreciation has changed in the corporate market in the last six years.

Initially, participants were corporate directors and end-users, but companies are now sponsoring black education and are sending their black staff on computer literacy courses.

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## NOTICE 781 OF 1991

## DEPARTMENT OF MANPOWER

## NTB/HSRC INVESTIGATION INTO THE TRAINING OF COMPUTER EXPERTS AND COMPUTER LITERATES IN THE RSA

Comments are invited on the above mentioned investigation of the National Training Board and the Human Sciences Research Council into the training of computer experts and computer literates in the RSA. An Edition of the executive summary is included herewith.

Such comments should be lodged in writing with the Director-general Manpower, Private Bag X117, Pretoria, 0001, within 90 days of the date of publication of this notice. A copy of the comments should be directed to the Chairman, National Training Board at the same address.

**Notes:**

1. The full bilingual report is available from the Group Education (enquires Mrs I. de Villiers), Human Sciences Research Council, 134 Pretorius Street (Private Bag X41), Pretoria, 0001 [Tel. (012) 202-2595 or 202-9111], at R45 and the bilingual executive summary at R15 (GST included).

2. The corresponding number of the paragraph in the report to which the comment refers must be clearly indicated in each case.

**EXECUTIVE SUMMARY****1. INTRODUCTION****1.1 Statement of the problem and background**

For a considerable time the computer industry has experienced the problem of an imbalance between the demand for and availability of computer experts and computer literates. It assumed such proportions that the Commission for Administration requested the National Training Board (NTB) to conduct a comprehensive inquiry into this matter. In its turn the NTB approached the Human Sciences Research Council (HSRC) to act as research contractor in implementing the investigation.

A research proposal was submitted by the former Institute for Educational Research (now the Group Education) of the HSRC to conduct the investigation and a high-level work committee of experts from the computer environment in the public and private sectors was appointed to lead the investigation with Professor J. D. Roode from the Department of Informatics of the University of Pretoria as chairman.

A research team of six members under the guidance of the chairman of the work committee (who himself acted as a researcher) handled the ongoing research work associated to this investigation.

## KENNISGEWING 781 VAN 1991

## DEPARTEMENT VAN MANNEKRAG

## NOR-/RGN-ONDERSOEK NA DIE OPLEIDING VAN REKENAARKUNDIGES EN REKENAARGELETTERDES IN DIE RSA

Kommentaar word afgewag oor die bovermelde ondersoek van die Nasionale Opleidingsraad en die Raad vir Geesteswetenskaplike Navorsing na die opleiding van rekenaarkundiges en rekenaargeletterdes in die RSA. 'n Weergawe van die bestuursopsomming van die ondersoek word hierby ingesluit.

Sodanige kommentaar moet binne 90 dae na die datum van publikasie van hierdie kennisgewing skriftelik ingedien word by die Direkteur-generaal, Mannekrag, Privaatsak X117, Pretoria, 0001. 'n Afskrif van die kommentaar moet aan die Voorsitter, Nasionale Opleidingsraad by dieselfde posadres gerig word.

**Notas:**

1. Die volledige tweetalige verslag is beskikbaar by die Groep: Onderwys (navrae mev. I. de Villiers), Raad vir Geesteswetenskaplike Navorsing, Pretoriusstraat 134 (Privaatsak X41), Pretoria, 0001 [Tel. (012) 202-2595 of 202-9111], teen R45 die tweetalige bestuursopsomming teen R15 (AVB ingesluit).

2. Die nommer van die toepaslike paragraaf in die verslag waarop die kommentaar betrekking het, moet telkens duidelik aangedui word.

**BESTUURSOPSOMMING****1. INLEIDING****1.1 Agtergrond**

Die rekenaarbedryf ondervind 'n geruime tyd reeds die probleem van 'n wanbalans tussen die aanvraag na en aanbod van rekenaarkundiges en rekenaargeletterdes. Die probleem het sulke afmetings aangeneem dat die Kommissie vir Administrasie (KVA) die Nasionale Opleidingsraad (NOR) versoek het om 'n breë ondersoek in dié verband te loods. Op sy beurt het die NOR die Raad vir Geesteswetenskaplike Navorsing (RGN) genader om as navorsingskontraakteur die ondersoek uit te voer.

'n Navorsingsvoorstel van die eertydse Instituut vir Opvoedkundige Navorsing (tans die Groep. Onderwys) van die RGN is aanvaar om die ondersoek uit te voer en 'n werkkomitee van kundiges in die rekenaaromgewing uit die openbare en die privaatsektor is saamgestel om die ondersoek te lei. Prof. J. D. Roode van die Departement Informatika van die Universiteit van Pretoria is as voorsitter van die werkkomitee aangestel.

'n Navorsingspan van ses lede onder leiding van die voorsitter van die werkkomitee (wat self as navorser opgetree het) het die deurlopende navorsingswerk verbonde aan die ondersoek behartig.



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## 1.2 Assignment

The principal stated the main objective of the investigation as follows:

To increase the supply of computer experts and computer literates by giving attention to training, while bearing in mind educational policy

In addition the following supporting objectives of the investigation were set out

- To make proposals for promoting closer linkage between educational and training activities
- To involve (take into account) all facets of training
- To consider the financing of training
- To formulate recommendations with a view to a suitable policy and strategy for increasing the supply of computer experts and computer literates
- To set out short-, medium- and long-term objectives and to make proposals for implementation
- To inquire into the possibility of a training council for the computer industry

The work committee judged it could best discharge its task by considering its assignment as a mission of the investigation. This implied that a strategic approach to the assignment was needed, which would imply the following

- The use of a structured *modus operandi* to determine a strategy to support the mission
- The identification of plans of action necessary for the implementation and (on-going) adaptation of the strategy

It became apparent, however, that the mission could not be taken literally as set out above. In the first place, it might be important for short-term considerations to increase the supply of computer experts and literates on account of certain existing shortages, while in the long term it might be unacceptable to continue to increase the supply. It would be much more sensible that the supply should keep pace with demand: that it should not only continuously increase but at times, as necessary, also decrease.

It is obvious that here there can be no question of a planned provision of manpower: the market forces in a free economy must be allowed to act in a self-regulatory manner. This does not detract, however, from the fact that certain strategies and supportive plans of action may be put into operation for the best utilization of the market forces. The strategy and plans that are later proposed in paragraphs 2 and 4 must throughout pass this test: that they do not interfere with the principles of a free economy and that they do indeed use the forces of the market correctly.

In the second place, the provision of high-level manpower such as computer experts is an integral and inseparable part of the total terrain covered by information technology (IT). It is already known fact that IT is an indispensable component of the modern economic society. The increasing development of this technology also means that it becomes ever more closely interwoven with all economic activities. It would be altogether short-sighted to suppose that in a country like South Africa this tendency will follow a course other than that in the more sophisticated countries of the First World

## 1.2 Opdrag

Die opdraggewer het die hoofdoel van die ondersoek soos volg gestel.

Om die aanbod van rekenaarkundiges en rekenaargeletterdes te verhoog deur, met inagneming van die onderwysbeleid, aan opleiding aandag te gee

Daarnaas is die volgende suboogmerke vir die ondersoek gestel:

- Om voorstelle ter bevordering van nouer skakeling tussen onderwys- en opleidingsaksies te maak
- Om alle fasette van opleiding te betrek
- Om die finansiering van opleiding in hierdie verband onder oë te neem
- Om aanbevelings met die oog op 'n toepaslike beleid en strategie vir die verhoging van die aanbod van rekenaarkundiges en rekenaargeletterdes te formuleer
- Om kort-, medium- en langtermyn doelwitte te formuleer en voorstelle vir implementering te maak
- Om ondersoek in te stel na die moontlikheid van 'n opleidingsraad vir die rekenaarbedryf

Die werkkomitee het geoordeel dat hy sy taak ten beste sou kon nakom deur die opdrag as 'n missie van die ondersoek te beskou. Dit beteken dat die opdrag dan uit 'n strategiese hoek benader moet word, wat die volgende inhoud

- Gebruik 'n gestruktureerde werkswyse om 'n strategie ter ondersteuning van die missie te bepaal
- Identifiseer die aksieplanne wat nodig is vir die implementering en (voortdurende) aanpassing van die strategie

Dit het egter geblyk dat die missie nie net so letterlik soos hierbo gestel, gebruik kon word nie. In die eerste plek kan dit weens korttermynoorwegings belangrik wees om die aanbod van rekenaarkundiges en rekenaargeletterdes te verhoog omdat daar nou sekere tekorte bestaan, maar oor die lang termyn kan dit onaanvaarbaar wees om voortdurend die aanbod te verhoog. Dit sou veel meer sinvol wees om te aanvaar dat die aanbod van rekenaarkundiges en rekenaargeletterdes met die conjunktuur tred moet hou—dit wil sê, nie slegs 'n voortdurende styging vertoon nie, maar ook soms, soos nodig, 'n verlaagde tempo.

Dit spreek ook vanself dat hier nie sprake kan wees van 'n beplande voorsiening van mannekrag nie—die markkragte binne 'n vrye ekonomie moet toegelaat word om selfregulerend op te tree. Dit neem egter nie weg nie dat sekere strategieë en ondersteunende aksieplanne in werking gestel kan word om die markkragte reg te benut. Die strategie en aksieplanne wat later in paragrawe 2 en 4 voorgestel word, is deurgaans daaraan getoets dat hulle nie die beginsels van 'n vrye ekonomie aantast nie, en inderdaad die markkragte reg benut.

In die tweede plek moet in gedagte gehou word dat wanneer van die voorsiening van hoëvlakmannekrag soos rekenaarkundiges gepraat word, dit onlosmaakbaar deel is van die totale terrein wat deur die inligtingstechnologie aangespreek word. Dit is reeds 'n bekende feit dat inligtingstechnologie 'n onontbeerlike komponent van die moderne ekonomiese samelewing is. Die toenemende ontwikkeling van inligtingstechnologie beteken ook dat dit steeds enger verweef raak met alle ekonomiese aktiwiteite. Dit sou totaal kortsigtig wees om aan te neem dat in 'n land soos Suid-Afrika hierdie tendens anders sal verloop as in die meer gesofistikeerde lande van die Eerste Wêreld.



179A Information technology should indeed be seen as a technology that promotes job creation. Although computerization in many instances means, in the short term, that machines take over certain business processes previously performed by people, experience has shown time and again that in the long term it creates new employment opportunities. A good illustration of this is provided by the sophisticated computer applications made by banks and other financial institutions. Computer and information technology is an inseparable component of these undertakings and has enabled them to render services which are an important support for the total economy. As a result the economy is in a position to maintain a level of activity which, without IT, would simply not be possible. This in turn means that certain other economic activities become possible.

A significant reason for the increased use of IT in South Africa, in step with other countries, is its trade partnership with those countries—which, especially in the New World order, can be expected to expand still further. To remain competitive South Africa must maintain the highest possible level of productivity and must purposefully optimize the cost-effectiveness of all economic activities. Furthermore, there are direct influences, for example, the growing utilization of electronic document interchange (EDI) which will certainly form the basis of future external and domestic trade.

This means that South Africa cannot decide in isolation that IT should play a subordinate role in our economy and that the emphasis should fall on direct job-creating endeavours. Naturally these should not be ignored, but it would be catastrophically short-sighted not to use to the utmost the job creation capacity of IT through the support it can lend to the economy as a whole.

If it is accepted that IT will play an increasingly important part in the South African economy, an inexorable consequence is the growing need for computer literacy of the population as a whole.

Information technology can also be an important aid in achieving general literacy—here indeed two birds can be killed with one stone. South Africa's challenge is to address the need for computer literacy while at the same time ensuring a sufficient level of ordinary literacy for her population.

There is at present in South Africa a considerable fluidity in educational policy: The work committee took note of the existing policy and recent developments and welcomes the recognition already given to the importance of the computer in education. Specific plans of action proposed by the work committee and which link up with these developments in educational policy are set out in paragraph 4.

Inligtingstegnologie moet inderdaad gesien word as 'n tegnologie wat werkskepping in die hand kan werk. Selfs al beteken baie rekenarseringsprosesse dat oor die kort termyn sekere besigheidsprosesse wat voorheen deur mense hanteer is, nou deur rekenars behartig word, het ondervinding telkens gewys dat oor die lang termyn juis daardeur nuwe werkgeleenthede ontstaan. 'n Goede illustrasie hiervan word gegee deur die gesofistikeerde rekenartoepassings by banke en ander finansiële instellings. Die rekenaar en inligtingstegnologie is onlosmaakbaar deel van hierdie ondernemings, en het hulle in staat gestel om dienste te lewer wat 'n belangrike ondersteuningskrag vir die totale ekonomie is. Daardeur word die ekonomie in staat gestel om 'n aktiwiteitsvlak te handhaaf wat sonder inligtingstegnologie net nie moontlik sou gewees het nie. Dit veroorsaak weer dat sekere ander ekonomiese aktiwiteite moontlik word.

'n Belangrike rede vir die toenemende gebruik en benutting van inligtingstegnologie, soos in ander lande, is die handelsvennootskap met sulke lande wat, veral in die nuwe wêreldorde, verwag kan word om steeds verder uit te kring. Aan die een kant moet Suid-Afrika, om kompetend te bly, die hoogs moontlike vlak van produktiwiteit handhaaf en die koste-effektiwiteit van alle ekonomiese aktiwiteite doelbewus probeer optimaliseer. Aan die ander kant is daar direkte invloede, byvoorbeeld, die toenemende gebruik van elektroniese dokumentwisseling ("electronic document interchange" of EDI) wat beslis die basis sal vorm vir toekomstige buitelandse en binnelandse handel.

Dit beteken dat Suid-Afrika nie isolasionisties kan besluit dat inligtingstegnologie 'n ondergeskikte rol in ons ekonomie moet speel nie, en dat die klem meer moet val op direkte werkskeppende pogings. Natuurlik behoort laasgenoemde nie agterwee te bly nie, maar dit sou katastrofale korsigtigheid wees om nie die werkskeppende vermoë van inligtingstegnologie, deur die ondersteuning wat dit aan die ekonomie in sy geheel kan verskaf, ten volle en tot die uiterste te benut nie.

Indien aanvaar word dat inligtingstegnologie 'n toenemende belangrike rol in die ekonomie van Suid-Afrika sal speel, dan volg daaruit onverbidlik 'n toenemende behoefte aan rekenargeletterdheid van die totale bevolking.

Inligtingstegnologie kan ook 'n belangrike hulpmiddel wees om algemene geletterdheid te verwerf, en twee vlieë kan hier inderdaag met een klap bygekome word. Die uitdaging vir Suid-Afrika is om die behoefte aan rekenargeletterdheid aan te spreek en terselfder tyd die bereiking van 'n voldoende peil van geletterdheid van sy bevolking te verseker.

Daar is tans in Suid-Afrika 'n aansienlike vloeibaarheid in onderwysbeleid. Die werkkomitee het kennis geneem van die bestaande onderwysbeleid en onlangse ontwikkelings en verwelkom die erkenning wat reeds gegee word aan die belangrikheid van die rekenaar in die onderwys. Bepaalde aksieplanne wat deur die werkkomitee voorgestel word, en wat by hierdie ontwikkelings in die onderwysbeleid aansluit, word in paragraaf 4 gegee.



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In the light of the above considerations, the mission of the investigation was reformulated as follows:

To satisfy the need for computer experts and literates of the South African industry in such a way that the efficient application of information technology can make an appropriate contribution to the increase of productivity and to the country's socioeconomic growth.

### 1.3 Modus operandi

This mission was regarded as an imaginary undertaking constituted by the training partnership (TTP) between the public and the private sectors. Throughout the investigation, the training partnership was used as a conceptual framework. It is an imaginary "undertaking" consisting of all training institutions in both sectors, that provide computer-orientated training or instruction. This conceptual framework enabled the research team to undertake its investigation, but plays no further role.

A systems approach was followed to improve understanding of the training partnership and to draw conclusions from observations. In this approach the TTP is regarded as a system, its constituent elements being all public and private training institutions which provide training and/or instruction in computer expertise and/or computer literacy. The structure of the system is determined by the elements themselves and the relationships between them. The system's behaviour is determined by its internal structure, its purpose and the external factors that affect it.

The environmental exploration and structural analysis of the TTP was then done by the research team by means of such interviews with representatives of the following interest groups:

- Education departments
- State departments.
- Universities.
- Technikons
- Technical colleges
- Private companies.

In total 77 interviews were conducted. The results of this environmental exploration and structural analysis were also used as inputs to analyse the strong and weak points, as well as the opportunities and threats with respect to achieving the mission.

The proposed plans of action made allowance for these factors in the sense that they were based on the identified strong points of the TTP and tried to turn to account the opportunities that were perceived. At the same time a sense of realism was maintained by taking cognizance of the existing weak points and external threats.

An extensive literature study was also undertaken to establish to what extent the problem addressed in this investigation is also experienced in other countries, in order to better understand the nature of the problem and to ascertain which solutions had already been proposed and perhaps even implemented. At the same time, cognizance was taken of South African literature sources that could be relevant in this regard.

In die lig van bogenoemde is die missie van die ondersoek soos volg herformuleer.

Om die behoefte aan rekenaarkundiges en rekenaargeletterdes binne die Suid-Afrikaanse bedryfslewe sodanig te bevredig dat doelmatige aanwending van inligtingstechnologie 'n toepaslike bydrae tot die verhoging van produktiwiteit en tot die sosio-ekonomiese groei van Suid-Afrika kan lewer.

### 1.3 Werkswyse

Hierdie missie is gesien as die missie van 'n denkbeeldige onderneming, gevorm deur die opleidingsvennootskap (DOV) tussen die openbare en die privaatsektor. Die opleidingsvennootskap is deurgaans in die ondersoek as 'n denkraamwerk gebruik. Dit is 'n denkbeeldige "onderneming" wat bestaan uit alle opleidingsinstansies in beide die openbare en die privaatsektor wat rekenaargeoriënteerde opleiding of onderrig verskaf. Hierdie denkraamwerk het die navorsingspan in staat gestel om sy ondersoekwerk te doen, maar speel geen verdere rol nie.

'n Sisteembenadering is gevolg om die opleidingsvennootskap beter te verstaan en afleidings uit waarnemings te maak. In hierdie benadering word die DOV as 'n sisteem beskou waarvan die elemente alle openbare en privaatopleidingsinstansies is wat opleiding en/of onderrig in rekenaarkundigheid en/of rekenaargeletterdheid verskaf. Die struktuur van die sisteem word bepaal deur die elemente self en hulle onderlinge verwantskappe. Die sisteem se gedrag word bepaal deur sy interne struktuur, die doel van die sisteem en deur eksterne faktore wat op die sisteem inwerk.

Die omgewingsverkenning en struktuuranalise van die DOV is deur die navorsingspan gedoen deur middel van gestruktureerde onderhoude wat met verteenwoordigers van die volgende belangegroepes gevoer is:

- Onderwysdepartemente
- Staatsdepartemente.
- Universiteite.
- Technikons
- Tegnieke Kolleges
- Privaatmaatskappye

In totaal is 77 onderhoude gevoer. Die resultate van hierdie omgewingsverkenning en struktuuranalise het ook gedien as inset tot 'n analise van die sterk- en swakpunte, en die geleenthede en bedreigings met betrekking tot die bereiking van die missie.

Die voorgestelde aksieplanne hou rekening met hierdie faktore deurdat gepoog is om te steun op die geïdentifiseerde sterkpunte van die DOV en deur die geleenthede wat gesien is, te benut. Terselfdertyd is realisme gehandhaaf deur kennis te neem van die bestaande swakpunte en eksterne bedreigings.

'n Uitgebreide literatuurstudie is ook onderneem om vas te stel tot watter mate die probleem wat in die ondersoek aangespreek is, ook in die buiteland ondervind word, die aard van die probleem daardeur beter te probeer verstaan, en vas te stel watter oplossings reeds aan die hand gedoen of moontlik selfs geïmplementeer is. Terselfdertyd is ook kennis geneem van Suid-Afrikaanse literatuurbronne wat in hierdie opsig relevant kon wees.



**2. Strategy****179A**

The systems approach that was followed in exploring the internal structure and the external environment of TTP was also followed here. The total economic system, within which IT plays an integral role, was taken into account. Here the task is more complex than merely to train more computer experts and to make more people computer literate. What needs attention is something of much wider compass—namely, the successful application of IT within South Africa's total economic setup. Indeed, that is why the manpower shortages at present being experienced gave rise to an investigation such as this one.

The strategy contains five components synergistically attuned to each other, to support the mission. The components are:

2.1 The population at large must be made aware of the importance, place, benefit and application of IT in present-day and future society.

2.2 A programme must be launched to apply IT as an instructional aid in formal and non-formal education, including manpower training.

2.3 By the year 2000 all school leavers must be functionally computer literate from Standard seven.

2.4 The respective training institutions must co-operate effectively and synergistically towards satisfying the need for computer experts and literates.

2.5 An alliance must be established between the public sector, training institutions and the computer industry in order to—

(a) promote the efficient and cost-effective application of information technology in a developing country,

(b) maintain South Africa's leadership, within the Africa context, in the application of information technology,

(c) make South Africa, by the year 2000, a winning nation in information technology.

**3. FACTORS WHICH ARE CRITICAL FOR ACHIEVING THE MISSION**

Certain factors can substantially influence the implementation of the strategy. The following critical success factors were taken into account when plans for implementing the strategy were identified:

3.1 Assignment of responsibility for implementing the proposed strategy.

3.2 Availability of full-time officials to accept the responsibility for actions aimed at implementation.

3.3 Acceptance of the strategic role of IT by the public sector, training institution and the computer industry.

3.4 Allocation of IT to a ministerial portfolio.

3.5 Establishment of a national computer instruction policy.

**2. Strategie**

Die sisteembenadering wat gevolg is in die verkenning van die interne struktuur en eksterne omgewing van die DOV is ook hier gevolg en die totale ekonomiese sisteem, waarbinne inligtingstechnologie 'n integrale rol speel, is in ag geneem. Dit gaan dus om meer as net om meer rekenaarkundiges op te lei en meer mense rekenaargeletterd te maak. Dit gaan om die groter saak van die suksesvolle aanwending van inligtingstechnologie binne die totale ekonomiese bestel van Suid-Afrika. Dit is immers waarom die mannekragtekorte wat tans ondervind word, hoegenaamd aanleiding gegee het tot 'n ondersoek soos die huidige.

Die strategie bestaan uit vyf komponente, wat sinergisties op mekaar afgestem is om die missie te ondersteun. Die komponente is:

2.1 Die bree bevolking moet bewus gemaak word van die belangrikheid, plek, nut en aanwending van inligtingstechnologie in die hedendaagse en toekomstige samelewing.

2.2 'n Program moet geloods word om inligtingstechnologie as 'n opleidingshulpmiddel in formele en nie-formele onderwys, mannekragopleiding ingesluit, aan te wend.

2.3 Teen 2000 moet alle skoolverlaters vanaf standaard sewe oor 'n funksionele rekenaargeletterdheid beskik.

2.4 Die onderskeie opleidingsinstansies moet doeltreffend en sinergisties saamwerk ten einde in die behoefte aan rekenaarkundiges en rekenaargeletterdes te voorsien.

2.5 'n Alliansie moet bewerkstellig word tussen die openbare sektor, opleidingsinstansies en die rekenaarbedryf as vennote om—

(a) die doelmatige en koste-effektiewe aanwending van inligtingstechnologie in 'n ontwikkelende land te bevorder,

(b) die leierskap van Suid-Afrika op die gebied van die aanwending van inligtingstechnologie binne die Afrika-konteks te handhaaf;

(c) Suid-Afrika teen 2000 'n wenland op die gebied van inligtingstechnologie te maak.

**3. FAKTORE WAT KRITIEK IS VIR DIE BEREIKING VAN DIE MISSIE**

Sekere faktore kan die implementering van die strategie wesenlik beïnvloed. Die volgende kritiese suksesfaktore is in ag geneem by die bepaling van aksieplanne vir die implementering van die strategie:

3.1 Toekenning van verantwoordelikheid vir die implementering van die voorgestelde strategie.

3.2 Beskikbaarheid van voltydse amptenare om verantwoordelikheid te aanvaar vir implementeringsaksies.

3.3 Aanvaarding van die strategiese rol van inligtingstechnologie deur die openbare sektor, opleidingsinstansies en die rekenaarbedryf.

3.4 Toekenning van inligtingstechnologie aan 'n ministersportefeulje.

3.5 Daarstelling van 'n nasionale rekenaaronderligbeleid.



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3.6 Change in the selection of study fields of school leavers.

3.7 Launching of follow-up actions arising from the proposed plans of action

3.8 Availability of finance for carrying out the proposed plans of action.

#### 4. PLANS OF ACTION

In total, six plans of action were proposed. Each plan of action was elucidated in greater detail in the main report. Here only the essential elements of each plan are summarized.

Various players in the IT industry and other parties are participants.

The various players are.

- Existing industry bodies\* (EIB)
- "The body" (BOD)
- Education departments (EDD)
- Tertiary education institutions (TEI)
- Postschool education institutions (PEI)
- Private training institutions (PTI)
- The Department of Trade and Industry (DTI)
- The Department of Manpower (DMP)
- The Cabinet (CAB)

"The body" refers to a possible additional player. It could be a new "body" or an existing body. The activities of "the body", as stated earlier, must *inter alia* be directed towards the following:

\* Note The Computer Society of South Africa, the Computer Users Council of South Africa, the Computing Services Association of South Africa, the Business Equipment Association, the National Computer Liaison Committee, The National Action Committee on Computing Auditing, the South African Council for Automation and Computation and the South African Institute for Computer Scientists

- Co-ordinating, facilitating, encouraging and evaluating training and instruction in computer expertise and computer literacy in order to raise output volumes and quality and to integrate those trained more closely with the business community
- Pro-active direction and advice concerning the local development of the IT industry (to the industry itself, to those entering the industry and to the authorities) and the application of resources.

An additional very important task of "the body" will be to act as a facilitator for the action programmes which are included in the plans of action.

In the context of this investigation, the term "private training institutions" refers to private undertakings that offer training in some aspect(s) of IT and/or applied IT. The term also encompasses private initiatives such as PRISEC (the Private Sector Educational Council) and OLSET (the Open Learning Systems Education Trust)

The table indicates the involvement of the various players and the assignment of responsibility for each of the plans. "I" refers to involvement and "P" to primary responsibility.

3.6 Verandering in die keuse van studierigtings van skoolverlaters

3.7 Loods van opvolgaksies wat voortspruit uit die voorgestelde aksieplanne.

3.8 Beskikbaarheid van finansies vir die uitvoering van die voorgestelde aksieplanne.

#### 4. 'AKSIEPLANNE

'n Totaal van ses aksieplanne word voorgestel. Besonderhede van elke aksieplan is in die volledige verslag uiteengesit. Hier word slegs die essensiële elemente van elke plan saamgevat.

Verskillende rolspelers in die inligtingstegnologiebedryf en ander partye is betrokke by hierdie aksieplanne.

Die verskillende rolspelers is:

- Bestaande industriëleliggame\* (BIL)
- "Die liggaam" (LIG)
- Onderwysdepartemente (ODE)
- Tersiere onderwysinstansies (TOI)
- Naskoolse onderwysinstansies (NOI)
- Privaatopleidingsinstansies (POI)
- Die Departement van Handel en Nywerheid (DHN)
- Die Departement van Mannekrag (DMK)
- Die Kabinet (KAB)

"Die liggaam" verwys na 'n moontlike verdere rolspeler. Dit kan 'n nuwe "liggaam" wees, of een van die reeds bestaande liggame. Die aktiwiteite van "Die liggaam" moet onder andere gerig wees op:

\* Nota Die Rekenaarvereniging van Suid-Afrika, die Rekenaargebruikersraad van Suid-Afrika, die "Computing Services Association of South Africa", die "Business Equipment Association", die "National Computer Liaison Committee", die "National Action Committee en Computing Auditing", die "South African Council for Automation and Computation" en die "South African Institute for Computer Scientists"

- Koordinering, fasilitering, bevordering en evaluering van opleiding en onderrig vir rekenaarkundigheid en rekenaargeletterdheid, ten einde uitsetvolumes en kwaliteit te verhoog en opgeleides beter met die bedryfslewe te integreer.
- Pro-aktiewe leiding en advies rakende die plaaslike ontwikkeling van die inligtingstegnologiebedryf (aan die bedryf, aan toetreders tot die bedryf en aan die owerheid) en die aanwending van hulpbronne

'n Baie belangrike verdere taak van "Die liggaam" sal wees om as fasiliteerder op te tree vir die aksieprogramme wat vervat is in die aksieplanne.

In die konteks van hierdie ondersoek verwys "privaatopleidingsinstansies" na privaatondernemings wat opleiding in een of ander aspek van die inligtingstegnologie en/of toepassings daarvan verskaf. Dit sluit egter ook privaatinisiatiewe soos PRISEC, die "Private Sector Education Council" en OLSET, die "Open Learning Systems Education Trust", in.

Die tabel gee 'n oorsig van die betrokkenheid van die verskillende rolspelers, en van die verantwoordelikheidstoekenning ten opsigte van elke van die aksieplanne. Betrokkenheid word met 'n "B" aangedui, en primêre verantwoordelikheid met 'n "P".

A target starting date and final date is given (in brackets) for each of the plans of action. The starting date refers to the beginning of the month mentioned; the final date, to the end of that month.

#### INVOLVEMENT OF THE VARIOUS ROLE PLAYERS IN THE PROPOSED PLANS OF ACTION

Players	Plans of action					
	4 1	4 2	4 3	4 4	4 5	4 6
EIB	I	I		I	I	I
EDD	I	I	P		I	I
TEI	I	I	I	I	I	I
PEI	I	I		I	I	I
PTI	I	I		I	I	I
DTI	I				I	
DMP	I	I		I	I	P
CAB					I	
BOD	P	P	I	P	P	

EIB Existing industry bodies

EDD Education departments

TEI Tertiary education institutions

PEI Postschool education institutions

PTI Private training institutions

DTI The Department of Training and Industry

DMP The Department of Manpower

CAB The Cabinet

BOD "The body"

#### 4.1 Plan of action 1: Awareness programme

This plan relates to the following component of the strategy:

The population at large must be made aware of the importance, place, benefit and application of information technology in the presentday and future society.

(a) Identify interest groups for a programme to make the population at large aware of the importance, place, benefit and application of IT (January 1992; April 1992)

(b) Identify sponsors for such a programme (January 1992; April 1992).

(c) Develop an awareness programme that makes use of all appropriate media (January 1992; June 1992).

(d) Put the awareness programme into operation from January 1993

(e) Monitor, evaluate and review strategy and plans of action annually.

Teikendatums wat by elke aksieplan gegee word, word in die formaat (Begindatum, Einddatum) gegee. By begindatums word die begin van die maand wat genoem word, bedoel, en by einddatums, die einde van die maand.

#### BETROKKENHEID VAN DIE VERSKILLENDEN ROLSPELERS BY DIE VOORGESTELDE AKSIEPLANNE

Rolspeleers	Aksieplanne					
	4 1	4 2	4 3	4 4	4 5	4 6
BIL	B	B		B	B	B
ODE	B	B	P		B	B
TOI	B	B	B	B	B	B
NOI	B	B		B	B	B
POI	B	B		B	B	B
DHN	B				B	
DMK	B	B		B	B	P
KAB					B	
LIG	P	P	B	P	P	

BIL Bestaande industrielliggame

ODE Onderwysdepartemente

TOI Tersiëre onderwysinstansies

NOI Naskoolse onderwysinstansies

POI Privaatopleidingsinstansies

DHN Die Departement van Handel en Nywerheid

DMK Die Departement van Mannekrag

KAB Die Kabinet

LIG "Die liggaam"

#### 4.1 Aksieplan 1: Bewusmakingsprogram

Hierdie aksieplan het betrekking op die volgende komponent van die strategie:

Die bree bevolking moet bewus gemaak word van die belangrikheid, plek, nut en aanwending van inligtingstegnologie in die hedendaagse en toekomstige samelewing.

(a) Identifiseer belangegroepes vir 'n program vir die bewusmaking van die bree bevolking van die belangrikheid, plek, nut en aanwending van inligtingstegnologie (Januarie 1992, April 1992).

(b) Identifiseer borge vir so 'n program (Januarie 1992, April 1992)

(c) Ontwikkel 'n bewusmakingsprogram wat van alle toepaslike media gebruik maak vir so 'n program (Januarie 1992, Junie 1992).

(d) Stel die bewusmakingsprogram vanaf Januarie 1993 in werking

(e) Monitor, evalueer en hersien strategie en aksieplan jaarliks.



**149A** *Elucidation*

The awareness campaign should be seen as a programme to market the plans made for implementing the mission of the investigation. The premise is thus that when the results of the investigation have been accepted, and when the parties concerned have decided to implement the proposed strategy and the plans of action that go with it, a marketing programme should be launched to support the execution of the plans. The awareness campaign must be handled in such a way that it carries the following message to the individual: Attaining computer literacy may be very beneficial—this may open the door to active participation in the economic society

Unless the individual accepts this basic message and in fact wishes to become computer literate, no success can be expected with an endeavour that could then be viewed as a one-sided decision that the population simply will become computer literate. There is a danger that such a viewpoint may also question the reasons for upholding computer literacy as something to strive for

**4.2 Plan of action 2: Information technology as instruction aid**

This plan concerns the following component of the strategy:

A programme must be launched to apply IT as an instruction aid in formal and non-formal education, including manpower training

(a) Develop a plan for the promotion and use of computer-assisted instruction (CAI) in formal school education (January 1992, December 1993)

(b) Develop a plan for the promotion and use of CAI in non-formal education, manpower training included, at national level (January 1992, December 1993)

(c) Provide adequate computer equipment to all schools able to employ it effectively for CAI (Final date, December 1993).

(d) Put plans into operation (January 1994).

*Elucidation*

It is of the utmost importance that a programme such as this to use CAI in schools should first win the teachers for the cause. It is understandable that teachers without an adequate computer background will be negative and even apprehensive about the intrusion of the computer into their territory. Such an attitude must be overcome by persuading them of the benefit and practicability of the computer in teaching

There need not be a watertight division between formal and non-formal education. Certain schools will be able to use computer facilities made available by private firms, and such partnerships must at all costs be encouraged. It is therefore by no means intended that education departments should alone accept responsibility for CAI in formal school instruction. Where possible facilities should be utilized that can be employed elsewhere. That would obviously decrease considerably the cost implications of this plan of action

*Toeligting*

Die bewusmakingsprogram moet gesien word as 'n bemarkingsprogram van die beplande poging om uitvoering te gee aan die missie van hierdie ondersoek. Die uitgangspunt is dus dat nadat die resultate van hierdie ondersoek aanvaar is, en die betrokke partye besluit het om die voorgestelde strategie met bybehorende aksieplanne uit te voer, daar 'n bemarkingsprogram geloods moet word om die uitvoering van die planne te ondersteun. Die bewusmakingsprogram moet só hanteer word, dat dit die draer van 'n boodskap aan die individu is: Om 'n rekenaargeletterdheid te bekom, kan tot groot voordeel wees omdat dit die deur tot aktiewe deelname aan die ekonomiese samelewing kan open.

Tensy die individu hierdie basiese boodskap aanvaar en inderdaad rekenaargeletterd wil word, kan nie verwag word om sukses te behaal met 'n poging wat dan gesien sou kon word as 'n eensydige besluit dat die bevolking eenvoudig rekenaargeletterd móet word. Die gevaar bestaan dat so 'n siening ook die redes waarom rekenaargeletterdheid iets is wat nagestreef moet word, sal bevraagteken.

**4.2 Aksieplan 2: Inligtingstechnologie as opleidingshulpmiddel**

Hierdie aksieplan het betrekking op die volgende komponent van die strategie:

'n Program moet geloods word om inligtingstechnologie as 'n opleidingshulpmiddel in formele en nie-formele onderwys, mannekrageopleiding ingesluit, aan te wend

(a) Ontwikkel 'n plan vir die promosie en gebruik van rekenaargestesteunde onderrig (RGO) in die formele onderwys op skoolvlak (Januarie 1992, Desember 1993)

(b) Ontwikkel 'n plan vir die promosie en gebruik van RGO in die nie-formele onderwys, mannekrageopleiding ingesluit, op nasionale vlak (Januarie 1992, Desember 1993).

(c) Voorsien voldoende rekenaartoerusting aan alle skole wat dit doeltreffend kan benut om rekenaargestesteunde onderrig aan te bied (Einddatum Desember 1993)

(d) Stel planne in werking (Januarie 1994).

*Toeligting*

Dit is van die grootste belang dat so 'n program om van rekenaargestesteunde onderrig in skole gebruik te maak, eerstens die onderwysers vir die saak moet wen. Dit is verstaanbaar dat onderwysers wat nie oor 'n voldoende rekenaaragtergrond beskik nie, 'n negatiewe houding en selfs vrese sal hê oor die indringing van die rekenaar op hulle terrein. Die houding moet doeltreffend oorkom word deur sulke onderwysers te oortuig van die nut en bruikbaarheid van die rekenaar in die onderrigsituasie.

Dit is ook belangrik om te besef dat daar nie 'n waterdige skeiding hoef te wees tussen formele en nie-formele onderwys in hierdie saak nie. Sekere skole sal gebruik kan maak van rekenaargenewe by privaat-firmas wat tot hulle beskikking gestel word, en sulke vennootskappe moet ten alle koste aangemoedig word. Dit is dus hoegenaamd nie die bedoeling dat onderwysdepartemente alleen die verantwoordelikheid moet aanvaar vir rekenaargestesteunde onderrig in die formele skoolonderwys nie. Waar moontlik, moet genewe wat elders gebruik kan word, benut word. Uiteraard sal dit die koste-implikasies van hierdie aksieplan aansienlik verminder.



**4.3 Plan of action 3: Computer literacy** (179A)

This plan relates to the following component of the strategy:

By the year 2000 all school leavers must be functionally computer literate from Standard seven.

(a) Introduce a compulsory computer literacy course and guidelines for the integration of computers in various fields of study as part of the initial training programme for all teachers of all education departments (January 1992; December 1994).

(b) Introduce computer literacy as a compulsory part of the school curriculum (January 1996)

(c) (i) Provide adequate computer equipment (e.g. one computer for 50 students) to all schools that can use it effectively in offering computer literacy courses. These computers are accommodated in one or two laboratories (Final date: December 1995).

(ii) Provide at least one computer per classroom (for use by the teacher) to all schools in South Africa in support of the integration of computers into school subjects (January 1992, December 1994)

**Elucidation**

Here, as in the previous plan of action, teachers must first be prepared to handle the envisaged curriculum for computer literacy and the integration of the computer as a teaching aid before it can be introduced at school level.

It has not yet been spelt out at what level the course should be introduced. This, of course, must be decided on before the curriculum is developed.

This plan of action has two parts to it: the use of computers by teachers in their teaching of subjects, and the institution of a separate computer literacy course.

In support of the first, each teacher must have a computer in the classroom and be able to use it. The intention here is that the teacher should employ it for ordinary supportive tasks and that the class should be able to see and follow what is going on. Thus a History teacher could show a table containing important dates and occurrences relevant to a part of the teaching programme, or a table with the terms of a particular agreement. In this way, in addition to the benefit to the teacher, a clear message is brought to the learner, namely that the computer is a very useful aid and not an intimidating piece of equipment that can be used only by an elite corps after they have achieved a sufficiently high level of performance in Mathematics.

In support of the second part of the plan of action, a school must have an adequately equipped "computer laboratory" in which the compulsory computer literacy course is taught. Quite a number of schools already do have such "laboratories" as a result of the initiative of parents and with the help of the school fund. Other

**4.3 Aksieplan 3: Rekenaargeletterdheid**

Hierdie aksieplan het betrekking op die volgende komponent van die strategie:

Teen 2000 moet alle skoolverlaters 'n standaard sewe oor 'n funksionele rekenaargeletterdheid beskik.

(a) Stel 'n verpligte rekenaargeletterdheidskursus en riglyne vir die integrering van rekenaars in verskeie vakrigtings in as deel van die inisiele opleidingsprogram van alle onderwysers van alle onderwysdepartemente (Januarie 1992; Desember 1994).

(b) Stel rekenaargeletterdheid in as 'n verpligte deel van die skoolkurrikulum (Januarie 1996).

(c) (i) Voorsien voldoende rekenaartoerusting (byvoorbeeld, een rekenaar per vyftig leerlinge) aan alle skole wat dit doeltreffend kan benut om rekenaargeletterdheidskursusse te kan aanbied. Hierdie rekenaars word in een of twee laboratoria gehuisves (Einddatum: Desember 1995).

(ii) Voorsien minstens een rekenaar per klaskamer (vir gebruik deur die onderwyser) aan alle skole in Suid-Afrika ter ondersteuning van die integrering van rekenaars in skoolvakke (Januarie 1992, Desember 1994).

**Toeligting**

Hier, net soos in die vorige aksieplan, moet onderwysers eers voorberei word om die beoogde kurrikulum vir rekenaargeletterdheid en die integrering van die rekenaar as onderwys hulpmiddel te kan hanteer voordat dit op skoolvlak ingestel word.

Dit word nog nie uitgespel op watter vlak die kursus ingestel moet word nie, en dit sal vanselfsprekend bepaal moet word voordat die kurrikulum ontwikkel word.

Dit is belangrik om te besef dat hierdie aksieplan twee komponente het: eerstens, die gebruik van rekenaars deur die onderwysers in hulle vakonderrig, en tweedens, die instelling van 'n afsonderlike rekenaargeletterdheidskursus.

Ter ondersteuning van eersgenoemde moet elke onderwyser oor 'n rekenaar in die klaskamer beskik, en dit in die onderrig situasie kan gebruik. Die bedoeling hier is dat die onderwyser dit vir gewone ondersteunende take moet gebruik, wat sigbaar aan die klas is. So, byvoorbeeld, kan 'n geskiedenis onderwyser 'n tabel vertoon van belangrike datums en gebeurtenisse wat betrekking het op 'n sekere deel van die onderrigprogram, of 'n tabel met die bepalings van 'n bepaalde ooreenkoms. Hierdeur, naas die nuttigheid vir die onderwyser self, word 'n duidelike boodskap aan die skool oorgedra, naamlik dat die rekenaar 'n baie nuttige hulpmiddel is, en nie 'n intimiderende stuk toerusting wat net deur 'n elitekorps gebruik kan word nadat hulle 'n voldoende hoe prestasie in wiskunde behaal het nie.

Ter ondersteuning van die tweede komponent van die aksieplan moet 'n skool oor 'n voldoende toegeruste "rekenaarlaboratorium" beskik waarin die verpligte rekenaargeletterdheidskursus aangebied kan word. Heelwat skole beskik reeds oor dergelike "laboratoria" wat deur die inisiatief van ouers en met



179A schools could make use of facilities not necessarily on the premises but placed at their disposal. Imaginative approaches must be sought, and again the intention is not that responsibility for acquiring facilities should simply be shoved off on to education departments but that here also the partnership principle should be pursued.

The curriculum for the computer literacy course is not dealt with in any detail. It is merely stated that it should be developed. Considerable work in this regard has already been done, for example Part 5 of the HSRC Investigation into The Computer in Education and Training of 1982/83 is devoted to strategies for the introduction of computer awareness and computer literacy, and contains framework programmes for that purpose.

The work committee's standpoint is that computer literacy should certainly be dealt with formally at school level through a planned curriculum and not on an undisciplined "come along, let's get to know the computer" basis. Such an approach will result as a rule only in acquaintance with one or other package—and the value of that is doubtful.

It is understood that the revision of school and subject curricula occurs in planned phases, and that the revisions proposed here must fit into the existing cycle. But where feasible, short-cuts should be found, for instance by making use of the possibility of interim revision of certain modules of a curriculum. In that way unnecessary delay can be avoided in attacking computer illiteracy.

#### 4.4 Plan of action 4: Synergy between training institutions

This plan relates to the following component of the strategy.

The respective training institutions must co-operate effectively and synergetically towards satisfying the need for computer experts and literates.

(a) Create various forums for opportunities to discuss at least annually the roles of the respective training institutions (From June 1992)

(b) Create a forum for regular annual contact between instructors and the IT industry (From June 1992)

(c) Institute an effective electronic communication channel for computer-assisted co-operative work between all players in the IT industry (January 1992, December 1992).

(d) Simultaneously with the above, determine in detail the need for computer experts and computer literates, and prepare a framework to ensure effective and synergetic co-operation between training institutions (January 1992, December 1992)

(e) Develop additional minimum standards (as already urged by the CUC) for postsecondary training in the computer field, and review these standards continually (January 1992 -)

ondersteuning van die skoolfonds daargestel is. Ander skole sal weer gebruik kan maak van fasiliteite wat nie noodwendig by die skool is nie, maar tot beskikking van die skool gestel kan word. Verbeeldingryke oplossings moet gesoek word, en weer eens is die bedoeling nie dat die verantwoordelikheid vir die daarstelling van geniewe bloot afgeskuif word op onderwysdepartemente nie, maar dat vennootskapoplossings gesoek moet word.

Die kurrikulum van die rekenaargeletterdheidskursus word nie in enige besonderhede aangespreek nie—inderdaad word net gestel dat dit ontwikkel moet word. Heelwat werk in hierdie verband is reeds gedoen, byvoorbeeld, Deel 5 van die RGN-onderzoek van 1982/83 na Die Rekenaar in Onderwys en Opleiding is gewy aan strategieë vir die invoer van rekenaarbewustheid en rekenaargeletterdheid, en bevat raamwerkprogramme daarvoor.

Dit is die standpunt van die werkkomitee dat rekenaargeletterdheid wel formeel aangespreek moet word op skoolvlak via 'n beplande kurrikulum, en nie slegs op ongedissiplineerde wyse aangebied moet word as 'n "kom maak kennis met die rekenaar nie". So 'n kennismaking-benadering sal meestal slegs uitloop op gebruiksblootstelling aan een of ander pakket, en die waarde daarvan is twyfelagtig.

Daar word beseft dat die hersiening van skool- en vakkurrikula in beplande hersieningsfases geskied, en dat die hersienings wat hier voorgestel word, sal moet inskakel by die bestaande siklus. Waar moontlik, moet kortpaare egter gevind word—byvoorbeeld, deur gebruik te maak van die moontlikheid om tussentydse hersiening van bepaalde modules van 'n kurrikulum te doen. Daardeur kan verhoed word dat die instelling van 'n aanval op rekenaarongeletterdheid onnodig vertraag word.

#### 4.4 Aksieplan 4: Sinergisme tussen opleidingsinstansies

Hierdie aksieplan het betrekking op die volgende komponent van die strategie.

Die onderskeie opleidingsinstansies moet doeltreffend en sinergisties saamwerk ten einde in die behoefte aan rekenaarkundiges en rekenaargeletterdes te voorsien.

(a) Skep verskillende forums vir geleenthede om minstens jaarliks die rolle van die onderskeie opleidingsinstansies te bespreek (Vanaf Junie 1992)

(b) Skep 'n forum vir gereelde jaarlikse kontak tussen opleiers en die inligtingstechnologiebedryf (Vanaf Junie 1992).

(c) Stel 'n doeltreffende elektroniese kommunikasiekanaal vir rekenaarondersteunde kooperatiewe werk tussen alle rolspelers in die inligtingstechnologiebedryf in (Januarie 1992, Desember 1992)

(d) Bepaal, gelyktydig met bogenoemde, in besonderhede die behoefte aan rekenaarkundiges en rekenaargeletterdes en stel 'n raamwerk op om doeltreffende en sinergistiese samewerking van opleidingsinstansies te verseker (Januarie 1992, Desember 1992).

(e) Ontwikkel verdere minimum standaarde (soos reeds deur die Rekenaargebruikersraad aangevoer) vir na-sekondêre opleiding in die rekenaarveld en hersien hierdie standaarde voortdurend (Januarie 1992 -)



*Elucidation*

(179A)

The point of departure of this investigation was the shortage of computer experts and literates in South Africa. Although an endeavour was made to quantify this shortage, it soon became apparent that a much more scientific approach was needed than simply to ask a number of persons what their shortages were, and to calculate an average of their answers.

Such an approach results, in respect of computer experts, in only a vague reflection of the average number of vacancies that undertakings have, and cannot be regarded as a reliable estimate of actual shortages. The figures in respect of computer literates obtained in this way would be totally unreliable.

The only way in which to make dependable estimates of the actual shortages of computer experts and literates is to ascertain where South Africa now stands in comparison with other countries that have already progressed further with the successful integration of IT into the economic life of the society. Simply put, it means that it must be ascertained how many computer experts and computer literates there are per thousand of the population in such countries, and what a realistic target for South Africa would be.

It became clear that there is uncertainty about the optimal use of manpower in the computer industry. The determination of the "actual" need must take this sub-optimal use into account before an estimate can be made of the net shortage.

Reliable statistics are not at present available about the capacity and utilization of the various training institutions. Given the net shortage, it must first be established whether they can in any way meet it. Within the parameters of their possible capacity and utilization (allowing for the extension or increase of both) realistic targets can then be set for the production of computer experts and literates.

The result of all these investigations is not a master plan for the provision of high-level manpower for the computer industry: It is guidelines that can be followed by the respective institutions, taking into account prevailing market forces. It is obvious that the guidelines will have to be revised from time to time, and that this cannot be regarded as a one-off exercise.

Synergy between the various training institutions will not occur of its own accord. It must be promoted by discussion and exchange of views. There are at present clear signs of role confusion. This can be corrected only by talking about the roles of the players—and the talking must be done by the players themselves. There is a need for a forum for mutual consultation between players, and for a forum to discuss matters within their own circle. Opportunities for both should be created and maintained.

*Toeligting*

Die vertrekpunt van hierdie ondersoek was die tekort wat aan rekenaarkundiges en rekenaargeletterdes ondervind word. Alhoewel gepoog is om die kwantitatiewe omvang van hierdie tekort vas te stel, het dit gou geblyk dat 'n baie wetenskapliker benadering nodig sou wees as om bloot 'n aantal persone te vra wat hulle tekorte is, en daarvan die gemiddeld te neem.

So 'n benadering lewer, ten opsigte van rekenaarkundiges, slegs 'n resultaat wat 'n vae weerspieëling is van die gemiddelde aantal vakatures wat ondernemings het, en kan nie beskou word as 'n betroubare skatting van werklike tekorte nie. Ten opsigte van rekenaargeletterdes is die syfers wat so verkry sou word, totaal onbetroubaar.

Die enigste manier om betroubare skattings van die werklike tekorte aan rekenaarkundiges en rekenaargeletterdes te verkry, is om te bepaal waar Suid-Afrika tans staan in vergelyking met ander lande wat reeds verder gevorder het op die pad na die suksesvolle integrering van inligtingstechnologie in die ekonomiese samelewing. Simplisties gestel beteken dit dat vasgestel moet word hoeveel rekenaarkundiges en rekenaargeletterdes per duisend van die bevolking sodanige land(e) het, en wat realistiese mikpunte vir Suid-Afrika sou wees.

Dit het duidelik geblyk dat daar twyfel bestaan oor die optimale aanwending van mensekrag in die rekenaarbedryf. Die bepaling van die "werklike" behoefte moet hierdie suboptimaliteit in ag neem voordat 'n beraming van die netto tekorte gemaak kan word.

Betroubare syfers is nie tans beskikbaar oor die kapasiteit en benutting van die verskillende opleidingsinstansies nie. Gegee die netto behoefte, moet dus eers vasgestel word of hierdie behoefte hoegenaamd deur die bestaande opleidingsinstansies bevredig kan word. Binne die raamwerk van die moontlike kapasiteit en benutting (met toelating vir uitbreiding of verhoging van beide), kan dan realistiese mikpunte vir die produksie van rekenaarkundiges en rekenaargeletterdes gestel word.

Die resultaat van al hierdie ondersoeke is nie 'n meesterplan vir die voorsiening van hoëvlakmensekrag vir die rekenaarbedryf nie, maar riglyne wat deur die onderskeie instansies met inagneming van heersende markkragte gevolg kan word. Dit spreek vanself dat hierdie riglyne van tyd tot tyd hersien moet word, en dat dit nie as 'n eenmalige oefening gesien kan word nie.

Sinergisme tussen die verskillende opleidingsinstansies sal nie op natuurlike wyse tot stand kom nie. Dit moet deur gesprek en uitwisseling van gedagtes bevorder word. Daar is duidelike tekens vanolverwaring, wat alleen oorkom kan word deur oor die rolle van die spelers te praat—en hierdie praat moet deur die rolspelers self gedoen word. Daar is 'n behoefte aan 'n forum vir gesprekvoering van rolspelers onderling, en in eie kring, en vir albei moet geleentheid geskep en in stand gehou word.



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Training and instruction are always exposed to the danger of losing touch with practical demands. This may be exceedingly so when practice is impelled by a fast-changing technology, as is the case here. Practice cannot stand aloof from this quandary. It must interact with training and instruction. It must take its own direction-setting inputs, it must accept co-responsibility for the product that is delivered. It is accordingly essential that trainers, educators and the IT industry keep in regular contact, and that a special forum be established to ensure that the contact is structured and does not happen haphazardly. This does not mean that individual training institutions should neglect their own links and channels of communication. On the contrary, these must be strongly encouraged.

Around the world computer-assisted co-operative work is rapidly becoming a *modus operandi* that breaks through boundaries and promotes a synergy among the players in the IT industry. The backbone of the co-operative work is electronic communication between the players. The UNINET network already provides a valuable service to various universities. This facility must be extended to reach all players.

The work committee expressed its conviction that accreditation would eventually have to become an objective of the industry. At the moment, sentiments regarding such a mechanism differ, with a considerable number in favour of, but probably just as many against accreditation. As a first step in this direction additional minimum standards, already developed for certain fields by the CUC, should be set. Such standards are not enforceable, but goals which can be strived for and which can be followed on a voluntary basis by training institutions.

#### 4.5 Plan of action 5: An alliance between the parties involved

This plan relates to the following component of the strategy:

An alliance must be established between the public sector, training institutions and the computer industry in order to—

- promote the efficient and cost-effective application of information technology in a developing country,
- maintain South Africa's leadership, within the Africa context, in the application of information technology,
- make South Africa, by the year 2000, a winning nation in information technology.

(a) Investigate the present contribution of IT to productivity and determine its potential contribution to South Africa's socioeconomic growth (January 1992; December 1992).

(b) Investigate the contribution South Africa is now making in the IT field in the Africa context, and what this should be for South Africa to maintain her leader role (January 1992, December 1992)

Opleiding en onderrig is altyd blootgestel aan die gevaar dat dit die verband met die eise van die praktyk kan verloor. Dit is in ekstreme mate die geval wanneer die praktyk gedryf word deur 'n vinnig veranderende tegnologie, soos hier die geval is. Die praktyk kan nie afsydig staan teenoor hierdie dilemma van die opleidingsinstansie en opleier/opvoeder nie, maar moet in wisselwerking met opleiding en onderrig verkeer om enersyds rigtinggewende bydraes te maak, en andersyds mede-verantwoordelikheid te aanvaar vir die produk wat gelewer word. Dit is dus van die grootste belang dat opleiers, opvoeders en die inligtingstegnologiebedryf gereelde kontak moet hê, en dat 'n spesifieke forum geskep word om te verseker dat hierdie kontak gestruktureerd en nie slegs lukraak plaasvind nie. Uiteraard beteken dit nie dat individuele opleidingsinstansies nie hulle eie kontakbasisse in stand moet hou nie—intendeel, dit moet ten sterkste aangemoedig word.

Rekenaarondersteunde kooperatiewe werk is vinnig besig om oral in die wêreld 'n werkswyse te word wat grense afbreek en sinergisme tussen rolspelers in die inligtingstegnologiebedryf bevorder. Die ruggraat vir hierdie werkswyse is elektroniese kommunikasie tussen rolspelers. Die UNINET-netwerk lewer hier reeds waardevolle diens aan verskillende universiteite. Hierdie fasiliteite moet uitgebrei word om alle rolspelers te betrek.

Die werkkomitee is oortuig dat akkreditering uiteindelik 'n doelwit van die bedryf sal moet word. Tans is daar gemengde gevoelens oor so 'n meganisme, met heelwat voorstanders en waarskynlik netsoveel teenstanders daarvan. As 'n eerste stap in daardie rigting, moet verdere minimumstandaarde, soos reeds deur die Rekenaargebruikersraad vir sekere terreine ontwikkel is, daargestel word. Sulke minimumstandaarde is nie afdwingbare standaarde nie, maar mikpunte waarna gestreef kan word en wat op vrywillige basis deur opleidingsinstansies nagevolg kan word.

#### 4.5 Aksieplan 5: Alliansie tussen betrokke partye

Hierdie aksieplan het betrekking op die volgende komponent van die strategie:

'n Alliansie moet bewerkstellig word tussen die openbare sektor, opleidingsinstansies en die rekenaarbedryf as vennote om—

- die doelmatige en koste-effektiewe aanwending van inligtingstegnologie in 'n ontwikkelde land te bevorder;
- die leierskap van Suid-Afrika op die gebied van die aanwending van inligtingstegnologie binne die Afrika-konteks te handhaaf,
- Suid-Afrika teen 2000 'n wenland op die gebied van inligtingstegnologie te maak.

(a) Ondersoek die huidige bydrae van inligtingstegnologie tot produktiwiteit en bepaal die potensiele bydrae tot die sosio-ekonomiese groei van Suid-Afrika (Januarie 1992, Desember 1992)

(b) Ondersoek die bydrae wat Suid-Afrika tans op die gebied van inligtingstegnologie binne Afrika-konteks maak, en wat dit behoort te wees om Suid-Afrika se leiersrol te handhaaf (Januarie 1992, Desember 1992).



(c) Inquire into what is necessary to make South Africa a winning nation in the field of IT by 2000 (January 1992, December 1992).

(d) Arrange financing for all programmes (June 1993, December 1993).

(e) Prepare recommendations that spell out the role of the partners in the above programme.

(f) Establish the alliance through a formal co-operation agreement between the partners to execute these programmes. (Final date: January 1994)

(g) Monitor, evaluate and review the programmes annually (January 1994-).

#### *Elucidation*

The first three components of this plan relate to additional investigations that must be conducted. The detail given in respect of each investigation is obviously not yet complete. But the structure of each should be the same. Taking into account local and global circumstances and also strategic considerations, set a strategic target; determine where South Africa now stands in relation to the target; develop a programme which spells out the contribution of each partner towards reaching the target.

It is important that the problem of obtaining finance should be seen as one affecting every party concerned, and not one to be solved by the state alone. That is why it is presented as part of this Plan 5, in which the involvement of the public sector, training institutions and the computer industry as partners is addressed. Here, too, there will have to be a partnership solution.

#### **4.6 Plan of action 6: Establishment of "the body"**

As part of the proposed programme, finality must be reached concerning the "body" referred to earlier. The body plays an extremely important overarching role in the entire strategy. Plan 6 is therefore one of the first activities that should be completed.

(a) Decide on the establishment of a "body" which can function as a facilitator of the programmes of action designed to execute the strategy (October 1991, December 1991).

#### *Elucidation*

No standpoint is taken in this investigation as to whether one of the existing industry bodies is able to play the role of "the body". The most straightforward approach is, as set out above, to investigate the matter objectively and come to a conclusion. It is important that the investigation should be conducted by the industry bodies themselves, and that all players should be involved. A facilitator should guide this process. It is recommended that the NTB should be this facilitator.

(c) Onderzoek wat nodig is om Suid-Afrika teen 2000 'n inligtingstechnologie-wenland te maak (Januarie 1992; Desember 1992).

(d) Verkry finansiering vir alle aksieprogramme (Junie 1993, Desember 1993).

(e) Berei aanbevelings voor wat die rol van die vennote in bogenoemde aksieprogramme uitspel.

(f) Vestig die alliansie deur 'n formele samewerkings-ooreenkoms tussen die vennote om hierdie aksieprogramme uit te voer (Einddatum: Januarie 1994).

(g) Monitor, evalueer en hersien die aksieprogramme jaarliks (Januarie 1994-).

#### *Toeligting*

Die eerste drie komponente van hierdie aksieplan het betrekking op verdere ondersoeke wat uitgevoer moet word. Die detail wat ten opsigte van elke ondersoek gegee word, is uiteraard nog nie volledig nie. Die struktuur behoort in elke geval dieselfde te wees: Stel, met inagneming van lokale en globale omstandighede, en op grond van strategiese oorwegings, 'n strategiese mikpunt, bepaal waar Suid-Afrika tans staan ten opsigte van die mikpunt; ontwikkel 'n aksieprogram wat die bydrae van elke vennoot uitspel om die mikpunt te bereik.

Dit is belangrik dat die finansieringsprobleem gesien moet word as 'n probleem wat alle partye raak, en nie net 'n probleem wat deur die staat opgelos moet word nie. Daarom word dit as deel van hierdie aksieplan gegee, waarin die betrokkenheid van die openbare sektor, opleidingsinstansies en die rekenaarbedryf as vennote aangespreek word. Dit sal inderdaad ook 'n vennootskapoplossing moet wees.

#### **4.6 Aksieplan 6: Daarstelling van "Die liggaam"**

As deel van die voorgestelde aksieprogram moet uitsluitlik verkry word oor "Die liggaam" waarna vroeër verwys is. "Die liggaam" speel 'n uiters belangrike oorkoepelende rol in die hele program van aksieplanne, en die volgende aksieplan is daarom een van die eerste aktiwiteite wat voltooi behoort te word.

(a) Besluit oor die daarstelling van "Die liggaam" wat as fasiliteerder kan funksioneer van die aksieprogramme om uitvoering te gee aan die strategie (Oktober 1991, Desember 1991).

#### *Toeligting*

Geen standpunt word in hierdie ondersoek ingeneem oor die vraag of een van die bestaande industrielliggame die rol van "Die liggaam" kan vertolk of nie. Die suiwerste weg is om die saak objektief te ondersoek en tot 'n gevolgtrekking te kom. Dit is daarom ook van groot belang dat hierdie ondersoek deur die industrielliggame self gedoen moet word en dat alle rolspelers daarby betrokke moet wees. Hierdie proses moet onder leiding van 'n fasiliteerder geskied. Daar word aanbeveel dat die NOR hierdie rol moet vertolk.



**179A 5. RECOMMENDATIONS**

The work committee recommends that:

5.1 The report be handed over to the Minister of Manpower, the responsible Minister, for his consideration and with the view to announcing this report in the *Government Gazette* by means of a general notice, in which the comments of interested parties are invited.

5.2 The Department of Manpower, with due consideration to these comments, prepare a Cabinet memorandum in which approval in principle is requested for the proposed strategy and plans of action. Thereafter, the strategy and plans should be incorporated into a White Paper, to activate task groups appointed by the Minister of Manpower.

5.3 The task group(s) then launch a programme to follow up the investigation conducted by this work committee. This programme should comprise the following actions.

(a) To investigate the different possibilities according to which "the body" may be established (plan of action 4.6). (The work committee expressed the desire that the National Training Board should preferably act as facilitator in this regard.)

(b) To develop an awareness programme [plan of action 4.1 (c)].

(c) To determine in detail the need for computer experts and computer literates [plan of action 4.4 (d)].

(d) To investigate the present contribution of IT to productivity and to determine its potential contribution to South Africa's socio-economic growth [plan of action 4.5 (a)].

(e) To investigate the contribution South Africa is now making in the IT field in Africa context, and what this should be for South Africa to maintain her leader role [plan of action 4.5 (b)].

(f) To determine the elements essential in making South Africa a winning nation in the field of IT by 2000 [plan of action 4.5 (c)].

(g) To identify the different financing options for the plans of action [plan of action 4.5 (d)].

(23 August 1991)

**NOTICE 782 OF 1991****DEPARTMENT OF TRANSPORT****INTERNATIONAL AIR SERVICES ACT, 1949 (ACT No. 51 OF 1949), AS AMENDED**

Pursuant to the provisions of section 5 (a) and (b) of Act No. 51 of 1949 and regulation 5 of the Civil Air Services Regulations, 1964, it is hereby notified for general information that the application, details of which appear in the Schedules hereto, will be heard by the National Transport Commission.

Representations in accordance with section 6 (1) of Act No. 51 of 1949 in support of, or in opposition to, an application, should reach the Director-General Transport (Directorate Civil Aviation), Private Bag X193, Pretoria, 0001, and the applicant within 21 days of the date of publication hereof stating whether the party or parties making such representation intend to be present or presented at the hearing.

**5. AANBEVELINGS**

Die aanbevelings van die werkkomitee is dat:

5.1 Die verslag van die werkkomitee aan die Minister van Mannekrag, die verantwoordelike Minister, vir oorgewing voorgelê word met die oog daarop om die verslag by wyse van 'n algemene kennisgewing in die *Staatskoerant* bekend te stel en kommentaar daarop deur belanghebbendes aan te vra.

5.2 Die Departement van Mannekrag, met inagneming van die kommentaar, 'n Kabinetsmemorandum opstel waarin beginselgoedkeuring vir die aanbevole strategie en aksieplanne aangevra word om daarna in 'n Witskrif vervat te word ten einde taak-groepe wat deur die Minister van Mannekrag aangewys word, te aktiveer.

5.3 Hierdie taakgroep(e) dan 'n opvolgprogram van die ondersoek wat deur die werkkomitee uitgevoer is, bestaande uit die volgende opvolgaksies, loods:

(a) Om die verskillende moontlikhede om "Die liggaam" daar te stel, te ondersoek (aksieplan 4.6) (Die werkkomitee het die begeerte uitgespreek dat die Nasionale Opleidingsraad verkieslik in hierdie verband as fasiliteerder behoort op te tree.)

(b) Om 'n bewusmakingsprogram te ontwikkel [aksieplan 4.1 (c)].

(c) Om 'n detailbehoeftebepaling ten opsigte van rekenaarkundiges en rekenaargeletterdes te doen [aksieplan 4.4 (d)].

(d) Om die huidige bydrae van inligtingstechnologie tot produktiwiteit en die potensiele bydrae tot die sosio-ekonomiese groei van Suid-Afrika te ondersoek [aksieplan 4.5 (a)].

(e) Om die bydrae wat Suid-Afrika tans op die gebied van inligtingstechnologie binne Afrika-konteks lewer, en wat dit behoort te wees om Suid-Afrika se leiersrol te handhaaf, te ondersoek [aksieplan 4.5 (b)].

(f) Om die elemente wat nodig is om Suid-Afrika teen 2000 'n wenland op die gebied van inligtingstechnologie te maak, te bepaal [aksieplan 4.5 (c)].

(g) Om die verskillende finansieringsmoontlikhede van die aksieplanne te identifiseer [aksieplan 4.5 (d)].

(23 Augustus 1991)

**KENNISGEWING 782 VAN 1991****DEPARTEMENT VAN VERVOER****WET OP INTERNASIONALE LUGDIENSTE, 1949 (WET No. 51 VAN 1949), SOOS GEWYSIG**

Hierby word ingevolge die bepalings van artikel 5 (a) en (b) van Wet No. 51 van 1949 en regulasie 5 van die Regulasies vir Burgerlugdienste, 1964, vir algemene inligting bekend gemaak dat die Nasionale Vervoer-kommissie die aansoeke waarvan besonderhede in die Bylaes hieronder verskyn, sal aanhoor.

Vertoe ingevolge artikel 6 (1) van Wet No. 51 van 1949 ter ondersteuning of bestryding van 'n aansoek met die Direkteur-generaal Vervoer (Direktoraat Burgerlugvaart), Privaat Sak X193, Pretoria, 0001, en die aansoeker binne 21 dae na die datum van publikasie hiervan bereik en daarin moet gemeld word of die persoon of persone wat aldus vertoe rig, van plan is om die verrigtinge by te woon of om daar verteenwoordig te word.

AN EXPANSION of SA's manufacturing sector is dependent on three factors, effectively technology transfer and, ultimately, technological innovation itself.

One of the major constraints on technological innovation is funding. The realisation of the importance of the link between spending on research and development (R & D) and economic performance has led to large increases in R & D spending in Western countries.

Expenditure on R & D as a percentage of GDP has increased in Italy, France, Germany, Japan and the US in the past five years.

In the UK it has remained constant a relative decline in government expenditure has been matched by an increase in funding from the private sector and international agencies.

Unlike Thatcher, however, the SA government has been unsuccessful in persuading the private sector to pick

# R & D: manufacturing's neglected key

6/23/89

up the tab  
During the first half of the 1980s, R & D spending in SA as a percentage of GDP grew by small but significant amounts.

It rose from 0,74% in 1981/2 to 0,96% in 1985/6.

But in 1987/8 this figure dropped to only 0,88% of GDP. And the state is not the major culprit: although both state and private sector contributions dropped relative to GDP, the private sector's contribution has dropped by more.

The proportion of R & D financed by the private sector has remained constant at 41,3% since 1985/6, but has dropped since 1983/4, when it peaked at 51,2%.

In successful manufacturing economies like those of Japan and West Germany, the private sector

1991  
**MICHAEL CHERRY**

finances 67% of research and development.

The central problem in the private sector is a lack of in-house industrial R & D.

At a colloquium on Technology and Reconstruction held at UCT in May, Henne Smith, chief director, Technology and Industrial Strategy, at the Department of Trade and Industry, explained a scheme initiated last year in terms of which government funds half the costs, for five years, of R & D projects in the electronics industry. But he had to admit that only half of the R40m set aside for the project in its first year of

operation was utilised.

At the same meeting, Bernie Fanaroff of Numsa interpreted the lack of industrial R & D in terms of "management in SA being obsessed with short-term returns". He stressed that the union movement was not opposed to technological advances, provided they were accompanied by retraining programmes.

But government also has an important role to play. While it has made some attempt to facilitate technology transfer, urgent government intervention is required in fiscal measures to stimulate R & D spending by the private sector.

In SA at present no portion of R & D spending can be written off against tax. By comparison, 20% to 150% tax concessions exist in the manufacturing economies with

which SA needs to compete.

Perhaps the biggest obstacle to SA expanding its industrial capacity remains the technological proficiency of its workforce. In 1989 only 5% of the 200 000 black matriculation candidates were offered mathematics or physical science (on account of there being no teachers), and only 1% passed each subject, combining higher and standard grades.

The recently announced Education Renewal Strategy seeks to provide a vocational education for the majority of secondary school pupils. But unless the vocational stream receive a thorough grounding in these subjects, productivity levels in the workforce are likely to remain low. It is time for the government to face up to the fact that it is going to have to recruit large numbers of teachers in science and mathematics, and that the only way to do this is to remunerate them properly.

Cherry heads a research department at the South African Museum.

REVIEW



AN EXPANSION of SA's manufacturing sector is dependent on three factors: a technologically competent workforce, effective technology transfer and, ultimately, technological innovation itself.

One of the major constraints on technological innovation is funding. The realisation of the importance of the link between spending on research and development (R & D) and economic performance has led to large increases in R & D spending in Western countries.

Expenditure on R & D as a percentage of GDP has increased in Italy, France, Germany, Japan and the US in the past five years.

In the UK it has remained constant: a relative decline in government expenditure has been matched by an increase in funding from the private sector and international agencies.

Unlike Thatcher, however, the SA government has been unsuccessful in persuading the private sector to pick

# R & D: manufacturing's neglected key

8/10/87 23 | 8/9 |

up the tab  
During the first half of the 1980s, R & D spending in SA as a percentage of GDP grew by small but significant amounts

It rose from 0,74% in 1981/2 to 0,96% in 1985/6.

But in 1987/8 this figure dropped to only 0,88% of GDP. And the state is not the major culprit: although both state and private sector contributions dropped relative to GDP, the private sector's contribution has dropped by more.

The proportion of R & D financed by the private sector has remained constant at 41,3% since 1985/6, but has dropped since 1983/4, when it peaked at 51,2%.

In successful manufacturing economies like those of Japan and West Germany, the private sector

1998  
MICHAEL CHERRY

finances 67% of research and development.

The central problem in the private sector is a lack of in-house industrial R & D.

At a colloquium on Technology and Reconstruction held at UCT in May, Henne Smith, chief director, Technology and Industrial Strategy, at the Department of Trade and Industry, explained a scheme initiated last year in terms of which government funds half the costs, for five years, of R & D projects in the electronics industry. But he had to admit that only half of the R40m set aside for the project in its first year of

operation was utilised

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REVIEW



# Expenditure drops as social needs come to the fore

EXPENDITURE on research and development in South Africa is down to 0,6% of GNP — and falling CSIR president Dr Brian Clark says "Government is wrestling with social priorities while trying to control its spending"

"R&D is often regarded as a luxury that can be set aside for the time being"

"As a result, our ability to play a role in a world driven by technology is being unravelled — and what is lost overnight will take years to recover"

## Globalised

He says world markets are being globalised and the impact of information technology is becoming daily more evident

SA is losing ground in this sophisticated environment in which the leading contenders hurl billions of dollars into the ring in their efforts to remain at the cutting edge

Technologically advanced economies spend at least 2%, and many in the region of 3%-4%, of GNP on R&D — much of it put forward by the private sector. But the issue, says Clark,



BRIAN CLARK

is not the amount individual economies are willing to devote to R&D as much as their willingness to increase their commitment

"The leading industrialised nations have been growing the percentage of GNP spent on R&D

"Productivity gains and economic growth have, over the past decades, been conclusively linked to the impact of new technology

"International studies show technological development can account for 50%-80% of a country's economic growth

expenditure" spent purely into the development of military technology, but the industry has absorbed the attention of vast numbers of scientists and technicians and has given birth to private-sector manufacturing ventures

In addition, technological advances in armaments development have produced a diverse range of offshoots, with applications in every sphere of industrial and domestic life

From 1963, when the UN called for a voluntary arms embargo against SA, to 1989, real term expenditure on the SA Defence Force increased almost eightfold

Since then it has dropped steadily and steeply and the armaments industry — everywhere a focus of technological development — is plummeting

## Potential

In SA, however, there is little else in place to take up the slack

Industry will have to move fast to provide new potential for technological development or we will lose priceless human resources while millions of rands worth of capital investment stands idle

Armcor has taken up the challenge to realign itself with the new SA

A spokesman says "Two years ago, we embarked on a three-point strategy

# Private sector will have to foot the bill

GOVERNMENT spending on research and development has been upstaged by needs for social upliftment

For the foreseeable future, the impetus behind R&D will have to come from the private sector

But considerable barriers exist to prevent the private sector from using R&D in generating and manufacturing products for the market

The time, cost and financial risk involved is considerable and can seldom be justified by the small local market

On the other hand, SA's penetration into world markets has for years been

restricted by sanctions — and would-be exporters face enormous risks in taking on the highly competitive markets dominated by established international concerns

Much local technology is imported by means of agreements or licences which contain clauses prohibiting export

This has also served to restrict SA's penetration into world markets

Import parity pricing, as a result of tariff protection, has dealt a further blow, inflating the cost of local intermediary products

If the private sector is to take up the challenge, gov-

ernment must develop strategies that adjust the profit-to-risk ratio

The Department of Trade & Industry (DTI) is in the throes of developing a strategy aimed at encouraging technological development

DTI chief director of technology Dr Henne Smith says "We drafted a formal statement on technology policy and strategy last year and distributed it for comment in November

"The comments and interpretations received

## Strategy

The advantage of armaments research is that it is pitched at such a high level of quality that its products can readily meet the needs of general industry

The availability of a sophisticated R&D infrastructure backed by a forum to unite entrepreneurs and innovators could give technological development in SA a vital shot in the arm

"Armcor must be regarded as a national asset, available to work in partnership with the private sector," the spokesman says

## High level

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have been studied and incorporated into a second draft, which is being considered by the Minister of Trade & Industry and Tourism

To be effective, government's strategy will have to make the development, manufacture and export of goods more attractive, either by reducing the risk and cost factors or by increasing profitability

This would realise national advantages from innovation — which could motivate government to encourage investment in technology by enhancing profits realised by investors

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## Shortage of expertise has become chronic

*13/9/91*  
*179A*  
MANPOWER resources in the arena of science and technology are in a state of flux.

Large-scale rationalisation in statutory and private sector institutions has left many experts jobless.

But SA suffers a chronic shortage of scientific and technological skills

Unless it succeeds in restructuring its scientific and technological community in the near future, it could see an outflow of crucial personnel to greener pastures overseas — and the long-term effects would be crippling.

Foundation for Research Development (FRD) president Dr Reinhard Arndt says manpower analysts tend to spend too much time counting the number of science and engineering students and pay too little attention to the factors

that contribute to economic growth

"The SA economy must be strengthened by applying innovative, creative high technology to develop and manufacture marketable products for the world market.

"The people who transform novel technology into successful products are entrepreneurs trained in science, engineering and technology.

### Challenge

"Innovative scientists, engineers, technologists and technicians are worth their weight in gold," he says.

The challenge is for SA to establish a high technology network of small operations to create new employment potential for these people.

Historically, massive organisations employed the majority of scientists

and technologists.

Until recently, government was the major employer of these skills, particularly in so-called "strategic industries" and the provision of services.

In a healthy economy, however, the emphasis needs to be on wealth creation — and following this trend, most First World countries have seen a shift in the structure of the high-technology community.

"The trend is away from big corporations taking the lead in new hi-tech ventures towards the proliferation of innovative small businesses built up by teams of young entrepreneurs.

"These entrepreneurs are experts in specific fields, including technology, financing and marketing.

"The biggest obstacle to SA going this route, how-

ever, is the lack of availability of venture capital for entrepreneurs in the hi-tech field"

Arndt says the provision of venture capital in these cases is government's responsibility.

### Families

The combined efforts of the Industrial Development Corporation and the Small Business Development Corporation — backed by advice from local and international evaluation networks — could help establish families of hi-tech, innovative manufacturing businesses capable of holding their own in the international arena.

"SA can learn from the Far East, where proposals for establishing small industries based on high technology are evaluated by international leaders in specific fields," he says.



# Universities undertake 'jobbing' work

FINANCIAL pressure is forcing university research facilities to undertake commercial "jobbing" work for the private sector — while funds for fundamental research are increasingly hard to come by.

## Stifled

The effects of this are twofold: the growth of knowledge is being stifled, and researchers and students, deprived of meaningful challenges, are failing to develop their skills to their full potential.

Fundamental research is essential in setting the stan-

dards of modern scientific thought and creating the intellectual climate in which modern civilisation can flourish

Wits University deputy vice-chancellor Professor Friedel Sellschop says pure scientific research is essential in any nation that aspires to feed its people, keep them healthy, educate them to a level that relates to their talents, give them freedom for leisure and spiritual growth and provide employment that uses their abilities.

"Education in all its manifestations is central — educate or perish," he says.

The international role played by countries in the sphere of technology reflects their commitment to research

Japan leads the world as a technological force — and Sellschop says its research policies are a major reason

## Report

A report entitled The University Research System in Japan, published in 1988 by the Japanese Ministry of Education, Science & Culture

□ Defines science to include human, social and natural sciences and their applied researches,

□ Emphasises the cultural

value of science research, □ Regards scientific research as a driving force for the development of the world, (179A)

□ Defines the university as a centre of science, responsible for scientific research in human, social and natural sciences while training researchers, and

□ Maintains scientific research can bear fruit only if carried out on the basis of free choice by the researchers

In support of this philosophy, Japan spends 2.9% of GDP on R&D — a massive 11.8-trillion yen in 1989, of which 83% was contributed by industry

# Improving conditions in developing communities

SCIENTIFIC and technological research and development are not an end in themselves

To be appropriate — especially in the context of the new SA — they must impact favourably on the economy and population of a nation, says CSIR, president Dr Brian Clark

"R&D in this country has three priorities to develop unique technologies which will establish SA in the export market, to make decision-makers more effective, and to improve conditions in developing communities," he says

The importance of these priorities, he says, is enhanced by SA undergoing a process of constitutional negotiation

No country has been able to democratise its political structures at a time of negative economic growth

The goal of sustainable, healthy economic growth is vital to long-term socio-political success

The most obvious means of economic growth is the development of an export-oriented manufacturing industry

"SA is the export capital of Africa, particularly in manufactured goods where value has been added by unique technology.

"But our resources for investing in R&D are limited. We must plan carefully if we are to optimise our investment"

But while technological development can turn around the SA economy, technology's potential to impact on decision-making processes is more far-reaching

In the process, it will serve a twofold purpose — to improve the lot of the community and expose young minds to technology making them more able to enter a sophisticated work environment

"People are the only resource of lasting value any nation has

"We have to nurture that resource every way we can if we are to tap its potential," says Clark

Finally, he says, technology must be brought to bear on developing communities

Information technology can give the public sector more hospital beds and school desks for its rands — and it can enable the private sector to put together cost-effective, environmentally sensitive, flexible projects in a fraction of the time it would normally take

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13/9/91

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## The drive

B/day 13/9/91  
is for  
all to  
(179A)  
benefit

RESEARCH and development in the context of the new SA must be orientated towards meeting the needs of all, and not merely the privileged few, says Development Bank senior policy analyst Mike Muller.

"R&D has two priorities. to generate jobs for the 40% of our workforce unemployed and to meet the social needs for health care, education and the like," he says.

### Reorientate

"We must reorientate our spending towards meeting the needs of our poor with increased input from the private sector.

"At the same time, we must develop SA's export potential — which calls for a high level of technological sophistication"

These goals are seemingly contradictory — but Muller says Japan has millions of peasant farmers alongside its world-beating industries.

### Different

SA must adopt different policies in meeting its domestic and export needs.

"SA's technology needs to reflect its Third World nature more accurately if we are to achieve economic or socio-political balance

"We need to encourage job-generating investments which can be cost-effective and sophisticated enough to serve the southern African markets.

"But at the same time, we cannot afford to let go of our hi-tech capabilities, which can be geared towards the sophisticated international market."

## **I TECHNOLOGY**

### **Literacy in IT 'is the key to high-tech age'**

8 (Day) 26 (9/91) (179A)  
MOVES are afoot to determine the elements essential to making SA a winning nation in the information technology (IT) field by the year 2000

This is made clear in a report by the National Training Board and the Human Sciences Research Council's Education Research Programme of an investigation into training computer experts and computer literates.

For some time the computer industry has experienced an imbalance between the demand and availability of computer experts and literates.

The report says IT should be seen as a technology that promotes job creation. Although computerisation means, in the short term, that machines take over certain jobs, experience shows that in the long term it creates new employment opportunities.

~~"A good illustration of this is provided by the sophisticated computer applications made by banks and other financial institutions,"~~ says the report

"Computer technology and IT are inseparable components of these undertakings and have enabled them to render services which are an important support for the total economy

"As a result, the economy is in a position to maintain a level of activity which, without IT, would simply not be possible. This in turn means that certain other economic activities become possible"

Because IT will play an increasingly important part in SA's economy, there's a growing need for computer literacy of the population as a whole

Some components of the strategy to be taken include a programme to apply IT as an instructional aid in formal and non-formal education, including manpower training.

"By the year 2000, all school-leavers must be functionally computer literate from Standard Seven," says the report.

Factors seen as critical for achieving these objectives include allocating IT to a ministerial portfolio

Various target dates to start certain programmes are given in the report

January 1992 and December 1993 are chosen as months to launch a plan for the promotion and use of computer-assisted instruction (CAI) in formal school education.



# Giving students what they need

8/10/91  
THE Private Sector Education Council (Prisec), an independent body set up in April last year with Sacob as a founding member, has had great success in making inputs to government.

It has also been recognised as an authoritative spokesman on education, says Prisec secretary Gerrie Bezuidenhout.

Prisec represents various employer organisations which felt a need to present a united front to government in setting out what they require from the education system.

"It is a way of influencing government's education policy," says Bezuidenhout.

"Individual private sector bodies have for years been concerned with and frustrated by the inability of the education system to

produce sufficient pupils and students who have life and work skills that enable them to be employed or to create employment for themselves and others"

There is a shortage of skilled technological and technical and commercially orientated people and management staff, he says.

Prisec aims to work constructively, creatively, positively and pragmatically for an education system that is non-racial, non-sexist, unified, and decentralised; that is legitimate, appropriate and affordable; that gives pupils and students life and work skills that enable them to be employed, and that gives the private sector as well as other interest groups and stake holders the right to be consulted about the goals, content, processes and

structures of education.

"Our mission is to be actively involved in the ongoing development of a non-racial, relevant and legitimate national education system which will encourage optimum economic growth and equip each user to cope with the responsibilities of life in a democratic society," Bezuidenhout says.

Prisec member organisations include the Afrikaanse Handelsinstituut, the Building Industries Federation of SA, the Chamber of Mines, the Steel and Engineering Industries Federation of SA, and Sacob.

Each member organisation is represented on Prisec by two people and the chairman is currently Toyota SA personnel and

149A  
industrial relations director Theo van den Bergh.

He is also active in the Afrikaanse Handelsinstituut and Sacob.

Prisec was the only non-government organisation to make representations to the Department of National Education regarding its education renewal strategy, Bezuidenhout says.

"The aim of the investigation is to change the education system to eliminate inefficiency and to more adequately address the needs of the country."

Currently, Prisec is looking at government's national training strategy and, after input from its members, will make a submission that will hopefully sway government to considering the needs of the private sector when formulating a new policy, he says.

# CSIR takes aggressive steps deeper into Africa

179A  
B(Day) 17/10/91  
SEAN VAN ZYL

GOVERNMENT's scientific and industrial technology organisation, the CSIR, has embarked on an aggressive African expansion programme now that political attitudes towards SA have started to thaw

Although the CSIR has been indirectly involved in southern Africa over the past two years through exported technology, the organisation was now marketing its management and technical services directly as far north as the Ivory Coast, Africa business development manager Loic Desselas said in an interview this week.

Desselas said most of the infrastructural development projects which the CSIR had targeted were of more than R10m and normally involved international funding. He added the CSIR was involved with a road-upgrading project in Malawi, which had been financed by the World Bank

Although competition for African development projects was fierce between US and European technology developers, Desselas said the CSIR was ideally placed "as the organisation has been involved with developing and adapting technology for Third World conditions for years"

The CSIR was formed specifically to develop technology to suite African conditions

"The First World technology available from overseas developers often exceeds the needs and financial resources of developing African countries"

Citing a case in point, Desselas said the CSIR recently adapted a solar cell system which could be used for cheap irrigation, among other things

He noted the CSIR's annual budget of R400m accounted for roughly 25% of Africa's total research expenditure a year. The CSIR had the largest permanent research centre on the continent

Although the organisation's revenue generated from Africa was "very modest", Desselas noted the groundwork of establishing contact with African countries and financing institutions like the World Bank was now in place

As a result, he expected demand for the CSIR's services to increase dramatically in coming years

## Efforts

"The number of official African representatives who have approached the CSIR this year has more than quadrupled"

Desselas noted CSIR's marketing efforts were also opening up business opportunities in Africa for SA manufacturing companies. He added the CSIR only developed and marketed technology, and left the production to outside manufacturers.

"The CSIR is also looking to joint projects with local and outside private firms to manufacture developed equipment."

He added the Africa expansion programme was in line with a general reorganisation of the CSIR to that of a market-driven operation

Once fully funded by government, roughly 55% of the CSIR's annual budget was now self-generated



# Business must get cracking, or disgrace Africa

8/10/91

(179A)

LIKE Rip van Winkle, SA is now waking up after a long sleep. We are finding our way back into the world, which changed while we were away.

The birth of the "new world order" involves not just nations, but industries and companies too. A massive shake-out is under way and nothing will ever be the same again. Politics, society and economics have become inextricably interwoven, and all are now in the throes of a seminal transformation. Yesterday's winning strategies are almost instantly obsolete. There is no such thing as a sustainable competitive advantage.

Today, economics drives politics. It takes serious money to wage a war. The knowledge that drags a country up by its bootstraps is also costly. So the world's rich get richer and more powerful, while the poor multiply and cry for an equal say. Technology has made the world a global marketplace for ideas, for goods and services, and for labour. It's a jungle out there. Competitors are prepared to fight to the death for capital, market share and profits. The closing decade of the 20th cen-

18/10/91

tury will be marked as much by a new level of co-operation between nations as by the intensity of competition between companies. Both these changes threaten the economy of the new SA.

The first is problematic because while countries once struck deals with each other to gain political clout, they now do it for access to each other's markets or labour. And SA is neither a particularly exciting market nor a competitive source of labour.

The second — inter-firm competition — is a danger because SA has few companies that can claim to be world-class competitors. Years of isolation have channelled our energies inwards rather than outwards.

Factors which make a nation competitive — a stable socio-political environment, access to capital, low interest rates, low inflation, skilled labour, high productivity — are the very ones that currently cripple us. We have to get the economy moving to rectify all of them, yet we cannot fix the economy until these critical issues are attended to. Unfortunately, some of the steps

## TONY MANNING

that will be necessary will be very painful. Businessmen and politicians will find them hard to live with, but both groups are in the same boat and it's sinking fast under the weight of social demands.

Three issues — the role of the conglomerates, affirmative action, and the question of jobs versus automation — demand special attention. They affect seriously our competitiveness.

There is no doubt that the conglomerates have suppressed competition in local industries. But as government protection is removed they will feel the heat. Foreign competition will force them to sharpen up and hold down prices.

SA needs its business giants. It is impossible to compete in a growing number of industries except on a global scale. (For example, it costs around \$100m to bring a major consumer product to market, \$250m to launch a new pharmaceutical prod-

uct, and \$1bn to launch a new motor car.) Also, these firms provide plenty of jobs and put a fortune back into society in a variety of ways.

The second issue, affirmative action, is central to the redistribution of opportunities and wealth. But for decades to come, its single greatest achievement will be to blunt our competitiveness. There is no way to turn a 55% illiterate workforce into a world-class skilled force. Nor can any firm afford the passengers who will have to be carried if strategies like mentoring are adopted.

And that brings us to the toughest issue of them all: whether to create jobs or to replace people with machines. Quite clearly, we need to employ as many people as possible at the highest possible wages. But in almost every industry today firms go "bodyshopping" — using communications technology to buy the best skills at the lowest prices.

Japan exports 30 factories a week in search of a labour advantage. Taiwan is being forced to follow. The average manufacturing worker there earns about \$600 a month. But

in Jakarta, the minimum factory wage is just \$42 a month, including an allowance for food and transport. In Shanghai only one worker in 10 earns as much as \$1 a day.

But even with access to cheap labour, automation is essential for competitiveness in many industries. New technologies enable manufacturers to turn out extremely short runs of high-quality customised products. So the unkind reality is that many SA firms will have to destroy jobs in the short-term if the economy as a whole is to grow.

SA is poised on a knife edge. Yet our competitiveness is being compromised by the power games of politicians and labour leaders. And there is a dangerous level of complacency among businessmen.

We are late into the race to become world-class. Other countries and companies are sprinting into the future while we are stuck in the starting blocks. If we don't get moving, we will disgrace all of Africa. For if we cannot do it, no one can.

□ Manning is an independent management consultant and author.

## LETTERS

THE industrial relations function within organisations needs to become proactive in order to deal more effectively with South Africa's changing labour market, says Graham Bath, managing director of Educos HR Systems

Mr Bath says IR managers are usually forced to react to industrial action which appears to come without warning. "However, when the conflict is

## Early warning on labour trouble

traced back to its source, it's often revealed that industrial action had been looming for some time," he said.

He notes that small warnings of industrial action often go unheeded because they are seen in isolation rather than as a trend. "To address this problem,

Educos has developed a Human Resources System which assists IR managers to identify potential flashpoints in the organisation, thus allowing them to take preventive action."

Approved by the CSIR, Educoc was developed over nine years at a cost of several million rand

"Records of disciplinary actions taken against any employee can be noted, ranging from warnings for being late to complaints against a superior regarding racism or sexism. Recurrent problems within a department or concerning an individual employee can thus be identified by the soft-

ware," he said. The system highlights problems within departments such as high staff turnover and absenteeism and also pinpoints high amounts of sick leave taken within one region, division or department.

Educos enables the IR or personnel manager to identify problems, and places them in a position to look for a solution.



# Newspapers are embracing the new technology

310924/10/91

20/9/91 149A

SINCE the launch of M-Net five years ago, South Africa's major newspaper groups have been expanding into the electronic media.

Nearly all of SA's newspaper groups have shareholdings in Electronic Media Network Holdings, which controls 78,8% of the JSE-listed M-Net

According to McGregors Online Information, Nasionale Pers (Naspers) holds 32%, Times Media Limited (TML) and the Argus Group 23% each, Perskor 15% and Dispatch Media and the Natal Witness 2,5% each

Since the M-Net launch, newspapers groups have seen themselves as information or communication groups rather than print media groups

TML GM operations Neil Jacobsohn says the international trend is for newspaper groups to have interests in the electronic media, and some groups run a newspaper, a TV station and a radio station out of the same newsroom.

Apart from its involvement with M-Net, TML has formed a partnership with Ivor Jones, Roy & Co to form Intelligent Network (I-Net), which provides a real-time and historical financial information service

It has also formed a partnership with M-Net and TSI to form Trade-Net, which is involved in electronic tendering

Its latest venture is the formation of Call-Net, a premium rate telephone service

"Our interest in technology remains high," he says.

TML made a decision that, while newspapers and magazines are its core businesses, it is a vendor of quality information

In line with this philosophy, it will continue to pursue developments in electronic communications

TML also has a shareholding in Radio 702, which was a deliberate investment in terms of the company's mission, he says

Naspers director Her-

man Morkel says his group has been involved in building up electronic data bases.

It is also looking at producing an electronic newspaper in which electronic data can be downloaded to a decoder and transmitted through M-Net.

Naspers was responsible for the development of editorial programme Mentor following the disinvestment from SA of Atex

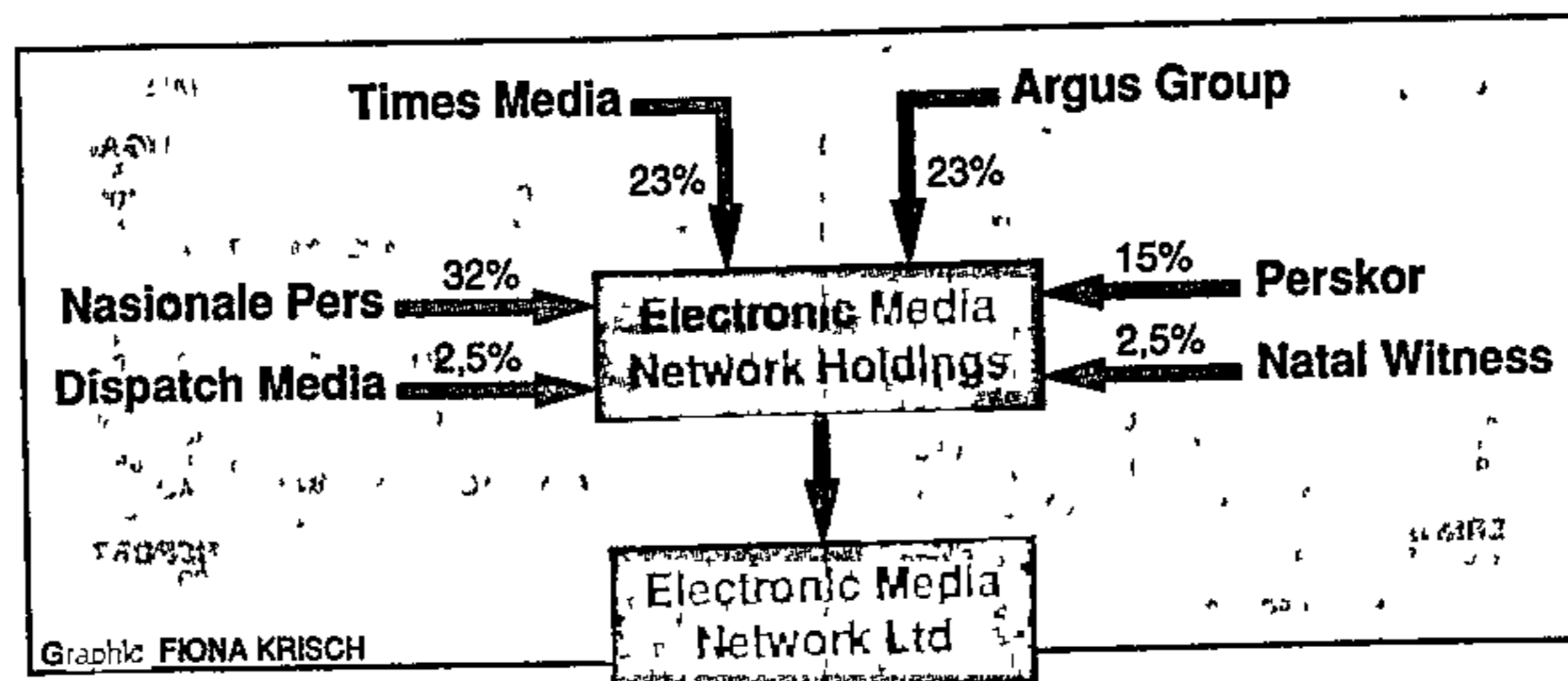
It is also jointly involved with the Argus group in Parrott publications, which is involved in premium rate telephone services

Argus CE Doug Band says the thrust of Argus' involvement is its 23% shareholding in M-Net

It is also involved in Parrott, in the audiotex market and in competition with Call-Net

Band says "We see ourselves not as a newspaper, but as a media group"

The group's involvement in the electronic media is substantial, especially in terms of M-Net



# Technology to set the pace

Monday 25/10/71

GERALD REILLY

PRETORIA — SA's economic welfare would be increasingly determined, particularly in manufacturing, by its technological capability, says CSIR president Brian Clark

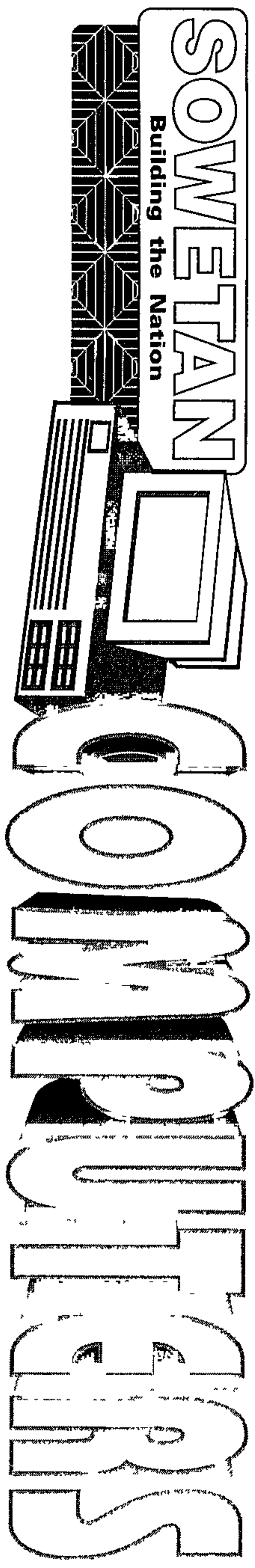
He told a Pretoria science and technology conference, organised by the SA Akademie vir Wetenskap en Kuns, that in contrast with leading countries SA's real growth in research and development expenditure and the busi-

ness sector's contribution was small (179A)

Clark said scientific and technological manpower utilisation in SA fluctuated considerably and was increasingly hindered by lack of recruits from the largest section of manpower

Poor images of careers in science and technology and a lack of preparation for tertiary study were further shortcomings.





By SHARON  
ROSTERBERG of the  
Applied Learning  
Centre in  
Johannesburg

Computers - much less mysterious than we think, much easier to use than we thought, much more useful than we imagined!

Getting things done in today's world is not so much a matter of bending our backs as bending our fingers. Putting our nose called "fingers to the keys".

Computers have become important to almost everyone in every part of society. They are seen in offices, factories, shops, and even buses and cars. With the fax machine and the telephone they are changing the way we get things done and the way many of us earn our livings.

Today the most important question for a secretary is not her shorthand speed but whether she can use a Word Processor. Other office staff job adverts mention Database or spreadsheet abilities.

# Computers and

# how they work

Sowetan 29/10/91

1499A

What are these programs for a new appliance? Programmes are manuals just like that, but for the machine. They contain the instructions on how to do something which we used to have to do manually.

Another way of looking at programmes is as taped instructions. We record what someone, perhaps ourselves, said and then we "play it back". The recording reproduces what was said and we can follow the instructions again.

So programmes are for "play back" (or "running") in the machine's language, to make it do something we need done, except that through electronic magic the machine does it for us.

can make it work for us.

The first computers were also driven by punched cards. Some had holes (instructions) like a knitting machine card and others contained the information on which the work was to be performed.

### Cards

Although we might be fascinated by this seeming marvel we will buy the machine and take it home, full of confidence that we

Later on we got smarter and instead of punching instructions into cards we recorded them on magnetic tapes.

Instead of using the card

Now, imagine writing instructions for someone else on how to fill in some forms. Imagine also that the person has very little idea of forms or any other document.

### Cards

You will probably have to explain in a lot of detail and get your instructions in the right order or they will not succeed. Imagine then that you spread the instructions out on a desk. How much space would you need?

come to about 4 000 characters per page, including spaces

Imagine you needed 20 pages to hold all the instructions. The total would then be 80 000 characters

### Disk

What is a kilometre? It is 1 000 metres, so "kilo" means 1 000. Perhaps you say to a friend: "I got a ticket because I was doing 140 K's." So we just said that you need a desk of 80 "K's" to hold all your instructions

As a matter of interest a normal office desk top will hold about 36 000 typed characters (or 36 K's). The usual office PC has a memory (RAM) of 640 K's. This means it can hold about 17 desks worth of instructions

To go back to the "floppies" and "hard disks" We record our instructions or programmes on these devices and the obvious question is how many instructions can we store on disks.

Firstly we use a word - "byte". Think of this as meaning a character like "a". The expression, mega-something, means one million of those somethings. We measure the capacity of disks this way, 20 megabytes being about 20 million characters.

### Disk

A normal office PC has a hard disk of about 32 megabytes. Going on the estimate of some 4 000 characters per page, this means such a disk can hold about 8 000 pages of instructions. That is an awful lot of office procedure manuals.

Disks are where we store instructions (programmes) for repeated use. RAM is where we put them when we use them. A normal office PC will hold about 8 000 pages of instructions (on disk) and can provide "17 desks" of space for reading them in RAM (desk space).

## Disks are where we store instructions

"Can you read, write and do arithmetic?" has changed to "Can you use a computer?"

What all this means is that many of us either want to (or have to) learn to use and benefit from computers.

Unfortunately computers have entered our world so quickly that they have not had the time to enter our classrooms or lecture halls.

### Lucky

Almost everyone working for a living today has learned on the job or been lucky enough to be "sent on course" by their employer.

The emphasis which overshadows all of us is to get on with getting the job done without a chance to understand what this computer is and how it can fit into our working and private lives.

In this series of articles the computer will be explained by relating it to other more familiar things, such as paper and pencil, typewriter and filing cabinet, telephone and calculator.

In seeing that it has many possible uses and how and why it can do all these things, we will be able to relate it to ourselves and our working lives much more easily than we perhaps do now.

To begin with, the many serious "programmes" that people write and that others "load" or "run" are actually not mysterious at all.

Which of us has not read an office procedure

The wonderful thing about computers is that they can "play back" lots of different kinds of instructions. How to format and print a letter (word processing), how to fill in a form and file it away or get it back (data base), how to list and calculate numbers (spreadsheets), and so on for many, many other things.

The good part of this is that if we learn how to use this one machine we will be able to do much more than just one job.

### The Personal Computer (PC)

There are two important parts of a PC. One is the storage in which instructions are kept.

This is a computer form of tape recorder which uses round disks instead of tapes. The ones you can remove are called "floppies" and the ones built into the machine are called "hard disks".

We use them exactly like we use the common tape recorder. The other important part is the storage in which the instructions presently being carried out are kept. This is called "random access memory" or RAM.

### Memory

The word memory is used because it is a bit like our memories where we recall how to do something. Instructions are "loaded" from disk into RAM. Another way of saying this is "running" the programme. Think of carrying out a "progress" of activities to get something done.



## INFORMATION TECHNOLOGY

# Future of technological investment considered

B'IDCJ 31/10/91.

149A

Reports by  
**MELANIE SERGEANT**

THE performance of any country's economy and the level and extent of the technology used are interwoven and often cannot be separated

At yesterday's Fedgas seminar on technology and the economy in the '90s, Econometrix director Tony Twine studied the effect of fixed investment in technology under the political scenarios of socialism and free enterprise.

"Although increasing levels of socialism could provide stimulated growth and fixed investment during the first half of the '90s, experience has shown elsewhere that the ultimate growth potential ... is extremely limited.

"During the second half of the decade, growth slows down markedly

"In the free enterprise scenario, disruptions caused by deregulation severely hamper growth during the first five years of

the decade, but overall growth for economic production and fixed investment is substantially improved during the last five years," he said

New technological breakthroughs could substantially alter prospects for the mining industry, but neither economic scenario gave much hope for a simple continuation of sales of the same type of technology that had existed over the past two decades

With probable increased urbanisation, the utility sector tended to grow fast under both scenarios, so there would be a sharp increase in demand for technology to provide electricity and water

But Twine said, "Beware of relying on the mining and manufacturing sectors as the happy hunting grounds for technology

sales SA has a skewed recent history as far as fixed investment spending is concerned This is because of political factors, as well as the frequent recourse to negative real interest rates since the '70s

"If current Reserve Bank policy is maintained, there is small chance of the economy seeing negative real interest rates again Hopefully this should be in a political environment which does not call for fixed investment and technological extravagances such as Moss gas and Sasol

"People planning on selling technology into this kind of environment in the near future are likely to be out of business before long"

Econometric models showed that under the socialist scenario, fixed investment growth by the utility sector (electricity, gas and water) grew at 6,1% a year, construction at 5,5% and the financial sec-

tor at 6,86% Mining and manufacturing showed negative compound growth at -4% a year and -1,07% a year respectively

Under the free enterprise scenario, sectors showing strongest growth over the decade were utilities (10,9% a year), construction (6,43%) and the financial sector at 7,77%

Big losers were the mining sector at -3,28% and social and community services at -0,47%

He said that a well-considered view tended to favour the evolution of the socialist scenario "However, the free enterprise scenario is not unattainable"

# Bosses threaten mechanisation

Sowetan

8/11/91

179A  
By JOE MDHLELA

EMPLOYERS may consider using machinery than people if the strikes continue at the prevailing rate, a spokesman for the South African Chamber of Business, Mr Gerrie Bezuidenhout, said yesterday

Bezuidenhout was reacting to the two-day national strike organised by the anti-VAT Co-ordinating Committee. By mechanising jobs it was possible that less employment opportunities would be created, he explained

Figures varying from 80 to 100 percent were given as representing workforce that took part in the stayaway on Monday and Tuesday.

Organisers regarded the strike action as a huge success, a show of strength which kept more than 3 million workers away from the work-place.

Bezuidenhout said workers in the private sector lost more than R200 million in wages over two days

"This figure negates to a very large extent any potential burden that may have been imposed on workers by the introduction of VAT," Bezuidenhout said.

He said by making contingency plans the private sector has demonstrated its capacity to maintain a reasonable level of activity despite the incidence of absenteeism

Bezuidenhout said employers would in future step up efficiency and stop relying on the abundance of labour.



(179A) New Nation (Learning Nation) 15/11 - 21/11/91

# Careers, Skills and Development

In our last article we looked at the divisions in society between mental and manual labour. We noted that these divisions take on a particular form within the class structure of capitalist society. We raised the fact that the struggle to give the same value to mental and manual labour has been an important part of the struggle for real equality in all countries. When we speak about careers we should therefore be aware that all kinds of jobs are necessary and that no job should be regarded as elite.

For South Africa to provide for all its people in the future we will have to increase the level of skills of all the people. This will include the elitist "professions" such as teachers, computer technicians and engineers as well as the skills of workers involved in production. In the liberation movement there is some debate over the relation between careers and skills and how these relate to economic development. This article will look at these relations so that we can begin to see how the choices we make about our career paths and the struggle to improve our skills are not just for our individual interest but play a role in shaping South Africa's future

## The need for more skills in South Africa

The legacy of apartheid capitalism has left South Africa seriously lacking in the skills required for all aspects of production and administration of services. Capitalism developed in this country on the basis of cheap labour and through the export of primary commodities such as gold and farm produce. The black working class who provided this cheap labour received little education and were largely confined to unskilled work. It was only with the growth of secondary industry during and after World War 2 that the state attempted to address the need for mass education to satisfy the demands of manufacture. But the scheme they came up with - Bantu Education - still operated on the premise that black people were largely to work on the basis of commands, and in jobs which were routine and repetitive. Towards the end of the 1960's, as South African industry became monopolised and concentrated, this legacy of using cheap black labour began to be experienced as a "skills crisis". Out of self-interest the bosses began raising the need for upgrading skills amongst black South Africans and calling for more schooling and for technical education and vocational guidance.

The economic crisis of the late 1970's and 80's and the heightened struggles of this period have however made the bosses reluctant to invest in large-scale projects, and they have hoarded their money or invested overseas. This has meant that there has still been no serious attempt by the bosses or the state to see to upgrading the level of skills on a mass programmed

basis for the workers of SA. The collapse of effective schooling after the state crushed the school-based uprising of 1984-'86 has also meant that even Bantu education is no longer delivering a generation of semi-skilled youth.

A feature of the current capitalist crisis in South Africa is the fact that, while not opening up new plants, the bosses are buying more machinery and reducing the size of the workforce. South Africa has one of the highest capital - labour ratios in the world. This means high unemployment and retrenchments. At the same time the bosses are employing more and more casual labour instead of workers that work full-time. The result is that only a few workers are able to get work, and then only those who are skilled, whilst the majority of workers do not acquire skills let alone employment.

## Production Trends in Other Countries

The world of work has change a lot over the last 30 years. Because of the strength of the working class and their unions in the larger capitalist countries, by the 1960's, profit rates had dropped. In order to defeat the organised strength of the working class, the bosses in countries such as Italy, Japan and Germany changed factory production quite considerably. Their strategy involved breaking up the old conveyor-belt system under which most factory production took place. Under the conveyor belt system, called Taylorism, workers worked in huge factories on specific tasks and on specific parts of a final commodity. From the viewpoint of the bosses this method was originally very efficient and kept the workers under the strict control of the factory's conveyor belt. Workers were de-skilled and had little interest in the outcome of their labour.

On the other hand this concentration of workers in the factories brought about a consciousness of common oppression and built a sense of fighting solidarity. Union organisation was relatively easy because workers were gathered together in such large numbers and felt little commitment to the bosses. These conditions led to large trade unions and many strikes in the 1960's and early 1970's which put the bosses on the defensive and made them look at ways of taming the unions.

## New production trends and technology

Since the 1980's the capitalists overseas have changed their strategy. The key to this new strategy was to break up the unions by breaking up the old conveyor-belt factory production. Instead they have come up with a new approach to production by getting workers to work in small, highly-skilled work-teams. These workteams virtually produce the whole commodity. In the case of cars, to use an example, a workteam will make a complete engine whilst another team makes a body. To keep the two workteams synchronised a computer will ensure that the two groups work at an appropriate pace and to an exact degree of accuracy so that the engines fit the bodies exactly - all this without working on the same conveyor-belt! By this method different teams can work in different regions and even different countries without having to stockpile car parts.

The use of computer technology within this small-team production cuts down on the number of fully-employed workers, as well as eliminating storage-time and wastage.

The fact that workers work in teams and on a complete unit makes them feel responsible for the product and therefore motivated to work harder. This incentive

to work harder is increased by the fact that the bosses pay piece-rates (according to how many products the workers produce) rather than a fixed wage. While this strategy has largely been used to divide workers and destroy their unions, the level of skills obtained by workers and the efficiency attained mean that these bosses can outsell their competitors.

This use of advanced technology in production makes it important that all workers increase their technological knowledge even while resisting the union-bashing strategies of the bosses. For workers to struggle over the right to acquire skills and control over technology will increase their ability to resist the strategies of the bosses. A truly democratic South Africa will also need to have a working class with a high level of all-round skills especially those relevant to new technologies.

All of this makes the developing of skills a task to be taken up by the mass movement. The struggle for a career is both a personal struggle for the individuals concerned, as well as a general struggle for South Africa, to have the resources to determine its choice for economic development.

Next week we will look at how changes in the economy have affected various jobs in South Africa.



Spur 15/11/79

## UK trade minister offers words of encouragement

By Frank Jeans



Timothy Sainsbury . . . fetters to mainstream without delay

Export credit for British businessmen looking to the South African market would soon be cheaper, the UK Minister of Trade, Timothy Sainsbury, said on arrival in Johannesburg yesterday.

At a luncheon of the SA Britain Trade Association (Sabrita), he gave encouraging pointers to renewal of trade and investment links between the two countries

"SA must return to the mainstream of world trade without delay. Planning for the future cannot wait for a political settlement."

Mr Sainsbury, the first British trade minister to visit SA in 21 years, has come to explore new opportunities for trade and investment. He assured businessmen of a further surge of interest in the SA market.

"Here as in Britain, business has a heavy responsibility to help develop imaginative schemes and

all other ways of realising the rich potential of South Africa's young people," said Mr Sainsbury.

While emphasising that SA had a sound economic infrastructure on which to build and that in some sectors its industry was fully competitive internationally, he criticised some areas of local business practice.

"In some sectors your technology has become dated, your manufacturing methods need reappraisal and training systems need overhaul," he said.



B(Daw) 20/11/91. 149A

# SA, Soviets agree to scientific deal

PRETORIA — An agreement to improve co-operation between the SA and Soviet scientific communities has been signed by top representatives of the Soviet Academy of Sciences and the Foundation for Research Development (FRD) of SA.

Vice president of the Soviet Academy Konstantin Frolov signed on behalf of the presidium of the academy in a ceremony at Jan Smuts airport at the weekend.

The FRD was represented by its president Reinhardt Arndt.

"This was a substantial breakthrough which will open many doors in the Soviet Union to South African scientists and engineers to the benefit of both countries," Arndt said yesterday.

Frolov met chairmen and presidents of research councils, high ranking government officials and directors of national research facilities during the past week.

An FRD spokesman said that in addition to the field of earth sciences, where col-

GERALD REILLY

laboration between SA and the Soviet Union already exists, new fields had been identified for co-operation, including biotechnology, conversion technology, safety aspects of large engineering operations and nuclear reactors, the study of natural disasters and their impact on populations and the environment, and outer space exploration.

Ways of launching the co-operative programme would include study visits for individuals, exchange of scientific and technological personnel and the exchange of students at advanced levels of post-graduate study.

An FRD newsletter will go to the Academy in Moscow in early 1992. It will be translated into Russian and electronically distributed to reach an estimated 3-million Russian scientists, technologists and engineers. A newsletter from the academy will be distributed to SA experts.

# Doubts on IT's cost benefits

THE cost benefits of information technology (IT) are being questioned the world over; more companies are asking about the real rewards reaped from spending on computers

At an executive briefing at the Aitec South Southern Africa Computer Expo in Harare last week, Shell SA's information and computing services MD Laurie Mutch said companies feel IT costs too much and does not work

An analysis of European multinationals over the past four years showed business growth was 5% a year and staff numbers decreased by 5% a year, but IT expenditure increased by 50% a year. The amount of processing power escalated by 30% to 40% a year on average, so it was no wonder companies raised eyebrows about returns *(S/Day 2/11/91)*.

"Queries are even more justified against the backdrop that over the last five years unit costs for IT have dropped by some 80% "

He said that since — and perhaps because of — the PC's introduction, white collar worker productivity in the US had declined "Reasons for this are that PCs are used to generate more irrelevant information, leading to information overload. Also, some companies use computers to automate bad administration and other company systems. Thus they simply cement the old way of performing tasks instead of making themselves more efficient through technology."

Reports by  
MELANIE SERGEANT

Mutch argued that companies often expected too much from IT "They expect IT to sort out fundamental management problems, and may spend money on useless PC terminals"

"Too often, they are taken in by computer companies selling hardware and software and which don't lay enough emphasis on the holistic approach, they may computerise one area like accounting, but forget how this integrates with the entire business operation"

"Also, IT spenders worry too much about costs and too little about spending the right amount of time implementing the systems and ensuring they reap benefits"

Steps which can be taken to ensure better cost to benefit ratios include

- Making IT investments a business line management responsibility,
- IT requirements and resources must be developed as part of the overall business plan,
- IT investments should be screened like any other company investments, and
- IT staff must have performance appraisal tools available for examining benefits or problems

Looking at smaller companies in Africa, delegates felt Mutch's views were sometimes inappropriate. Smaller companies are squeezed between having no professional IT staff and being at the mercy of computer vendors

A solution for these problems, said Computer Society of SA vice-president Chris Guy, was to seek objective advice from other users and special interest groups

"Too many small companies are rushed into deals and seduced by technology, it's sensible to decide on systems needed before taking the plunge"

Other major discussion points at the conference included the future of the 10-year-old MS Dos operating system

Marketing director of Zimbabwe-based Infotech, John Davidson, said the past year had seen an unprecedented number of mergers and alliances, as well as link-ups to develop new chip technology

George Wells of Rhodes University's computer science department said it would be in users' interests to watch groupings, and to ensure they stick to open systems standards, because this was the best way to protect their computer investments

Johannesburg-based Workgroup Systems MD Dana Buys told the conference that Microsoft's stated direction was for Windows at the lower end, and Windows new technology for higher-level machines "Microsoft will probably give IBM a run for its money in the higher-end server market," he said

Developers' kits for the new technology were shipped a month ago, and more than 7-million copies of Windows 3 have already been sold

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# Research, development 'must be restructured'

15/12/91  
MATTHEW CURTIN

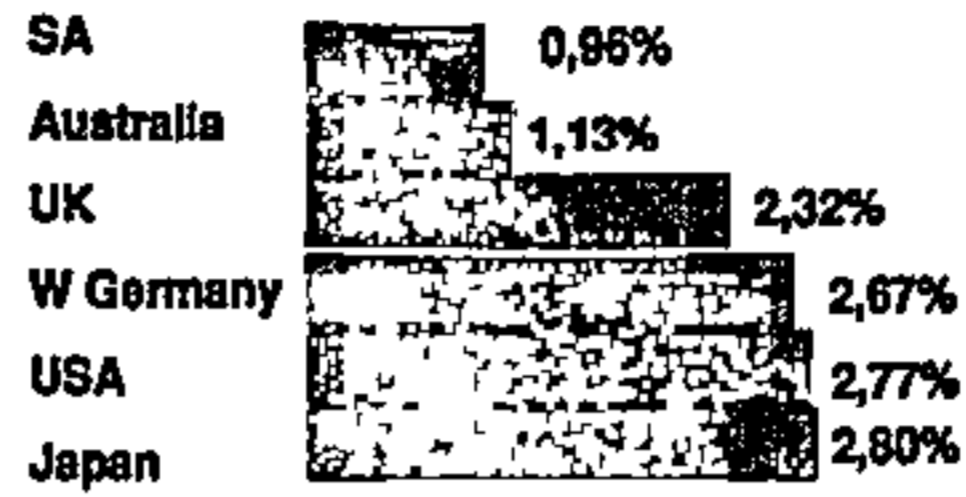
SA HAS to restructure its scientific research and development resources if it is to make best use of them, says former Mintek director general Robbie Robertson

In a recent address, Robertson said the main problems facing SA's research capability were its small size and the difficulty of maintaining research groups of "critical mass".

SA's spending on research and development in 1990 was R1,6bn, compared with Japan's Toyota motor corporation's expenditure of R9,3bn. Toyota employed five times as many researchers as SA.

Robertson said SA could not hope to compete in popular high profile

## Comparative domestic research & development expenditure



research fields such as energy, biotechnology and micro-electronics.

A concerted research and development strategy was crucial. Research had to be managed in an innovative and commercially oriented way.

In this country, research oper-

ations should be reorganised through co-operation between industry, the universities and statutory organisations. Areas of priority such as agriculture, mining and minerals processing, water availability and purity, and the environment needed to be targeted. (179A)

In planning and evaluating the results of research and development at the company level, poor accounting was often at the root of so-called unprofitable research. The contribution of research to market successes was often not recognised.

Similarly, projects were undertaken nationally which did not address the needs of the country, or were incompatible with its financial, technical and manpower capabilities.

# Technical skills are key to jobs - expert

Sowetan 13/12/91

179A



By PHANGISILE MTSHALI

**ACQUIRING** technical skills was the best hope for school leavers to finding and keeping jobs, Mr David Kramer, executive director of Protec, said yesterday.

This follows predictions that only a tenth of 1991 matriculants will get employment.

Kramer said it was a cruel paradox that only 40 per cent of South Africa's employable population could not find work in the formal sector while employees were "crying out for workers with technological skills"

"Of the more than 14 million people wanting to work, only eight million actually have jobs," he said.

"This means more than 40 percent of our economically active population are job-seekers, with little hope of finding employment.

"By the end of the century South Africa will have almost a million fewer skilled workers than the economy will need. There is no question that a school leaver's best hope for finding and keeping work is to offer technical skills."

Kramer said South Africa's failure to produce an adequate supply of technologically competent people had had a severe impact on the country's economy same as sanctions, disinvestment and lack of confidence.

"While there is little we can do for school leavers of the last five years who are not technologically handicapped, it is imperative we teach the next generation to make themselves employable by taking correct crucial decisions when they are in Standard 7 or 8," Kramer said.

"We must teach them to invest in mathematics and science, as this will ensure them a competitive edge when they leave school."

To guide the youngster he suggested:

- \* Career counselling, visits to career centres and analysing and discussing job advertisements so that they understand what employers want
- \* Encouraging tertiary study in technical fields, at technikons rather than at universities.
- \* Encouraging pupils to take maths and science for matric, thereby ensuring their future employment prospects improve a thousand-fold.
- \* Encouraging pupils to enter apprenticeships, as employment prospects for artisans are as good as for university graduates.
- \* School leavers should seek employment in technical areas which afford further training opportunities even though initial salaries or wages may be low.
- \* Enrolling in skills training programmes which they can afford



# Fewer degrees in science - survey

*Sowetan 27/12/91*  
THOUGH there is a distinct move towards technical and vocational study, most degrees awarded at universities continue to be in the arts, social science and education fields

According to the South African Institute of Race Relations' latest *Social and Economic Update*, from 1986 to 1990 enrolments at technikons increased by 258,2 percent, while university enrolments increased by 54,5 percent

By contrast, between 1975 and 1979, student enrolments in technikons grew by 14,5 percent and university enrolments by 54 percent

Other research conducted by the institute shows that of the degrees awarded at South African universities in 1989, 60 percent were in arts, social science and education, only 13 percent in science and engineering and 9 percent in medicine

The country is still producing too few technicians and more academically oriented graduates than it can absorb

Update notes that the Government, through its Education Renewal Strategy, has recommended an investigation into the possibility of setting further restrictions on

*149A*  
admissions to universities

The Department of Education and Training has committed itself to overcoming backlogs in the provision of textbooks, and has allocated R61,1 million for books in the current year, with another allocation of R69,7 million for books in the 1992 school year

In its health and welfare section, Update points out that another 45 000 places in children's home would need to be provided for African children in order to achieve parity with accommodation provided for white children

Some R34,7 million was spent on 5 075 white children and R5,7 million on 1 257 African children, representing expenditure of R6 837 a white child and R4 535 an African child

Update reports a growing incidence of tuberculosis, which has shown scarcely any decline in 26 years

An official report of the Department of National Health and Population Development states that in 1988 there were 57 704 cases, in 1989, 68 075 and in 1990 a provisional figure of 65 435 was given - Sapa

# MANPOWER - TECHNOLOGICAL CHANGE

1992



STAR 2/11/92 (179A)

# T & N strengthens international links

By David Canning

T & N Holdings' South African operations are to be more closely integrated into the group's worldwide infrastructure, with the announcement that top Durban executive Mr MC Pretorius is to take up a new appointment as deputy chairman, reporting to London-based chairman Colin Hope

At the same time, T & N says 1991 group results "have shown satisfactory improvements over 1990" It expects 1992 results to reflect greater success

Mr Pretorius's appointment is one of several changes in the SA management structure designed "to take advantage of opportunities opening up to South Africa"

Mr Hope says the changes also are designed to develop strengths "on a worldwide basis", and to use the international infrastructure to best advantage

In this respect, he has appointed product chief executives who are responsible for developing international strategies in respect of technology, marketing and sourcing

"The new organisation structures of T & N Plc creates many opportunities for the operations in South Africa as T & N Holdings executives will contribute towards international planning of marketing, technical issues and production infrastructure in the future"

Access to all technology is open to South Africa and greater exports will become a reality much sooner.

In his new executive position Mr Pretorius "will be responsible for a range of activities which include corporate financial, external relations, acquisitions and disposals, review of major capex prior to board submission, the management of social change, international links, pensions and legal and secretarial"

— INFORMATION TECHNOLOGY —

# Absa to rationalise computer systems

179A

B/day 30/1/92

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Reports by  
MELANIE SERGEANT

ABSA's acquisition of Bankorp will lead to major rationalisation of the new group's computer systems

Most sources say it is too early to speculate on exact changes, but it will probably no longer be necessary for the group to have two large backbone network systems, two computer and network management centres, backup centres, and other dual facilities

Absa group executive of management services and technology Alwyn Burger says strategies will be formulated by Absa and Bankorp data during the next few weeks to determine changes which may be necessary

"Fortunately, Bankorp"

data and Absa mainframe technologies are predominantly IBM or IBM compatible, and we're using the same vendors, so there shouldn't be major program rewrites or other work necessary. Overall, our technology philosophies are much the same."

However, he says there will be savings in terms of not having to double up on certain services and products.

During its own restructuring, Absa did reduce staff, but Burger points out that at least two-thirds of the staff left through "natural" means — either because of normal "turnover" or by retiring

"We don't expect major staff reductions now, because the workload will remain the same."

"Essentially, we must do our homework. IT staff are highly skilled, and not a re-

source to meddle with. Major costs would be incurred if we retrenched and were then forced to re-employ, so we'll avoid reductions as much as possible in the short term," he adds.

Another source in Bankorp points out that Absa has become a master of rationalisation due to its own restructurings over recent months, so the process should be well-handled

He points out that Absa and Bankorp have already been co-operating on each other's disaster recovery systems.

"The big changes will come if it's decided to cut dual facilities such as networks, management infrastructures, mainframe sites and other computer-related systems," he adds

Bankorp data has about 650 staff, but there are also several DP staff working in TrustBank, Senbank and Bankfin



# Get computer-literate

179A

Computers, supposed to free the workplace and management, can have the opposite effect in the hands of the non-computer-literate

Yet where does the busy executive find time to learn a mix of basic computer skills?

One of the more flexible approaches to the problem is that offered by Computer Academy's special mixed 80-hour flexitime Business Computer Course offered in or out of normal business hours up until 9 pm on weekdays and 1 pm on Saturdays

A variety of computer skills are se-

lected by the student and the mix of time spent on each is open to choice up to the limit of 80 hours

The usual time spent on a specific Computer Academy course is 32 hours

Computer Academy group branch manager, Oren Rosenbaum, says "Computer education draws every age group. Our students range from a 13-year-old to an 84-year-old, and everything in between. Industry can't operate without computers so no one can really afford not to comprehend basic computer usage skills..."

STAR 30/1/92

# Trainings budgets must increase

STAR 30/1/92

In 1990, expenditure by companies on education and training, R3,8 billion, was 16,7 percent of the gross national expenditure on education (formal, non-formal and training) of R22,7 billion

Companies and individuals together make up the private sector's contribution of R8 billion and the Government's contribution amounts to 64,2 percent of the total for that year

These facts are according to research by Business and Marketing Intelligence, BMI, completed in April 1991, and was based on a sample of 300 major South African organisations BMI will update the research this year

In the training market BMI calculated an expenditure of R3 340 million. The company's conclusions are that the average R620 spent on a worker a year, according to their research, must increase about ten fold in this decade if it is to make an impact on the current skills' shortage. At present there is an undersupply of skilled workers and an oversupply of semi-skilled and unskilled job-seekers

The research report advised a further 10 to 20 percent increase in the R235 million spent on informal education

The major skills shortages in South Africa, according to the study, are in technical and general management areas and it is forecast that the manager/worker ratio could worsen to 1:8 by the year 2000 unless the training backlog is addressed

The challenge is daunting, and will probably require companies to increase training budgets as a percentage of turnover from the current 0,5 percent to as much as 5 percent at

Companies' training budgets are going to have to increase if South Africa is to develop at the required pace, say leading businessmen Susan Ramwell reports.

a time when turnover growth is virtually stagnant.

But a positive view is taken by BMI chairman Jonathan Harrod, who believes South Africa's own training resources and educational institutions are sufficient to cope with the load. In short, the only major problem is a shortage of funds.

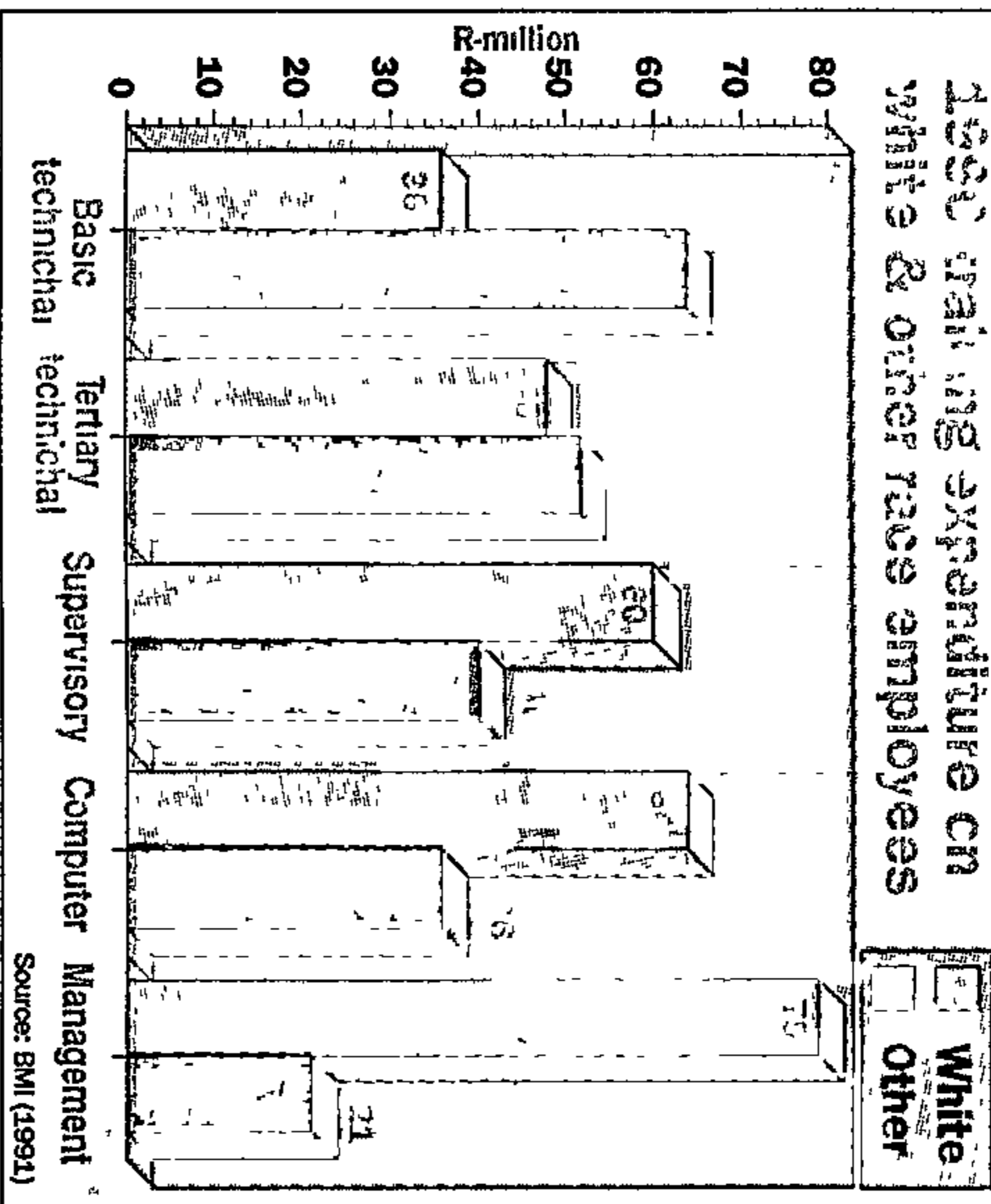
The Budget to be announced by Government in March is expected to allocate 20 percent of total expenditure to formal education (excluding contributions to TBVC countries), but the Minister of National and Environmental Affairs, Mr Louis Pienaar, has announced that this is unlikely to meet the needs of universities and technicians.

He says "Growth in student numbers exceeds the growth in the economy".

That will place additional demand on private-sector contributions to both formal and informal education and necessitate a greater burden on corporate South Africa and greater use of the wider training industry.

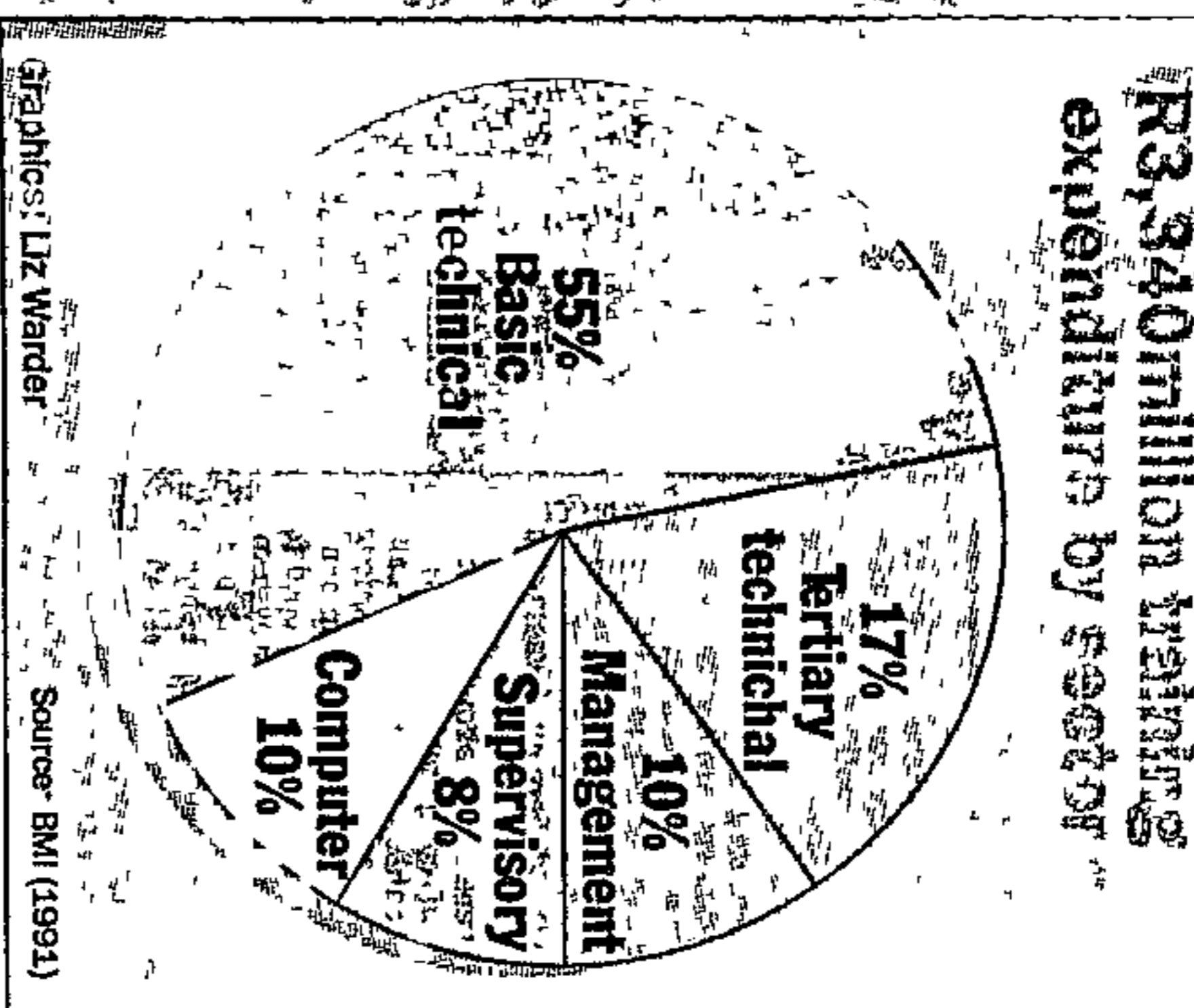
It is interesting to note that of the R235 million spent in 1990 on non-formal education (52 percent from companies and trusts, 15 percent from overseas funding and 13 percent from parents and pupils), only 5 percent of the expenditure went to management or leadership training and 6 percent on technical/tertiary education. The bulk (34 percent) went to the secondary school level, 15 percent on adult education and

1990 training expenditure on white & other race employees



Source: BMI (1991)

R3,340 million training expenditure by sector



Source: BMI (1991)

## Learning for professionals

You've heard of the one-minute manager. Here's how to adopt the "winning way" in a variety of tasks - in one morning!

- Customer Service Public Relations
- Motivation in the Business World
- Lateral Thinking for Management
- Effective Writing and Writing Skills
- Creative and Effective Presentation (presentation skills for the boardroom or for public appearances)
- Credit Control
- Advanced Time Management

13 percent on teacher training

In the view of a majority of directors of academic and training organisations, South African companies are rising to the challenge with greater recognition of the need to upgrade workforce skills

Private-sector training companies in the main report growth in demand

Most such companies offer not only packaged courses, but customised courses which can

be conducted in-house.

Considering that 82 percent of 1990's R3,3 million training expenditure was spent in-house, the training industry appears to be moving closely with market needs

Cost-effective expansion of training, however, is likely to point companies to greater use of packaged courses, and devolution of responsibility down the corporate ladder for in-house training responsibility

Keith Edmeades, managing director of training company Effective Executives and of the training trust organisation, Integrated Management South Africa, says "Companies need to become effective learning environments. Training is not the exclusive territory of the trained human resources manager alone. It should be part of the job description of all managers as a priority, not as a last resource"



# Target the market

CIP news 2/2/92  
By MPH O MAISELA

THE research community has an important role to play in the transition in South Africa, National Union of Metalworkers of South Africa (Numsa) education secretary Alec Erwin said yesterday.

Speaking at a symposium in Durban attended by some of the country's leading researchers, Erwin stressed that for South Africa to progress economically and socially it was necessary to convert its technology to meet development and growth challenges.

"South Africa is un-

likely to compete with the Pacific Rim countries - Korea, Taiwan and Singapore - in manufactured goods, unless we convert our technology and identify niche markets," said Erwin. (179A)

He also pointed out that this had to be linked to an economic growth path in South Africa and also had to address the problems of poverty which had been inherited from apartheid.

The two-day symposium, also attended by delegates from Tanzania, Uganda, Liberia, Senegal and Kenya, ends today.

Political comment and newsbills by K Sibya, headlines and sub-editing by S James, both of 2 Herb Street, Johannesburg.

# R1,5-m for STAR 14/2/92 adventurous entrepreneurs

Finance Staff

~~179A~~ 179A

Many good product ideas go to waste for lack of start-up capital.

Now the Foundation for Research Development has come up with a plan to help "entrepreneurs and innovators" turn their ideas into business ventures.

It has set aside R1,5 million, to be spread around at a maximum of R100 000 a time, for projects using innovative technology to manufacture products aimed at niche export markets while generating employment.

FRD executive director Dr Lous van Biljon says the Small Business Development Corporation has already been approached to contribute further finance to successful ventures.

The scheme, known as Idea, or the Initiative for Developing Enterprising Activities, will be launched on Monday at a symposium in Pretoria. The guest speaker will be international venture consultant Dr William Rowse.

The cost for the day is R140 and bookings can be made at (012) 841-3588.



# Lexpress takes training into the 21st century

LEXPRESS Data, a recent addition to the Mast fold, is set to take the group into the 21st century.

The company specialises in technology-based multimedia programmes for the training, education and business markets, quite unlike most training programmes seen in South Africa.

Lexpress combines the video and audio elements of TV with the text and graphics of computers to provide a hi-tech product stored in a computer, which is sent electronically to the trainee

This allows the trainee not only to interact with the programme, but also to test and score, choose parts of a course or revise certain areas from his or her own desk.

## Variety

Sales director Toby Chance says Lexpress will choose the variety of media depending on the training needed.

Some training programmes — like telephone techniques — might only require video, but text and graphics will be used in other circumstances.

Technology-based training allows for ongoing or additional training when new systems are introduced into a company.

Also, computer training can assess the results of the course and tell a trainee what sections need to be revised

Chairman Anthony Crosby says there is a necessity for "classroom" training and computer-based training.

Lexpress' training is useful in large organisations which need to train a number of people in different parts of the country.

While tutors may vary in their approach and effectiveness, this system provides a standard form where all employees can learn the same thing.

Lexpress, which started in 1982, was incorporated in 1987 when Lexicon Publishers bought a majority stake in Express Data

## Establishing

From 1987 to 1990 the company grew fivefold in sales and revenue and personnel, establishing itself as a major player in the technology-based training market.

In 1990, Lexicon decided to refocus on book publishing, and its shares in Lexpress were bought by Mast Holdings in July of that year.

Since then, Lexpress has grown from a company making losses to one where turnover and profits equal those of the other divisions.

It offers off-the-shelf packages, tailor made computer-based training and interactive video courses, depending on the need.

A major use is for large corporations, banks or insurance organisations, which can train employees nationally via their computers.

Crosby says the course for the Post Office counter staff "is the largest interactive video project ever undertaken in SA".

THE thrust of SA's economic and industrial growth path requires us to accept that it cannot rely on market forces alone in the field of research and development (R & D).

The establishment has tried to make as much research as possible depend on contracts from business and government departments. The discipline of the market clearly has a role. But R & D is one of those areas where business has shown that it cannot and will not plan for the medium or long term. The figures turned up by the Old Mutual/Nedcor scenario investigation were horrific. One of SA's biggest industrial conglomerates spends 0,12% of turnover on R & D, as opposed to an average of 6% in Japan, 3% in the US and 2% by apple growers in the Cape. To develop quickly and effectively, SA requires a balanced scientific and technological programme. To ascertain what the balance should be, let us look at possible priorities. We recently had an opportunity to speak to the Swedish National Board for Industrial and Technical Development. They made the interesting

# SA should be converting technology

B/D by S/3/92

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**BERNIE FANAROFF**

point that Sweden sees itself primarily as acquiring technology and then developing and applying it. Sweden primarily processes and converts technology. It is generally not big enough to compete head-on (with other countries) in completely new technologies, so this occurs only in limited areas.

This is relevant to SA. We would argue that we should primarily be technology converters.

What does this mean in practice? It means having the capacity, resources and will to find appropriate technologies, acquire them, understand them, be able to develop them further, be able to adapt them for our situation or for niche markets, and be able to produce marketable products. It means being able appropriately to develop and modify production processes.

Each of these points raises further priorities. In order to ensure that we

are able to do these things, we require a "technology core". In-depth human resources of skilled and motivated scientists to direct and carry out R & D and to teach and develop other scientists, engineers and technologists in properly equipped laboratories and teaching institutions.

To be able to understand new developments and to identify, evaluate and master appropriate technologies, we require a sufficient base of research and applied research. To retain outstanding scientists (among other things) there must be space for blue sky research. To weigh these things up and develop good models for a balanced programme is not the same as applying the dead hand of state central planning.

This programme cannot be devel-

oped in isolation. If the state requires education to pay for itself, particularly at tertiary level, there are important consequences.

The present cost of a science or engineering BSc course is such that: students won't risk hard subjects such as physics in case they fail; students would rather do computer science because they can earn big money quickly to pay back the huge loans they took out to pay their fees and economically disadvantaged students (which in SA more than in any other country also reflects primarily racial discrimination) cannot get access to these fields because they are too expensive and it takes too long to pay off loans. Simultaneously, the CSIR and major companies are drastically pruning their bursary schemes. Gold Fields has reportedly cut from 200 to 20.

If younger scientists and engineers, who leave research institutions

because there are no contracts, cannot get jobs in industry or at universities (which have few places), many good scientists are lost to other countries or to other disciplines or jobs.

These problems illustrate again the need to carefully analyse applications of the market. We need more physicists, chemists and engineers. Pure laissez faire policies will not provide them. Rather, this need requires careful state intervention in a programmatic way which deals with the whole range of problems, from the schools upwards.

In considering the R & D balance, we must then be clear that present policies will tend to move too much towards applied research and in-house product orientated research. Such an imbalance has potentially drastic consequences for research and for long-term socio-economic programmes.

□ Fanaroff, national secretary of Numsa, holds a doctorate in astrophysics. This is an edited excerpt from a paper delivered last week to the Science and Technology Policy Lunch Club.

**REVIEW**



# Foreign trade delegates show increased interest

179A  
SUBSTANTIAL foreign interest in being shown in this year's Southern Africa Industry & Technology Fair (SAITF) and Electrex '92 taking place at the National Exhibition Centre from tomorrow to March 13.

Organised by Systems Exhibitions, the combined SAITF and Electrex '92 have attracted a number of trade delegations from the UK, says Systems Exhibitions marketing manager Jo Melville

A number of the exhibitors are hosting overseas visitors who are experts in a wide range of fields, and will be manning stands and advising on their products

Special emphasis is being placed on application software, in an application software village, which

forms an integral part of the fair

About 15 000 purchasing decision makers are expected to visit the show.

There are several conferences, workshops and seminars running alongside Electrex '92 and SAITF '92

## Vibration

Two seminars dealing with vibration technology are running alongside Electrex '92

The first one-day seminar entitled Basic Vibration Technology takes place tomorrow and is aimed at newcomers to the field of vibration technology.

This will be followed by a two-day seminar for advanced users entitled Advanced Machine Monitoring and Vibration Analysis

310ay 9/3/92  
on March 11 and 12

Also, the South African Institute of Electrical Engineers (SAIEE) is organising a symposium entitled The Management and Auditing of Electrical Energy

Among the areas coming under the spotlight are the proposed changes to Eskom's tariff structure and principles of metering — issues of vital concern to a wide range of electricity consumers

SAIEE liaison officer Jack Yelland says the symposium will deal with a mix of electrical power and electronics engineering.

With 1992 being the 18th bi-annual exhibition, Electrex is a well established show.

Electrex '92, however, is an expansion of the tradi-

tional SAIMC (South African Institute of Measurement and Control) show and will be SA's first exhibition to group together the electrical and electronics industries

Meanwhile, the third bi-annual SAITF is poised to be the largest industrial and technological business-to-business fair in southern Africa

## Opportunity

It will provide visitors with an opportunity to see state-of-the-art products, locally manufactured products, systems, design and installation capabilities available to southern African industry

The fair embraces categories from abrasives and business travel to valves and welding.

# Universities join forces to close industry-academia gap

179A

Biday 9/3/92

THE Witwatersrand, Rand Afrikaans and Pretoria universities are to join forces at Electrex '92 to bridge the gap between academia and industry

The departments of electrical and electronic engineering at RAU and Pretoria University, and the school of mechanical engineering at Wits are sharing a stand at the show

Professor Gerhard Hancke of Pretoria University says: "There's a need for improved contact as well as joint undertakings and partnerships between the universities and industry, particularly in the field of research and development

"The universities have the facilities and the ability to assist industry in solving practical problems"

RAU's Professor Bea Lacquet says the three departments will use Electrex to show the public, business and industry the expertise, research and de-

velopment activities available at the universities.

"We would like to solicit further collaboration with business and industry in the fields of communications, coding, image processing, neural networks, fuzzy systems, power electronics, drives, pulse compression, alternative energy, power conditions, fibre-optic gyroscopes and sensors, signal processing, semi-conductor and thin-film sensors and transducers and optics and sophisticated instrumentation in a wide range of applications," she says

Professor Hancke says in addition to teaching, research is a focus of the university's business

"With 50 professors in our department — the largest of its kind in the country — industry has access to a depth of expertise few private sectors organisations could develop or sustain

"Apart from viewing ex-

amples of the types of products we have developed for customers, visitors to our stand will also be able to discuss our practical service"

Professor Lacquet says the staff in RAU's department, who all hold engineering doctorates, work in close co-operation with industry and other technical and academic institutions worldwide.

"With a high number of postgraduate students working with staff in well equipped laboratories, we have an excellent team available to deal with a wide range of technical problems," she says

The display of the Wits school of mechanical engineering will feature a robot as well as posters and photographs depicting the type of work undertaken in the school's three main divisions of mechanics, aerodynamics and industrial engineering.



Technology Fair

# Services have become a focus of attention

BID by 9/3/92

179A

A FEATURE of this year's Southern Africa Industry and Trade Fair (SAITF) is services, as opposed to products, will be the focus of attention on a number of stands.

One such exhibitor is Armatron Systems, a multi-disciplinary technical consulting and engineering enterprise which provides contract research, design, development, engineering and program management services.

Among the services offered by Armatron are design engineering, project management, product improvement, software development, maintenance and support and technical consulting.

Strategic information services are provided by Associated Information Technologies (AIT), an industrial and business-to-business research company which has positioned itself between the conventional industries of market research and management consultancy.

Information provided by AIT to its client base of some 100 companies forms

the foundation of their decision making and planning structures.

A service of a different kind is offered by Gerotek, which aims to introduce exporters, manufacturers and designers of high technology, electronic, electrical and mechanical products to EN45001 accreditation during the fair.

## Restrictions

The European Community (EC) has announced that from January 1 1993 mandatory trade restrictions will be imposed against the import of a wide range of products unless they carry the EC mark of approval, which includes the EN 45000 Series.

These are general criteria for the operation of test and calibration laboratories and are equivalent to SABS 0159.

Europe's planned EC-wide product testing and certification programme presents a range of challenges and options to SA manufacturers and exporters, who will have to become familiar with the new legal requirements in order

to determine the levels of compatibility between these requirements and their approach to certifying products for export to individual EC member countries.

SA producers may also face logistical problems trying to obtain this mark as a result of the distances involved, to say nothing of language problems and unfamiliarity with prevailing customs and excise regulations.

Gerotek's environmental test facility was recently granted EN45001 accreditation and status, empowering the local company to test products and confirm compliance with the EC's requirements and specifications.

This should help to minimise delays and foreign exchange.

Naschem's stand will include a display of its laboratory services, including its practical laboratory and environmental testing laboratories services.

Practical laboratory services cover such items as electron microscopy; particle size analysis; thermal analysis and ion chromatography.

graphy.

With laboratories becoming information intensive and the fact that environmental pressures and statutory bodies are adding to workloads, automation could be an answer, says Symmetry Software Services.

Symmetry, an independent software house specialising in computer applications in the scientific, technical and engineering fields, is exhibiting with Olivetti Information Systems to demonstrate a wide range of systems

## Needs

These are said to meet the needs of every type and size of laboratory

The range stretches from SQL\*LIMS, using any size of DEC hardware, though Symmetry's own SLIMS package written for DEC/VAX, down to pcSLIMS, which runs on a PC network.

Symmetry's areas of expertise include process control, laboratory management information systems, telemetry and expert systems.

# SA must do more with less — Godsell

USING existing human resources more effectively would help SA to multiply existing wealth four or five times, Anglo executive director (industrial relations and public affairs) Bobby Godsell said yesterday

Opening the Instructor '92 education and training exhibition at Nasrec, Johannesburg, Godsell said SA needed to do more with less, and there was potential for adding value to the labour of South Africans.

SA needed to invest in human competence and should set itself the goal of eliminating functional illiteracy and innumeracy in at least the formally employed workforce by the

119A  
THEO RAWANA

year 2000 *Blom 11/3/92*

"If literacy and numeracy training were seen as central to employment, remuneration and promotion, if it focused on industrial needs, if employers would invest now in the expectation of a medium-term return; we could do this," Godsell said

The other goal should be to ensure that every supervisor at work (irrespective of race) had received adequate supervisor training, had acquired some skills in achieving results through others "Just imagine the impact on labour productivity"

Companies also needed to take technology seriously, to plan for the constant upgrading of human skills, "just as we constantly upgrade physical technology". They should also plan for labourers to become operators, operators to become artisans, and artisans, technologists.

"These are some of the challenges facing training and development professionals. It calls them to not just do more, but rather to do better; to place less reliance on imported packages and imported gurus, to acquire good knowledge and good technique. Derived from good research and good development, here is one of the richest people laboratories in the world"



# Keys has 'modest' plans to promote technology

WHILE government is keen to promote technological development for the good of SA as a whole, the Department of Trade and Industry has a modest role to play when it comes to providing assistance.

It cannot be the arbiter of the type of developments which should take place and also develop a masterplan for technological advancement.

Speaking at the Technology Top 100 awards in Johannesburg this week, Trade and Industry Minister Derek Keys said: "In the economic sphere government has a minor role to play, and this is also true in the technology sphere."

However, the department would publish a brochure outlining three modest aims and ventures which may be helpful for the industry, and he called for feedback from the industry on these ideas.

"We already have our R40m a

Reports by  
MELANIE SERGEANT

year innovations support programme for the electronics industry. This pays 50% of the cost of developing products, and is managed by the Industrial Development Corporation and the department. In the brochure we will list some successful projects."

Keys said similar schemes could be developed for a wider range of industries, although the 50% contribution could be lowered, and other bodies such as the CSIR and Mintek could be involved in evaluations.

A second project could involve technological developments for government purchasing agencies and those of newly commercialised parastatals. Money could be made available to them to buy goods from local suppliers, thus fostering growth in the industry. "However, I'm not very keen on this idea, as market forces could go out of the window."

The third idea could involve a group of "wise men" to pick critical technologies for advancement of SA in the future. "Japan did this, and succeeded. The department could allow funds for creating such a consortium of wise men, but I have difficulty in seeing how the body would decide on one idea over another, for example."

He stressed that industry opinion would be sought to evaluate such plans, and that they could be attempted in the future.

Winners in the Engineering Week/SA Engineering Association Technology Top 100 were: CG Smith Chemicals in the chemical category; Circuit Breaker Industries in the energy category; Pilkington Shatterprufe Glass in the machinery category; Quality Electronic Developments in the electronics category; Mintek in the mining category; and the CSIR for research and development.

B/day 12/3/92

179A

# Protectionist policies 'bad for competition'

8/10/92 12/3/92  
LONG-term competitiveness cannot be ensured if countries have protectionist policies for their industries.

This is the view of Foreign Affairs Department visitor Kumar Bhattacharyya, of the Warwick Manufacturing Group in Britain. Bhattacharyya is visiting organisations ranging from the ANC to Anglo American Corporation and Eskom.

In an interview, he said Warwick was a technology transfer centre where technological development is co-ordinated with manage-

ment and integrated into the organisation of businesses.

He has advised various governments on matters of industrial policy and technology, and reckons SA should learn from countries like Britain, where deregulation and the dropping of controls and protectionism had led to success in turning around companies like the Rover Group.

"If government interferes in any way with the private sector and utilities, there is often a slowdown in efficiency, and government

in turn is held accountable," he said.

For SA to compete with newly industrialised countries like Singapore, Malaysia and Indonesia, it would need a sound technological and industrial policy free from government interference, although the private sector could get some help from government in the form of favourable taxation, or small sums of money to assist in training schemes, for example.

Looking at SA's electronics industry, which is currently having its "life sup-

port system" in the form of tariffs and duties on imported components disconnected, he said the early days of dropping protectionist policies were always traumatic, but the end results were worthwhile.

"If regulation is dropped, for example, a country becomes far more attractive for overseas investors."

Bhattacharyya said competition forces produced innovative developments, and this was the most likely way for SA to experience a renaissance and become a leader in its own right.



## Business taking technology to heart

BUSINESS is beginning to realise the most effective way of providing quality training is through the use of technology-based training systems.

While Interlearn regards technology as important, it does not regard a technology based approach as an end in itself,

says Interlearn operations director Herman Ohlhoff. "As a result, Interlearn works closely with a client to determine the relevance of technology to a specific training need," Ohlhoff says.

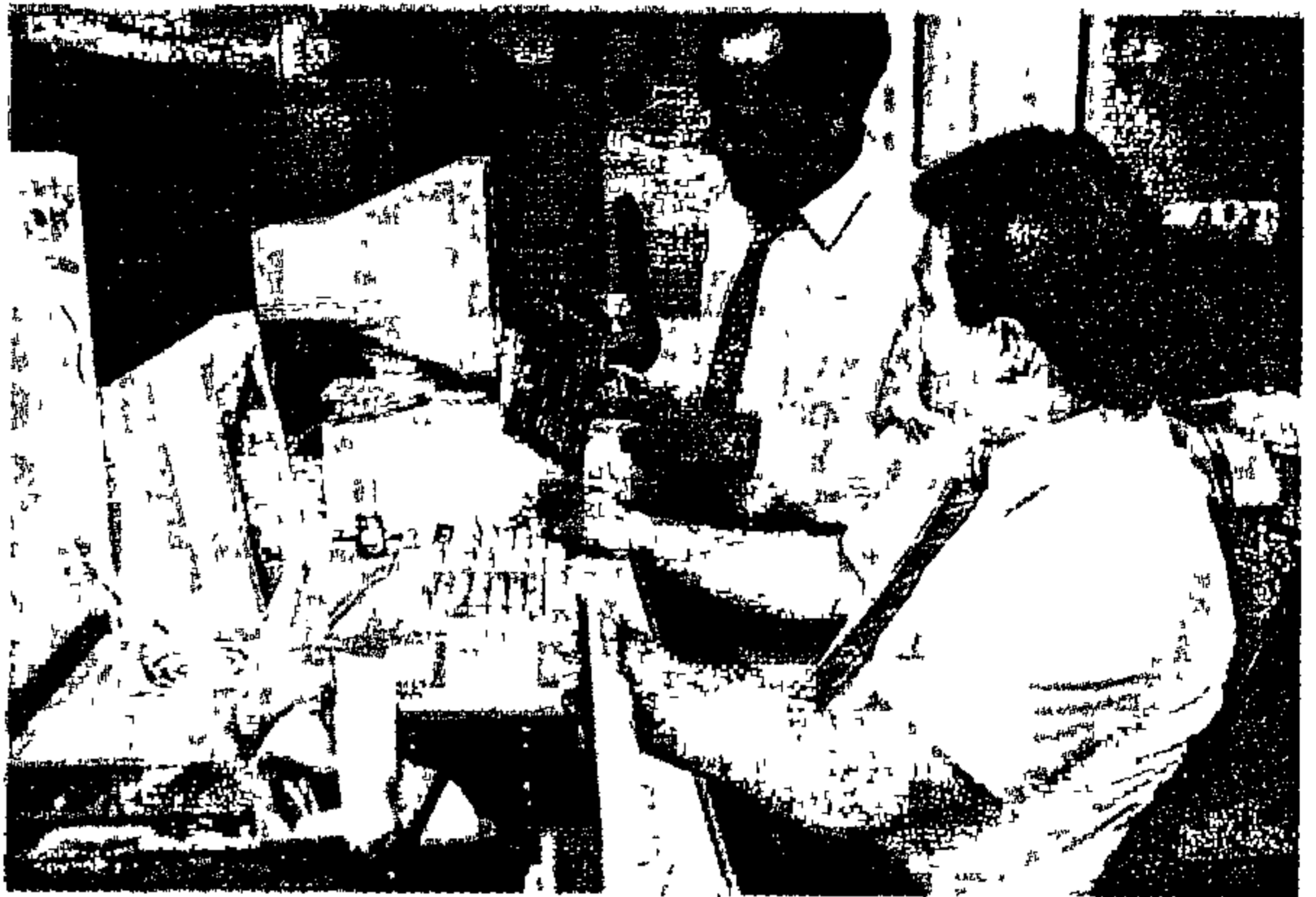
In association with a client, a knowledge base is developed which will cover the course content. Taking account of the target audience, budget, safety critical applications and the cost benefits that need to accrue, Interlearn will advise the client on the most appropriate media.

This could range from a conventional paper-based system through a training video, computer-based training with or without audio, to a full scale multimedia computer-based system incorporating video, audio and computer animated graphics — for example, Digital Video Interactive (DVI).

Having chosen the media, the instructional approach for the programme is selected. The course content will then be converted into the chosen delivery system.

# Business Day SURVEY

As the corporate sector becomes more involved in supporting education in communities in which it operates, so the technology based education and training industry looks set to become a high growth area. Interlearn works with corporate clients to set up learning centres designed to cater for their specific needs. **WILLIAM GILFILLAN reports.**



Interlearn support division personnel do maintenance and repair work on a client's installation.

## 8,5m pupils necessitate more education per rand

THERE are more than 8,5-million pupils of all races in SA today, approximately 8-500 schools, about 250 000 teachers and more than 2-million marginalised people, Interlearn non-executive director Clive Baron says.

The marginalised people are those who left the education system during the 1976 riots and other political upheavals since then. Most of them are too old to return to school and do

not have sufficient basic education skills to qualify for training.

In SA about 350 000 pupils enter the system annually. *Bipca 8/4/92*

### Compulsory

This burden will be even greater when one considers the likelihood that primary education will become compulsory, Baron says.

"We are looking at education forming very close

to 20% of the annual national budget, which is already on the high side relative to the national budgets of other countries, which average about 15%," he says.

There is marked disparity in per capita expenditure between white and other students. For whites per capita expenditure at primary school level is about R3 500 a child, rising to R4 500 a child in high school. It can be as little as

R800 per black school child in certain cases.

"Clearly parity has to be achieved and that means average per capita expenditure will average out in the region of R1 200 to R1 500 a child."

### Drop

This means with rising costs of producing education, standards will drop unless ways can be found to get more education per rand spent," he says.

Technology provides possible solutions to these problems.

"The intervention of technology at key points in the education system is not only desirable but essential," he says.

"The use of technology in education and training has been proven and, as in other

applications of technology, large productivity gains have been achieved," Baron says.

As technology can provide uniform, flexible and structured solutions in the areas of both instruction and administration, it remains a very attractive option.

Technology is becoming cheaper. A micro computer that cost R15 000 in 1986 costs R2 500 today.

The newer model works at three times the speed, implying the computing power per rand has increased by as much as 35 times.

On the other hand, the cost of labour in education is rising. By creating better teacher/technology mixes, more education per rand will be produced, Baron says.





# Corporates and communities rely on technology

B/Days 8/4/97

179A

AS THE face of education changes in SA so the corporate sector has, of necessity, become involved in supporting education in the communities in which it operates

Interlearn, a company in the Reunert group, works with corporate clients to set up learning centres designed to cater for their specific needs

Reunert considers the technology-based education and training industry to be a high growth area in the longer term

It has expanded its investment in this area forming Interlearn in February

Interlearn MD Doug Swanson says Reunert has been involved in technology based education through its subsidiary B & D education systems since 1984

## Strategic

During 1991 Reunert had the opportunity to acquire Learning Technologies and its subsidiary, SERGO

"From a strategic point of view this made sense to Reunert as there was very little, if any, overlap in product or customer base," Swanson says

The operations of the three companies have been merged to form Interlearn Solutions, a wholly owned company within the Reunert Group and therefore within the wider Barlow Rand Group.

"It is appropriate for Reunert to be involved in this business as it is the high technology arm of the Barlows Group," Swanson says.



DOUG SWANSON

The Barlows Group is also committed to ensure the availability of trainable manpower in the future

"Our aim is to provide primarily technology based solutions to the education and training market within southern Africa. This will be done either through the integration of available solutions or through the customised development of such solutions," he says

The merger of the three companies has resulted in a wide range of expertise being available to customers from a single supplier. These include software and courseware design capabilities, technological expertise, in-house research and product development capability. Clients will also benefit from the nationwide sales back-up

Interlearn's head office is located in Verwoerdburg

but also has branches in the major coastal centres and Bloemfontein

The merged company will provide education solutions in an increasing number of important areas where technology-based education will have a dramatic effect in the learning process. These areas include science, mathematics and languages

## Growing

There is a growing customer base in the electronics training field in technical training institutions at secondary and tertiary levels, as well as in the corporate sector. Equally important for the company is its growing business links with the corporate sector.

"We are working with a number of corporate clients and have jointly developed customised training packages for in-house use as well as for sale and distribution to other organisations," Swanson says

"Although we are here to maximise the bottom line, it is gratifying to know we are adding value to the country by providing effective educational systems"



## Computers play key role as teaching aid

THE computer has been employed in the field of education and training from the early '70s and with the advent of microcomputer technology, computers have become increasingly successful in this arena over the past five years.

"Computers have application in supplementing the teacher in providing instruction and they also play a central role in the administration of educational institutions. They have also been used in the field of data storage, manipulation and retrieval," Interlearn marketing and client services director Alan Witherden says.

Where computers are used, the teacher's function is changed from that of the source of learning to the facilitator of the learning process.

Blair 8/4/92 **Effective**



"Instead of the teacher putting all his energies into transmitting information, he would facilitate more effective learning by being able to give each student attention at his particular level of need," he says.

"Technology allows one to individualise to the level of each particular student on the basis that the teacher would define the content of the lesson material for each individual child.

"This enables a child to progress at his own pace according to his ability," Witherden adds.

Computers work well when used for data storage processing in school administration.

Educational administration, which is a classical data processing computer application, has benefited from the data processing capabilities of computers.

"This in turn allows the teacher to allocate more of his time to actual teaching activities."

In the computer's role in information processing, the demands of the modern world are such that the knowledge is expanding dramatically.

It is important that children have access to relevant information data bases.

High quality storage devices, such as compact disk ROMS (CD ROMS), computer networks with fibre optic links and fed from central data bases, satellite communication and other high technologies make information very accessible.

In the corporate training environment, computer technology plays a valuable role in ensuring the standardised presentation of training material.



PENTTECH has gone hi-tech

Learning to type was never like this before, say students at the Peninsula Technikon, beneficiaries of the new system

It's fun to learn to handle a computer when graphics gallop across the screen, and sound effects bleep and buzz as you tap away at the keyboard.

The excitement is due to the Australian government — which has also previously sponsored South's training initiatives.

Thanks to Canberra, 32 Amiga computers have recently been installed in Pentech's School of Art,

# Turning typing into fun-games

South 11/4 - 16/4/92

## Design and Journalism

For the school, the colour screens enhance the typing, word-processing and desk-top publishing facilities for the training of aspirant media workers.

Says senior lecturer Mr David Bleazard "There is a crying need in the communications industry for people trained in journalism skills and desktop publishing skills and we are now well-placed to fill that need."

The department now boasts state-of-the art teaching technology way ahead of other journalism schools and courses around the country.

The computers also mean that classes can be held in generating graphic computer-aided design and animated cartoon images.

Students can also use the equipment to generate titles and graphics for use in audio-visual production.

The computer studio links up with an audio and video studio, plus

control room and editing suite, which are used in teaching students broadcast journalism

Students demonstrated their interviewing abilities on screen at a function to open the facility last month

Opening the facility Australian ambassador Mr Colin McDonald, said his country's sponsorship demonstrated its belief in contributing to a representative and free press in South Africa

There are 77 students currently

registered for the Pentech journalism course, with 17 of them doing in-service training off-campus. Thirty of them have bursaries from the Australian government

South's own Vukani training programme for young journalists was originally sponsored by the Australians

● A new player on the verge of entering into hi-tech journalism training is an institute being set up at Wits University by prominent journalist Mr Allister Sparks

Backed by Canada, the institute will be linked to the prestigious international Pointer Institute.



# Technology can solve crisis

IMAGINATION and creativity is needed to solve the education crisis, says Mr Doug Swanson of Interlearn Solutions.

He says technology will overcome the enormous backlog *Swanson*

"The use of computers as education models in classrooms would improve interest," he says "This would equip pupils with the necessary skills to cope with the technological world beyond school *24/4/92*

"The teacher-pupil relationship could be enhanced "

The Interlearn Solutions was the result of a merger between Sergo Learning Technol-

*179A*  
By NORMAN JOSEPH

ogy and BD Education Systems

"Our aim is to assist in equipping South African pupils and trainees with the necessary skills required for today's challenges. We want to create an environment for quality learning "

The company offers various courses designed by leading educationists with objective input from an advisory board of academics and professionals. The courses are constantly updated to ensure relevance.



# Consumers flex muscle

**WORD** of mouth was once an unsophisticated but significant aspect of marketing and a measure of a company's good will. However, in the 1990s, the phrase had taken on a whole new meaning and marketers should contemplate it with some trepidation.

So says Tony Manning, a consultant in competitive strategy and organisational development. He told a gathering of the Executive Women's Club this week that technology had revolutionised not only industry and global information transmission, but even democracy, through media which allowed people to express their opinions.

In the process, it had revolutionised



**TONY MANNING: 'Democracy has been revolutionised.'**

Technology provides powerful new platform, says strategist

STAN 2514192

(179A)



consumerism. Customers could now take more effective action when they were victims of bad service. Once they had to rely on complaints lodged with a company official or they just expressed their dissatisfaction to friends.

Now they could phone a consumer help-line on television or radio and deliver a powerful message to the company's buying public, said Manning.

The same toll-free number system that had opened up real opportunities in direct marketing had made public debate more feasible. Manning cited SABC-TV'S Richards Bay dune-mining

debate in which polling was done through toll-free dialling.

The use of this mechanism for public debate could help end consumer apathy in South Africa and also promote greater service orientation in industry.

"Technology-driven change overtaking the globe is creating changes that are not simply cyclical, but which are permanent, structural change," said Manning.

The lesson South African marketers could learn from the situation was not to "get caught up in the day's headlines" and to avoid taking a traditional

economic view of current trends. Instead they should look at long-term, global, technology-driven implications for their industry.

Opportunities abounded, but he warned it was crucial to establish a foothold in new markets as fast as possible.

"South Africans are entering a race without training. In many cases, we are completely unfit. It's tough out there," he said.

"The world is one market for labour, information processing and for an increasing range of products and services. Trading across countries and cultures is easier than it has ever been. This is leading to a convergence of customer tastes and requirements.

"SA has only touched the tip of the iceberg in retrenchments. We can't look at recreating old jobs. We have to create new ones," Manning concluded.

# Technikon bid to boost technology

*(Times [Cape Metw] 31/5/92)*  
THE Cape Technikon is presenting a Technology Olympiad with prizes worth about R28 000, including a bursary for study at the technikon.

The aim of the Olympiad is to stimulate interest in technology among a selected group of gifted pupils.

Pupils from schools in the Western Cape are invited to participate. About 100 entries are expected.

The Olympiad is likely to be extended to the rest of the country within a year or two.

The overall winner will receive a study bursary from Eskom to the value of R12 000 for study at the Cape Technikon.

Category winners will receive a prize of R1 500 from the Foundation for Research Development, and seven runners-up a R500 prize each from Warner-Lambert and Perm.

Seven special prizes of R250 each will be donated by Langeberg and Plessey-Tellumat.

The theme of the Olympiad is Using technology to improve the living standards of developing communities, and students will present individual solutions to one of seven tasks from which they can choose.

The tasks were set by the following schools at the technikon:

- School of Civil Engineering — A technological solution to one of these problems areas: sewerage/water pollution, refuse removal/general environmental pollution, provision of housing and shelter

- School of Physical Sciences — Effective recycling of waste plastic bags

- School of Life Sciences — Apply the principles of parks and recreation management, environmental health, personal hygiene, training or job creation to raise the living standards of developing communities.

- School of Electrical Engineering — Methods to enhance savings in the use of electrical energy.

- School of Architecture and Building — The creation of defensible space in crime-ridden areas.

- School of Applied Art — Design collapsible furniture for use in the squatter community

- School of Mechanical Engineering — Design a fuel-efficient solid fuel stove.

The Cape Technikon will make the necessary expertise and facilities available to students for the design and construction of their solutions, which must comprise a written presentation and a working model/plan/poster.

The final adjudication will take place on August 8 after an oral presentation by the finalists.

Further details available on ☎ (021) 461 6220.



- C1 Well, you just can't spend all your money that way
- C Why not?
- C1 You wouldn't have any money left
- C So—
- C1 You'd starve!
- C Oh?
- C1 I know, there are other needs that we have to satisfy, besides being pretty

- C "You've told me about your family as though you were a disinterested observer, what do you feel when you are with them?"
- Another example
- C "You've several times lost the train of thought as you got around to the topic of your mother's death, I wonder if you're hesitant to show how deep it still affects you?"

# Education 'must be geared to industry'

B/day 6/5/92

Reports by LINDA ENSOR

CAPE TOWN — A closer working relationship between the private sector and education officials had to be forged to enable SA to proceed on a path of automation, Pepkor chairman Christo Wiese said at the SA Institute of Chartered Accountants conference yesterday.

He said it was necessary to create an educational infrastructure better suited to an advanced economy.

Wiese said SA would have to embark on a two-pronged strategy of automation to meet the demands of international competitiveness and job creation to deal with the unemployment crisis. Both First World and Third World strategies would be necessary to achieve sustained economic recovery

and growth.

Automation would require a restructuring and refocusing of the "hopelessly" underskilled and underproductive labour force. Education and training would have to be provided on a vast scale at institutional level and in the private sector.

Furthermore, Wiese said, there would have to be an overhaul of the education system to produce sufficient numbers of qualified staff to make greater automation possible

He said research showed SA was 40% short of engineers, engineering management, scientists, managers with a knowledge of advanced information systems and some other professionals. Of the total population about 3,2% were entrepreneurs, managers or executives; 11% were highly skilled and 38% were semi-skilled, leaving 47% who were either unskilled, engaged in the informal sector or unemployed

"We can say that 85% of our population is at best semi-skilled. The comparable figure for industrialised nations is around 60%. Clearly then, we are faced

with an imbalance in our labour force which has to be addressed and soon

"What we need is a closer relationship between the teaching institutions and the private sector to ensure that what and how people are taught will equip them to satisfy the needs of a growing economy.

"The private sector needs to take a more active role in informing the new generation of work seekers of the nature and demands of the workplace and in setting educational objectives and targets. In turn, the educational authorities need to consult more with commerce and industry in the preparation of their courses."

To address the unemployment crisis the private sector and government needed to train, employ and empower people. Wiese said the private sector, together with the Department of Manpower, had started a number of outreach programmes aimed at providing essential skills in key areas such as building, handicrafts and the establishment of community centres

He said employment targets complemented by training programmes also had to be evolved

## Illustrative Styles of Interpretation

### Interpretation Methods in the Actualizing Model

As described in this section usually come later in the relationship is well established and the counselor has goal of all interpretive actions in this section is to nation of manipulative and character styles into actives—the most functional in the hierarchy of behaviors. Discussion is based on the Actualizing Counseling and is described in Chapters 3 and 4

**Defensive Styles** As people grow they need to feel defenses threaten this feeling as people are manipulated significant others. Through these experiences they learn and to manipulate for survival. Manipulations are described by which people adapt to their environment of feeling. Figure 16 shows some manipulative patterns with eight illustrative manipulative styles

**Manipulation Analysis** Description of primary manipulation is the first step in manipulation analysis. As the client talks the therapist begins to see a pattern emerging in which the individual is utilizing one or two of the basic manipulative patterns shown in Figure 16. For example the client may continuously resort to the patterns of helplessness and stupidity or he may utilize power plays and blackmailing techniques. Once the pattern becomes clear the counselor describes to the client what seems to be his primary manipulative game or style. Manipulations are then analyzed from the standpoint of "gains" or payoffs. The active manipulations are seen to have possible covert controlling values and the passive manipulations to have possible seductive values. Gains are analyzed from a short range, as well as from a long-range viewpoint. The client is asked to state what he sees as the short-range gains received from the particular manipulation. For example, manipulations are most often used for control of others, exploiting others, avoiding situations, structuring time, and seducing others to work for one. From the long-range point of view however they can be shown to be self-defeating because they alienate

On the other side of the above argument it should be emphasized that there is a tendency on the part of many counselors to think that interpretation is simply intellectual. This is not so, because many counselors and therapists are most effective in utilizing interpretation to get emotional involvement. The following response is an example.

FM 22/5/92

MANAGEMENT

(179A)

## **Coping with change**

**When a person** cannot absorb the volume of change, culture shock sets in. Sound strategic decisions can fail if those implementing and affected by them cannot deal with the stress it causes. And in SA now, change is probably the only constant.

"People resist change, we prefer to stay in a predictable environment," says Daryl Conner, president of US-based OD Resources, a consultancy in change-management.

In the US, Conner mostly advises organisations how to deal with mergers, acquisitions, takeovers and new technology. But he also deals with changes brought about by social and political forces. So there is much potential for his services in this country, which is why he has just taken his third trip here since last August.

Resistance to change can show in low productivity, absenteeism, substance abuse and even sabotage. Conner tells how to prepare for resistance to change rather than wasting effort on grand new strategies afterwards.

His belief that South Africans are coping well with change is based, he admits, only on exposure to senior officers and a sprinkling of middle ranks

SA's business community seems to have what he calls "unconscious competence" — an intuitive sense in dealing successfully with change. The problem is, he explains, there is no guarantee that the next generation of decision-makers and implementers will be blessed with the same skills. While social leaders may "find the bridge across the many factions, is there the skills base to sustain the accord?"

Before his first visit to SA, Conner tested his system in the former Soviet Union where he had been asked to advise on the human ramifications of *perestroika*.

But, he says, in the Soviet Union, one huge, essentially economic paradigm was being changed — with social implications. In SA, "I've lost count of the number of paradigms. Every main foundation of society is being examined, if not re-ordered."

People who respond well to change have a certain resilience, a pliable strength, that can be taught, says Conner. He maintains that this strength is the enduring benefit of what he teaches. Just as training people to handle one type of corporate change develops their ability to deal with later changes in the same environment, so people are able to use these same principles to cope with family stresses — which, after all, are also organisational problems.

Conner is impressed with the "holistic picture" he has seen in SA. The business community is giving much attention to resolving social as well as business issues, he says, and the high level of uncertainty could perhaps help people in the country to realise how complex the situation is and make them aware of how much work needs to be done ■



~~Decaffeinated Other~~

	Kilogram	Free on board Rand value	Num-ber of im-ports
1988	69 544	369 225	
1989	42 109	196 819	
1990	39	8 757	
1991 Jan -Oct	55	911	4

what is the (i) identity, (ii) directorship/ membership, (iii) shareholding and (iv) address of each of these firms, (e) what products have been produced with the aid of non-repayable grant finance and (f) in respect of what date is this information furnished, (1794)

(2) whether these products are open for inspection, if not, why not, if so, what are the relevant details? (1794)

B647E

**THE MINISTER OF TRADE AND INDUSTRY**

(1) Competitiveness in international markets is based on new products and on new and adapted technology

*Coffee, roasted Decaffeinated*

	Kilogram	Free on board Rand value	Num-ber of im-ports
1988	23 502	300 307	
1989	27 206	420 455	
1990	23 376	307 066	
1991 Jan -Oct	24 612	343 483	14

Whilst governments are moving away from permanent subsidies and tariff protection towards liberalization of trade, they increasingly give support for technology development because it is start-up support that stimulates growth. Products which are being initiated, must compete on their own merits. Contrary to a policy of perpetual protection, stimulation of technology and product development is the appropriate way of encouraging industrial growth.

The Department of Trade and Industry adheres to a policy of full disclosure of information on innovation support for the electronics industry by means of the Innovation Support for Electronics (ISE) programme. Financial and other administrative information are publicized bi-annually in progress reports. Project-specific information is reflected in the reports as projects are completed, coinciding with final payment of allocated grants.

*Coffee substitutes containing coffee*

	Kilogram	Free on board Rand value	Num-ber of im-ports
1987	829	15 653	
1988	680	4 416	
1989	535	21 272	
1990	1 357	39 818	
1991 Jan -Oct	38	1 569	2

Non-repayable grants to firms

266 Mr B B GOODALL asked the Minister of Trade and Industry (1794)

(1) Whether he will furnish details on non-repayable grants given to firms in terms of the Programme of Innovation Support for Electronics administered jointly by his Department and the Industrial Development Corporation of South Africa Limited, if not, why not, if so, (a) how many firms have been given such grants, (b) what are their names, (c) how much (i) has each firm received and (ii) has been provided for this purpose in total, (d)

balance of electronic products of almost R3 billion (1794)

The ISE programme is modelled on programmes in Britain and France. Grants are not repaid in terms of the British programme, but are repayable without interest charge, if the project is successful, in the case of the French programme.

Grants such as those of the ISE programme, are the most common manner of support in countries of the Organisation of Economic Co-operation and Development—up to 50 per cent of project cost—according to its 1990 report on industrial policy. Support amounts to about 38 per cent in the case of the ISE programme, and it is taxable. Development support in the past often took the form of tax concessions, but it is considered undesirable because of intransparency. Tax concessions are "secret" in any case.

The General Agreement on Tariffs and Trade (GATT) limits support for basic research to 50 per cent, and for applied research to 25 per cent in developed countries. Support from the ISE programme is only about 20 per cent effectively.

The programme in its current form has the administrative advantage that expenditure is subject to budgetary control and is confined because it is start-up support. It is not a subsidy that will make the beneficiary dependent on support, but a stimulus for renewal and growth.

Progress of projects is inspected regularly by officials of the Industrial Development Corporation (IDC) and the Department of Trade and Industry. Projects are not finalized without inspection.

An entrepreneur develops new products to obtain a competitive advantage in the market. He therefore does not reveal his development plans. A programme aimed at stimulating development likewise cannot make public information pertaining to the development. The Department of Trade and Industry and IDC undertook

to publicize all projects which are completed or terminated (1794)

Amounts which are allocated to projects vary between approximately R30 000 and R2 million and if the grants are converted to loans, it will create a substantial administrative burden.

(a) Allocations were made to 113 projects submitted by 71 firms in the period to 31 March 1992.

(b) In the period to 31 March 1992, 23 projects have been finalized, as shown in the table below. Further names and projects will be publicized as projects are completed (or terminated) because early publication may deprive the developer of his competitive advantage.

(c) The table below shows amounts received, which are always limited to the amount originally allocated, but which may be less.

(d) The identity, directors/members, shareholding and address of each firm can be obtained from either the Registrar of Close Corporations and of Companies, or from the registered office of the company.

(e) The table below shows names of developed products. These products were exhibited at the Department of Trade and Industry on 11 to 13 May 1992. Brochures and other technical information are available from the relevant firms. Approximately 300 concerns and firms of the electronic industry were invited to the exhibition, amongst whom the press also

(f) The information is for the duration of the ISE programme, being from October 1989 to 31 March 1992. In the first 18 months only 3 projects were completed and one terminated, whilst in the following periods of 6 months each, 3 and 15 projects respectively were completed, and another one was terminated. There is thus a significant increase in projects completed, and this trend continues.

cont-4



TABLE PROJECTS FINALIZED TO 31 MARCH 1992

Firm	Project	R Total Payments	Date Approved	Date Completed
QED	Graphics Plotter	188 671	15 03 90	08 90
Cretech Stelsels	Optic Fibre Multiplexer	14 400	01 03 90	12 90
Ansys	PC based Logic Analyzer	32 400	01 03 90	02 91
Microtone	Tone Encoder/Decoder	27 250	15 03 90	05 91
Electromatic	Traffic Controller	103 966	01 03 90	07 91
Impro Technologies	Trinary Encoder IC	165 642	29 11 90	09 91
Tekpro Projects	Tagging Sensor	239 321	28 02 91	10 91
Ginnaker Electronics	Fleet Integrated Management System	230 477	29 09 90	10 91
Ginnaker Electronics	Signal Distribution System	291 960	07 11 90	10 91
Ginnaker Electronics	Automatic Antenna Tuner	184 100	28 06 90	10 91
Ginnaker Electronics	Digital Radio	535 800	28 06 90	11 91
Kavi Comm	Trunked Mobile Radio	575 303	01 08 90	11 91
O&D	Synthesised VHF Radio	217 013	23 04 91	11 91
Centralised Electronics	Fire Panels	212 847	01 08 90	11 91
Fibretek Developments	Optoscan Scanner	44 144	01 08 90	11 91
Nanoteg	Robben Data Security Card	214 400	07 11 90	12 91
Ansys Integrated Systems	Anrec Solid State Data Recorder	98 580	29 09 90	12 91
Analog Circuit Technology	Power Supply System	34 500	28 06 90	02 92
Ginnaker System Technologies	S90 Synthesizer	140 954	07 11 90	02 92
Linkdata	PAM Electronic Funds Transfer System	1 224 310	31 01 91	03 92
Fibretek Developments	Optoscan Scanner—Computer Reader Link	9 350	13 09 91	03 92
SUB-TOTAL PROJECTS SUCCESSFULLY COMPLETED		4 785 388		
Concurrent Technology <sup>a</sup>	Transputer	259 984	29 09 91	Cancelled
Procyon <sup>b</sup>	AC Modems	67 122	01 08 91	Cancelled
SUB-TOTAL CANCELLED PROJECTS		327 106		
TOTAL AMOUNT PAID		5 112 494		

Notes on cancelled projects

(199A)

(199B)

(199C)

a Cancelled due to the project being overtaken by technological developments and therefore losing its competitive advantage in the market

b Cancelled due to the loss of a key employee and the withdrawal of investment

(2) As was previously mentioned, the products were exhibited on 11 to 13 May 1992 at the Department of Trade and Industry in Pretoria, and the media were invited to visit the exhibition. Information about the products is also available from the various firms

Repayable grants to firms

267 Mr B B GOODALL asked the Minister of Trade and Industry

(1) (a) What total amount does the Government intend to provide to firms in the form of repayable grants in terms of the Programme of Innovation Support for Electronics and (b) how are the recipient firms chosen,

(2) whether the programme has a defined duration, if so, what is the duration,

(3) whether the programme is to be extended beyond the electronics industry, if so, (a) to which industries and (b) when,

(4) whether any advertisements have been placed in the media to inform the public of the existence of this programme, if not, why not, if so, to what extent?

B648E

THE MINISTER OF TRADE AND INDUSTRY

(1) (a) In the reply that follows, it is assumed that the question refers to non-repayable grants

Government voted R40 million per annum for 5 years, for innovation support for electronics

(b) The support is available to any enterprise in the private sector that proposes a meritorious project, and that

(199A)

(199B)

complies to the conditions and rules of the programme, as set out in the Guide for Applicants which is available at the Department of Trade and Industry. The rules are applicable to everyone

(2) The programme has a duration of 5 years (1989 to 1993)

(3) No decision in regard of a possible extension of the programme beyond the electronics industry has been taken

(a) Falls away  
(b) Falls away

(4) At the launch of the programme in October 1989, and since, the ISE programme has received good coverage in the media. All the technical magazines were invited to the launch of the programme

A press conference was held on 7 April 1992, to explain all the aspects of the ISE programme, and to answer questions

The media are always invited to publicize information after progress reports have been released, as was the case on 11 May 1992. It has therefore not yet been necessary to place advertisements. Should it become apparent that the industry is not aware of the programme, or if specific information is to be made known, advertisements in the media will be considered



# Affirmative action to produce black scientists

THE critical shortage of science and technology skills in SA is hampering efforts to produce technological solutions, but the CSIR has several schemes underway to help improve the situation

CSIR president Brian Clark, says the racially skewed composition of SA's scientific work force is another indication of the country's inability to create an adequate pool of high level manpower

## Creating

"We are fully committed to rapidly creating many more opportunities for all people in the exciting world of science and technology.

"We are developing a dynamic equal opportunity programme based on sound

principles of affirmative action, particularly with regard to support for students in tertiary education programmes," says Clark.

He says the blend of the CSIR's Africa expertise and the financial and technological capability of the First World constitutes a valuable mechanism for sustained black economic empowerment and development in collaboration with African countries.

This empowerment relates to five areas:

- Eliminating racial discrimination in the workplace,
- Promoting black advancement through affirmative action,
- Promoting democratisation at different levels within the organisation;

179A  
Biday 916 92  
 Improved education and training, and  
 Changes in corporate social responsibility programmes.

He says the CSIR is an equal opportunity employer, and at the beginning of 1991, it set in motion a concerted affirmative action programme

## Spearhead

The CSIR is making a determined effort to bring more black scientists into its laboratories, and has appointed former Unisa business school lecturer Silas Thlophane to spearhead this effort

At this stage, there are 350 black people in scientific posts at the CSIR, out of a scientific staff complement of 2 109.

"The rate of employing black people will be determined by our manpower needs. Right now, we are focusing on employing technicians, technologists, scientists and engineers

"A big obstacle in this drive is that black scientists are very rare in SA. There are simply not many blacks studying for science degrees at universities."

To change the situation, the CSIR is sponsoring pupils studying maths and science at high schools, to ensure a reasonable increase in entries to technikons and universities. It also offers bursaries to blacks studying for science degrees or diplomas

When employment opportunities arise, it also recruits science-qualified returning exiles

AS AFRICA's largest R & D organisation, the CSIR is well positioned to undertake and facilitate scientific and technological research, development and implementation geared to African needs.

Scientists, engineers and business people in sub-Saharan Africa could benefit from the accumulated Africa-expertise of the CSIR, and gain from their experience and needs

## Foster

The main objectives and functions of the CSIR are to undertake, foster and manage broadly based market-driven R & D, and technology transfer in support of industry, to meet the needs of community interests.

Its scope lies in its scientific and technological expertise in the fields of aeronautical systems, building, earth, marine and atmospheric science, energy, food science, forest science, information technology, materials science, microelectronics and communications, production, roads and transport, textiles, water, and advanced computing and decision support

But the CSIR's specific strength lies in what it refers to as its Africa-specific expertise. This is catering to the fact that with the

# Geared up for wider role in rest of Africa

fundamental limitations on human and financial resources SA cannot attempt to move on a broad front like developed nations do

It therefore sees its role in mounting highly focussed research programmes of specific importance to southern Africa

This allows it to participate in the global scientific and technological effort and serve as a bridge for transferring advances in relevant arenas of science and technology to the southern African marketplace in customised science and technology packages

Blending this expertise with financial and technological muscle of First World countries in collaboration with African countries could prove a valuable mechanism for sustained development.

The organisation has already made scientific and technological inputs to 14 African countries. Its contributions are mainly in three fields — infrastructure, quality of life and in-

dustry Examples of such work include.

□ A method developed so people in the Comores can make use of the abundant supply of volcanic ash for building instead of depleting coral and beach sand,

□ Various small contracts have also been undertaken in neighbouring countries such as Swaziland and Botswana, including the evaluation of locally available brick making materials;

□ In the transport arena, a contract for the rehabilitation of Malawi's national road network and planning of its transport system was undertaken. Advice was also given on the management of road construction projects in Lesotho, Swaziland and Botswana, and an inspection programme of Zambia's road network is still underway The CSIR is also active as a consultant on the development of harbours in Mozambique and Namibia, and

□ In the energy field, research is being done on smokeless fuels and smoke-

less stoves suited to densely populated under- and semi-developed areas in various parts of the continent.

This ties in with CSIR developed fluidised bed combustion technology that uses low-grade coals or even wood chips for steam and power generation

□ The CSIR supplied the technology for the replacement of diesel-driven power generating sets with 1,5 MW coal-fired steam boilers in Botswana;

## Scope

□ The CSIR will most probably become involved in the development and provision of the technology needed for the provision of low-cost electricity reticulation in under-developed rural areas of central and southern Africa.

Together with Eskom, there is scope for the CSIR's involvement in a broad project to utilise the vast hydro-electric potential of the Congo Delta,

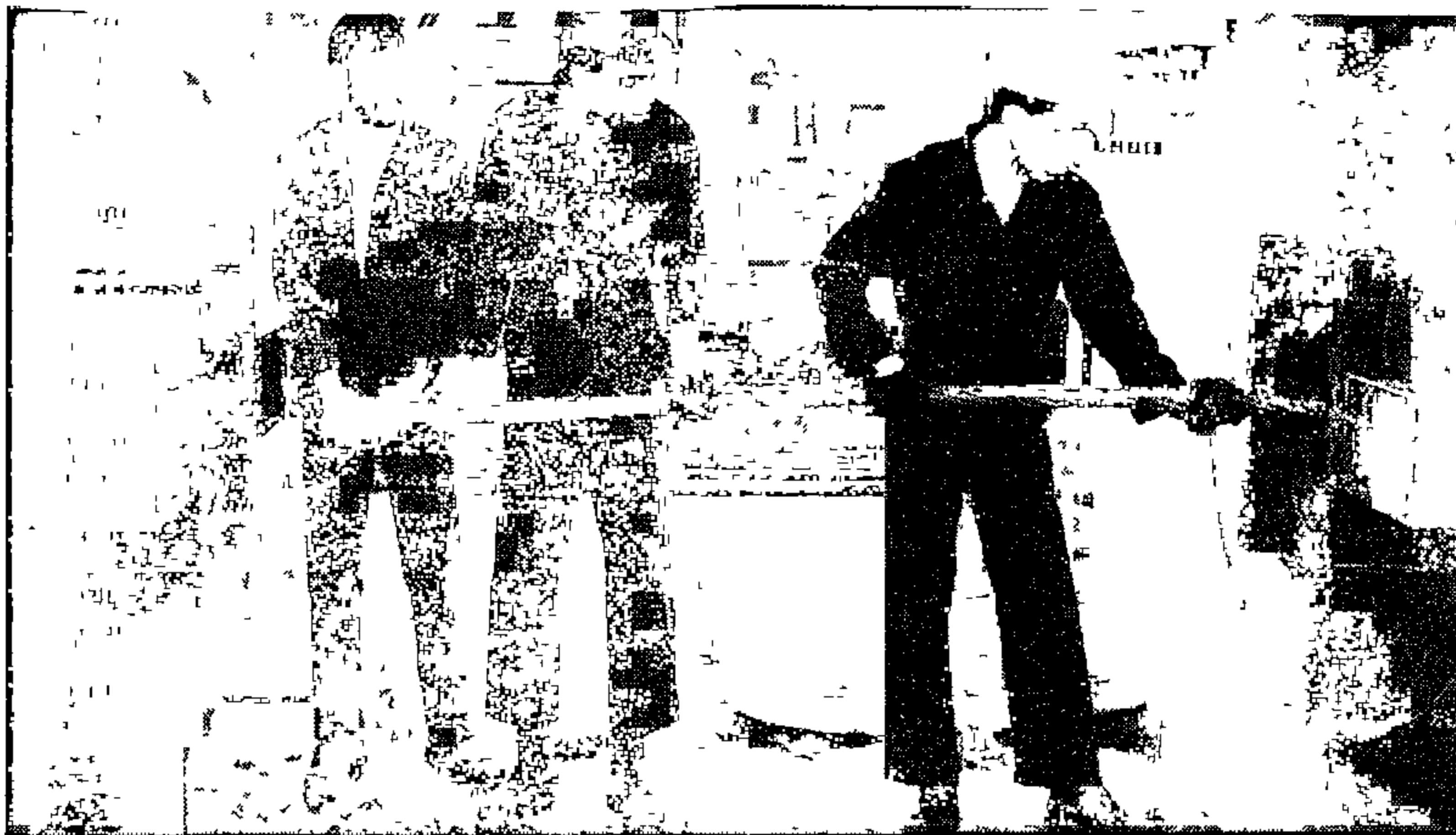
□ The CSIR was selected as the adviser to the engineering consultants for part of the Lesotho Highlands Water Project; and

□ A rapid test method for the alkali-aggregate reaction (AAR) which gives useful results within 12 days compared to the 12-month ASTM test, was developed.

Bloway 9/6/92

179A





Mine-hoisting ropes being put through the testing machine at the materials science and technology division.

## Move into more market-orientated R&D

THE CSIR was established in 1945 as a statutory national research, development and implementation (RDI) organisation, but in 1986 it initiated a process of corporate restructuring to change from a government-sponsored R & D facility into a market-orientated, autonomous corporation.

The CSIR performs about 10% of all R & D work conducted in Africa. About 55% of its R & D is funded from contract income, royalties and licensing agreements, a figure exceeded only by TNO, the Dutch national research organisation. The organisation is committed to increasing this percentage.

The balance of its income comes in the form of a Parliamentary grant.

The organisation's 1700 scientists, engineers and technologists in many parts of SA undertake broadly-based, market-driven R & D to meet the needs of the SA public and private sectors and to improve quality of life.

The CSIR's 13 divisions reflect the broad scope and depth of R & D activities.

In SA's rapidly changing society, the biggest challenge facing the CSIR is to strike a balance between leading edge technological R & D, and addressing the

needs of rural and urban developing communities.

The CSIR operates in three major areas. It uses science and technology to enhance the international competitiveness of the private sector; it provides decision support to the public sector, and it uses science and technology to improve the quality of life in developing urban and rural communities. *Blacy 9/6/92*

### Extend

The CSIR has invested heavily in people and materials in order to extend its capabilities in leading-edge technologies, including microelectronics, genetic engineering and biotechnology. These are interdisciplinary technologies which have become the driving force behind technological advances in the industrialised nations.

Already it has gained important benefits from such hi-tech research, for example, the genetic engineering of plants and micro-organisms for improved food production and animal feed production.

It is investigating low-cost electricity reticulation in rural areas in central and southern Africa, it has developed a self-contained mobile dental unit with po-

tential applications in many parts of Africa, and it is investigating the introduction into several countries of protein, vitamin and mineral-enriched foods and soya-based foods.

The organisation has been part of Africa for over 45 years. Not surprisingly its specific strength is what it often refers to as its Africa-specific expertise, and which it is currently applying to projects in about 14 African countries.

Projects range from a World Bank-sponsored contract for the rehabilitation of Malawi's road network, to research into smokeless fuels and stoves.

Low-cost housing and a portable water purification unit are two other examples of its technology.

Apart from developing relevant technology itself, the CSIR is a funnel through which First World technologies are channelled into southern Africa.

The organisation also acts as a technology bridge for the transfer of scientific and technological advances to the continent.

It is not possible to put an exact figure on the CSIR's contribution to the economy. Some of its work saves lives or improves quality of life, other efforts yield a better understand-

ing of the environment and how it should be protected.

An attempt in 1985 to estimate the contribution of the CSIR to the economy showed that for an investment of R300m in completed research programmes, the benefits up to the year 2000 totalled several billion rands.

### Phenomenon

National research councils such as the CSIR are a worldwide phenomenon, in both industrialised and developing countries. They have different forms and different purposes in each country, but their usefulness as a mechanism for establishing a "critical mass" of scientists and technologists to conduct multidisciplinary, strategically directed research to achieve specific purposes has been proved many times over decades.

The CSIR recognises that it has a leadership role to play in SA through the use of science and technology.

The existing CSIR infrastructure should be seen for what it is — an enabling mechanism for the ongoing development of SA. It may not be perfect, but in the African context it is unique and a major potential force for change.

# A funnel to bring First World technology into southern Africa

SUSTAINABLE development in any country is impossible without a technological development capability indigenous to that country.

In the case of the CSIR, Africa's foremost research, development and implementation organisation, its role in supporting sustainable development is divided into.

- Decision support for policy makers,
- Technology transfer to industry, and
- Addressing developing communities' needs

CSIR president Brian Clark says "Like similar organisations worldwide, the CSIR is a 'funnel' through which foreign technology is channelled into

SA, and a 'bridge' which facilitates regional transfer of that technology to Africa as a whole.

Having realised that the post-sanctions SA is now part of the global village and cannot afford to ignore international experience, the CSIR recently undertook a study of science and technology policy in 17 countries, identifying a number of crucial success factors.

Among these was the importance of adopting a "Team SA" approach to replace the current fragmented approach to science and technology in SA.

Members of the team include government, the non-government organisations (NGOs) such as the ANC,

academic institutions, statutory councils, national research organisations, private sector companies and the public.

"Government's role is to create the macroeconomic environment in which science and technology will flourish, and to promote training and education.

"The NGOs must put science and technology on their agenda and help determine the vision and goals of national technology policy."

The role of academic institutions must be to co-ordinate visions and goals, to supply trained manpower to the economy and to help break barriers between different disciplines.

Clark says the role of

statutory councils and national research organisations is to constitute a critical mass of manpower to achieve specific goals, to perform a technology transfer function in support of industry and the community, and to act as an enabler for national development.

Private enterprise has a significant role to play, conducting R & D and producing goods to fill market needs. "It must foster manpower training through mentoring and other schemes, and increase interpenetration of science and industry by improving university-industry interaction.

"It must also enter strategic alliances with academic research groups, and technical alliances with other companies," he says.

The public's role is to help other players to re-establish a learning culture in the community, as well as an improved work ethic.

And there is no doubt that the management of science and technology within companies and research organisations must be improved.

"The crucial role of national research organisations such as the CSIR should be recognised and exploited."

Clark says these findings should be seen against the backdrop of international experience which shows the link between technology and economic growth, and

between economic growth and political stability.

"The outlook for technology in SA is good, provided we apply the lessons from international experience, and avoid the mistakes made elsewhere.

"In this regard, we should aim to set national goals to support our efforts to be a regional player, rather than a global player, in selected and recognised areas of strength.

"We will have to accept the challenges which exist if we want to transform SA into a successful, democratic country which can meet the needs of its population and can act as a bridge for technology transfer into Africa."



# Collaboration is the name of the game

*B. Wang 9/6/92*  
THE CSIR's business is to transfer technology to industry and to the community. It is not in the business of manufacturing, marketing and distributing products and services in competition with the private sector.

The markets for its research exist in the private and public sectors, and in developing communities.

## **Enhance** *179A*

In line with its core mission, science and technology are used to enhance competitiveness within the private sector, to improve the quality of public sector decision taking and to improve the quality of life in developing communities.

Activities are directed at gaining technology which is then used to meet customers' needs, or converted into products or processes for local and international markets.

Because of the specialised nature of its R & D, the CSIR seldom finds itself competing with private sector organisations.

In the areas of service, product or process development and implementation, its approach follows the logical

sequence of idea generation, preliminary studies into the market and determining the product feasibility.

This is followed by product development, prototyping and testing and, finally, industrialisation and early market entry.

Collaboration with one or more industrial partners is sought as early as possible during this process. Joint ventures are then formed for the balance of the product and market development cycle.

## **Production**

Income is then derived from commercial arrangements such as royalties, fees, dividends or commissions.

Occasionally, in order to interest a suitable partner, the CSIR has to prove a technology by doing limited production and market testing.

However, this is essential in the industrialisation phase of the product development cycle and cannot be construed as competing with the private sector.

The CSIR believes in partnership with industry, not competition with it.

# Changes needed in SA's approach to technology

SA MUST modify its traditional approach to technology to achieve economic prosperity in a changing world environment, says CSIR president Brian Clark.

"Because of the political changes that have taken place in SA, local industry is being subjected to a much more competitive environment, both locally and overseas

## Popular

"We can no longer depend on the 'strategy of hope' approach to R&D management which was popular among large companies and research bodies in the 1950s. Here, bright people and money were combined in the hope they would produce new, successful products.

"Now, we must examine the nature of the changing technological environment, and find ways to provide solutions to specific problems"

Clark says international trends reflect rapid globalisation in all spheres of activity, a trend which would not have been possible without the pervasive effect of information technology and telecommunications.

Now, competition is growing fiercer as suppliers worldwide compete in terms of quality and price

"The role of raw materials is diminishing, because technology allows more to be produced for less raw material input.

"And the labour force is undergoing significant changes, with a nation's competitiveness being de-

termined less by natural resources and more by its ability to generate and deploy new knowledge."

Worldwide trends in R&D reflect a move towards greater co-operation, between nations, and national research councils are becoming more important

"The growing importance of 'strategically directed research' and multidisciplinary efforts create a need for centres to conduct high-tech research

"And increasing market orientation and the desire for higher and quicker returns from investment in

science require that research councils take note of market trends and perform a technology transfer function in support of industry"

These trends are being felt in SA, where the need to expand regional interaction is another priority.

However, SA has a shortage of skilled manpower, hampering efforts to produce solutions to many of its problems.

## Valuable

He says that globally and in SA, national research councils are being recognised as having valuable established infrastructure

"Locally, they are sometimes seen as part of our colonial heritage, but they have a proven worth in establishing a critical mass of scientists and technologists for specific projects

"They are an enabling mechanism for technology transfer and the ongoing development of SA," he says





# First World know-how for the Third World

THE CSIR's role in SA and in Africa generally is already well known, with the organisation having conducted many projects in collaboration with other African countries

The focus of these projects has fallen on infrastructure, quality of life and industrial development, with the CSIR harnessing First World technology for many Third World applications.

When it comes to building, many low-cost building methods have been developed and applied in a number of African countries.

In the transport arena, the contract sponsored by the World Bank for rehabilitating Malawi's road

network was awarded to the CSIR, and the organisation has also acted as advisor on road construction and inspection projects in several other countries

Energy projects include research into smokeless fuels and stoves, as well as other appropriate technologies. Investigations are also underway into low-cost electricity reticulation in rural areas in central and southern Africa.

Water projects include the CSIR's role as expert adviser to engineering consultants for the Khatse Dam, part of the Lesotho Highlands water project.

In Namibia, it treated the Khan River's water and

*Bibau 976792*  
Rossing Uranium effluents, while CSIR researchers have also advised Lesotho on an aquatic weed problem and undertaken effluent and eutrophication research in Botswana, Swaziland, Zimbabwe, Nigeria and Chad.

## Investigated

The introduction of protein, vitamin and mineral enriched foods and soya-based foods developed by the CSIR is being investigated in various countries

Kenya and Zimbabwe have utilised CSIR advisors on aquaculture.

In the health arena, the CSIR developed a self-contained mobile dental unit

with potential applications in many parts of Africa.

For the mining industry, the CSIR has developed techniques for the design and management of diamond mining in hostile, in-shore coastal zones at Oranjemund, and analyses are undertaken for mining groups in Swaziland, Zimbabwe, Mozambique and Botswana

Agricultural industry can benefit from satellite imagery provided and interpreted by the CSIR. This has wide applications for both agricultural and environmental planning in countries such as Botswana, Malawi, Zaire, Zimbabwe, and Zambia.

# Industry now has an uncle in the key technology business

OVER the past three years, the CSIR has transformed itself into a market-oriented contract research organisation and a key technology partner to industry. Formed in 1945, the CSIR is now Africa's largest R & D and implementation organisation, performing about 10% of all R & D on the continent

## Royalties

The CSIR employs about 3 700 workers and boasts turnover of more than R450m. It derives about 55% of its budget from contract income, royalties and licensing agreements.

CSIR president Brian Clark says this percentage is high compared with national research organisations worldwide.

"By focusing on expanding and improving its links with industry, the CSIR has increased its contract R & D sales into the private sector by 30%-40% a year over the past three years."

He says the CSIR's business is technological R & D and ensuring its implementation in order to

Be SA industry's technology partner to promote growth in both formal and informal sectors,

Provide scientific and technological support to enhance decision-making in the public and private sectors, and

Provide technology solutions to improve quality of life in urban and rural communities

"To these ends, the CSIR also acts as a 'funnel' through which international technologies are channelled into SA, while providing a technology 'bridge' for transferring scientific and technological advances to Africa."

Being market orientated, the CSIR meets current market needs, and by using its discretionary funding, it positions itself to anticipate longer-term market demands and opportunities.

The organisation boasts a pool of highly skilled technologists, and by harnessing this "corporate muscle", CSIR clients can obtain significant competitive advantage. Because it is not a manu-

facturer, the CSIR transfers technology to industrial partners through contracts, joint ventures, royalties, and/or licensing agreements.

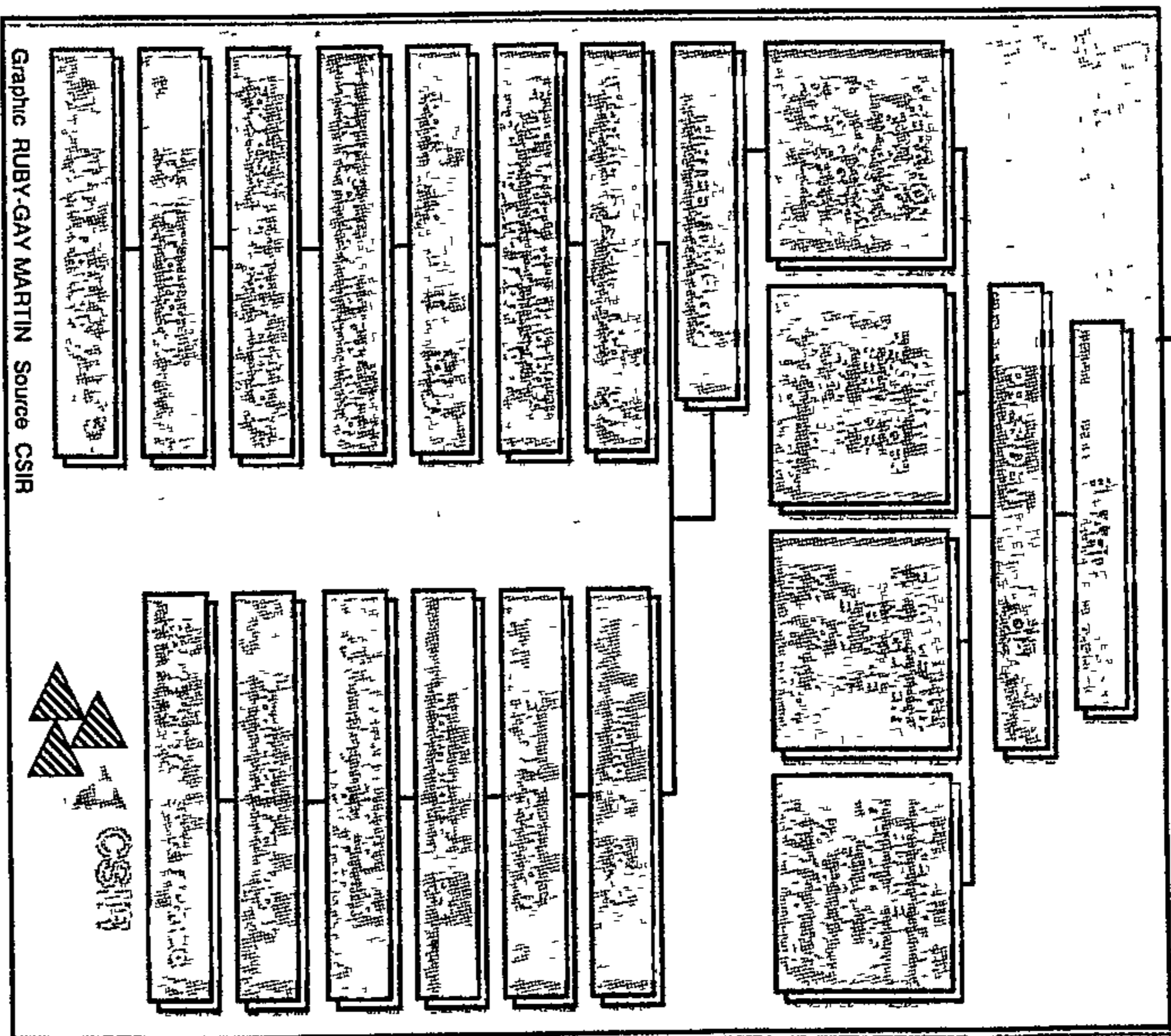
## Developed

Products and technologies recently developed by the CSIR and commercialised include the Tubocam

pipe inspection camera, a purge compound for the plastics industry, an automotive flasher unit, soya products using tofu as a basic ingredient, a flight inspection system, and a heavy vehicle simulator.

Clark says new product developments will focus on revitalising SA's manufacturing industry and improving its exports.

"Many of the CSIR's products have been commercialised by overseas or local technology partners for export or sale overseas, including a rechargeable lithium battery, a real-time magnetic disturbance alert system, axle weighing equipment, and water recirculation and wastewater treatment systems."





# Experience enhances working in Africa

Bidany 9/6/92

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MORE than 40 years of dealing with technology-related problems in Africa have given the CSIR a special understanding of the needs of the various components — First and Third World, urban and rural — of southern African communities

## Support

The organisation's Africa Strategy, which forms part of its International Strategy, seeks to harness the full scope of this Africa-specific expertise

A network of representatives in about 14 African countries has been established to assist its "into Africa drive". A number of projects are currently being pursued, some in collaboration with industrial partners, in response to specific requests by African governments

Its participation in the Lesotho Highlands Water Project is a good example of the CSIR's role as a technology partner in Africa

The organisation is also expanding its interaction with development agencies and is now registered as a consultant with the World Bank and the Deutsche Gesellschaft für Zusammenarbeit

In response to the rapidly changing competitive envi-

ronment, the CSIR's core mission statement has been amended to emphasise the importance of the organisation attaches to providing technology through the implementation of R & D.

The revised mission statement says: "The CSIR's business is to perform research and development to gain technology and thereafter to ensure its implementation in order to

- Be the technology partner of industry in the formal and informal sectors to promote economic growth,
- Provide scientific and technological support to enhance decision-making in the public and private sectors, and
- Provide technology solutions that improve the quality of life in urban and rural developing communities"

Achieving the goals means the CSIR must advance aggressively its role as the technology partner of SA industry and the informal sector, to enable them to compete profitably in global markets.

The CSIR's corporate strategy emphasises the

need to continue the process of organisational development within the framework of strategic units in selected market areas, the need to identify and strengthen the organisation's core competencies and products, and the need to standardise approaches to strategic analysis, planning and control throughout the organisation

In order to streamline organisational activities in information technology, the Board approved the restructuring of the Centre for Advanced Computing and Decision Support (Datatek), the Division of Information Services (Infotek), and the Management Information Systems Programme (MIS) into one strategic unit under the aegis of the Division of Information Services

The second thrust area defined by the core mission expresses the commitment of the CSIR to enhancing the quality of decision-making by supplying policy makers in the public and private sectors with information from R & D

One component in pursuit of this aim is a Policy Studies Unit headed by Gordon de Wet.

Its first report reviewed the role of science and technology policies in economic development in 17 countries. The report was widely disseminated and well received

More recently, a report entitled An Audit on the Science Policy and System of the RSA was submitted to the Department of National Education. The Policy Studies Unit will continue to play a major role in the CSIR's corporate technology management initiatives

## Provision

A second component relates to the provision of knowledge-based or Geographic Information Systems-based decision support systems

These systems are usually developed under contract to specific clients or partners

The importance of support for developing communities, led to the creation of a third programme, the Corporate Programme for Developing Communities, which was added to the two existing functions, Mining and Environmental Ser-

ices, which were designed to integrate the CSIR's source base

The Environmental Services Programme was asked to carry out the second and third phases of the most extensive environmental impact assessment ever undertaken in SA — to assess the impact of two options at Eastern Shores, St Lucia

A national report to the UN Conference on Environment and Development was done for the Department of Environmental Affairs. A number of environmental audits and impact assessments have also been done for clients in the public sector and in the mining and paper and pulp industries

The Mining Programme continues to strengthen its ties with the industry.

A development which benefits SA's manufacturers — specifically with the lifting of customs barriers in a unified Europe — is that the application for formal recognition by the Western European Calibration Co-operation has been accepted for SA's National Calibration Service (NCS), which is administered by the CSIR.

# This is best way, says Viljoen

THE scientific method is the best way to answer the challenges facing the new South Africa, says Dr Gerrit Viljoen, Minister of State Affairs

Speaking at the Science and Technology Policy Lunch Club — the third to be held by the Foundation for Research Development — at the CSIR in Pretoria yesterday, Dr Viljoen highlighted the opportunities facing science and the conditions that would have to exist for the scientific community to play its part correctly.

Science and technology, he said, were linked to improving the quality of life of all people, to solving the environmental crisis, to economic growth and to the realisation of individual freedoms. Ultimately, science offered spiritual upliftment

STAK  
13/6/92  
ANITA ALLEN  
Science Writer

(179A)

through a better understanding of man and his environment

The biggest contribution that science could make was to pass on its methods and values. This involved objectivity and the ability to view problems without ideological involvement.

By this he meant open debate where viewpoints were pitted against each other within the confines of mutually accepted rules. It involved the ability to understand implications before judging choices.

Scientists' desire to seek the truth, Dr Viljoen said, was something that should ideally be present in politicians.

The impartiality of scientific

values was invaluable in the nation building that was needed at this time, because it was independent of ethnic and cultural differences.

All South Africans were involved in a fast changing world, where values were changing as quickly. This would necessitate huge adaptations on the part of individual science could help facilitate the process only if it was respected. Dr Viljoen appealed to scientists to promote themselves and to be an example to all by their actions.

He was aware, he said, that to play its role, scientific endeavour needed proper funding. He called on the private sector to become more involved, by identifying the problems and funding research.



THE scientific method was the best way to find solutions to the many challenges that faced the new South Africa, according to Dr Gerrit Viljoen, Minister of State Affairs.

Speaking at the Science and Technology Policy Lunch Club - the third held by the Foundation for Research Development - at the CSIR in Pretoria last week, Viljoen highlighted the role and opportunities facing science and the conditions that would have to exist for the scientific community to correctly play its part.

Science and technology, he said, were inextricably linked to improving the quality of life of all people, to solving the environmental crisis, to economic growth and to the realisation of individual freedoms and aspirations. Ultimately, he said, science offered spiritual upliftment through a better understanding of man and

# Science has best solutions - Viljoen

South Africa 17/6/92

his environment

The biggest contribution that science could make was to pass on its methods and values

This involved objectivity and the ability to view problems from a distance without ideological involvement.

By this he meant open debate where viewpoints were pitted against each other within the confines of mutually accepted rules.

It involved the ability to understand the implications before judging the various choices

Without this scientific outlook there would be a lack of understanding which inevitably would

lead to politicising, as had happened in education

Scientists' desire to seek the truth, Viljoen said, was something that should ideally be present in politicians

The impartiality of scientific values was invaluable in the nation building that was needed at this time, because it was independent of ethnic and cultural differences

All South Africans were involved in a fast-changing world, where values were changing as quickly. This would necessitate huge adaptations on the part of individual citizens

Science could help facilitate the process only if it

was respected. Viljoen appealed to the scientific community to promote themselves and to be an example to all by their actions

He was aware, he said, that to play its role both nationally and internationally, scientific endeavour needed proper funding.

He called on the private sector to become more involved, by identifying the problems and funding research into solutions

"Good research would always attract good funds," he said

Science could best protect itself from being politicised by being divorced from the State

He was not in favour of a ministry of science as such. A fact of the future was that limited resources would be subjected to increasing demands.

Science had a unique role to play in this connection, because it had the ability to identify tomorrow's problems today and could help determine the priorities on which politicians should act.

Turning to education, Viljoen said a very worrying factor was the abysmal lack of understanding of science in the general community

This was aggravated by the fact that disadvantaged people tended to opt for so-

called soft subject choices, at a time where it was the "hard" subject choices, including all the areas of science, which contributed directly to economic development

All studies had shown that women were the catalysts for ensuring successful education

The most reliable correlation with academic success of a child was the level of education achieved by the mother

The idea that the total responsibility for education rested with teachers was erroneous, Viljoen said

Education was a full partnership with more than

half the responsibility on parents and pupils

To rectify the situation and to establish a proper climate for learning, education needed to be brought closer to the community.

Current thinking was agreed on one ministry of education to oversee policy, staffing, conditions of service, content of syllabus and examination standards

But in addition there should be a devolution to a regional system with space for involvement by the community in which the school functioned

Schools, he said, should be institutions which ran classes day and night, offering continuing education in subjects ranging from science to practical classes like budgeting and bookkeeping

This would not only provide upliftment for the educationally disadvantaged, but would also offer employment to teachers who had recently been retrenched

# Silicon Valley development is on the agenda

SA's very own Silicon Valley is quietly taking off in Pretoria

Negotiations on the establishment of Pretoria University's (Tukkies) Persequor Technopark only started in 1987 and already its developers are looking to the day when it will house some 6 000 people, all involved in high technology work.

Today 14 companies are based at the park, all of them housed in buildings belonging to two major property developers.

## Assured

According to technopark director Hugo Meyer, four companies are busy with plans to set up their own buildings and, despite the recession, the park's future seems assured. The park is a university-linked low density development which consists of a collection of high technology businesses and research bodies.

It is located, like similar parks elsewhere in the world, in attractive, park-like surroundings.

The park consists of 66 ha set among the koppies on the eastern side of Pretoria where the Pietersburg and Witbank highways cross.

It is surrounded by a concentration of some of the country's leading research and development bodies, including Tukkies, Unisa, the Atomic Energy Corporation, Armscor, the SA Bureau of Standards, the CSIR, and the Human Sciences Research Council.

The first phase of the technopark consists of about 30 stands over 19 ha. A luxury hotel and another 70 stands are planned for the second phase.

The primary services it will offer are high tech research, development and manufacture of prototype products, specialised consulting services and confer-

ence, training and office facilities

It is also envisaged that specialised manufacturing and various professional services will be provided, including consulting, banking and personal ones.

Pretoria's concentration of highly skilled manpower makes the city the ideal location for a technopark such as Persequor, says Meyer. As such, Pretoria is the city most likely to spearhead SA's evolving high-tech industry, while similar developments in neighbouring Verwoerdburg will boost the region's status as the high-tech centre of the country.

Its links with Tukkies give it an added, distinct advantage over other similar parks elsewhere in SA.

The park's mission is to establish a technological exchange between the academic community and industry. The university — with its 12 faculties and 14

institutes offer scientific, technical and management consultation, specialised courses, computer services, library and even sporting facilities.

He says the university is aiming at a "close, mutually beneficial relationship in which both sides will be of service to each other."

## Expert

Meyer mentions the example of one company based at Persequor which recently wanted to find out more about protecting equipment from lightning strikes. The university was able to almost immediately put them in touch with an expert in the field.

"If you were outside the technopark, or outside the city, you might not know where to find that kind of information. People at Persequor have ready access to a wide variety of valuable research and information."

Bloubaai 26/6/92

(179A)



## TECHNOLOGY

### **Technology advances to influence councils**

RAPID technological developments in the IT arena are expected to change the way city and town councils operate. (179A)

Midrand's mayor and computer committee chairman Alan Dawson says that to date, local authorities have used IT mainly to process accounts.

"Treasury can no longer be the major focus of IT; the community and its democratic representatives have a right to share in the benefits of technology," he says.

This, and other issues such as downsizing, open systems and geographical information systems and their implementation in local government, will be discussed at the IT in local government conference which runs alongside SA's first exhibition of municipal IT applications at the Sandton Holiday Inn on August 17 and 18.

# Local interest must be generated to lure foreign investment

THE year-old Electronics Industries Federation has presented an industry strategy to state bodies.

Federation spokesman and Spescom MD Tony Farrah says: "The next step is to implement the various parts of the strategy."

With federation members on board, the Industrial Development Corporation's (IDC's) standing committee on electronics has working groups looking at various aspects of the strategy

"Items include studying where the local industry has core competence, local competitiveness, and projects which can be done on an international scale.

"Specific topics such as tariffs are also being studied," says Farrah.

## Change

A major effort is being made to change investor feelings towards the sector. "Let's face it, before we can expect any foreign interest in this sector, we need our own financial institutions and investor public to take an interest."

Farrah says it is vital that investors start looking beyond existing standard investment mechanisms. "They need to start looking at 'riskier' ventures because these are the areas which will provide real growth for our economy in the future," he says.

Although the industry is going through tough times, having to adapt to major

cutbacks in government and parastatal spending, most major players are adapting well and some interesting developments are taking place.

Many local groups are moving away from their traditional markets.

Crucial areas in which the electronics sector must play a pivotal role in SA's growth lie in health care, education and communications systems — to name a few.

## Vibrant

"It's recognised that we must have a vibrant electronics sector to ensure we can develop products for these markets and once the products are available, they are often suited for export to other countries in Africa.

"Africa is often considered 'insignificant' by most of the world's major electronics groups, so the local players perceive it as a perfect market for their products.

"This extends to other developing nations around the world where specific products are required to suit specific market needs"



# 'Export or die' a fact of life in SA

Reports by  
MELANIE SERGEANT  
BIDPAY 30/7/92.

ONE of the fastest growing industries during the 80s, electronics has not escaped the global recession.

In SA, the electronics industry has had to face the challenges of political change as well as those of recession.

The growth of the country's electronics industry was driven largely by the desire for self-sufficiency born of sanctions-created anxieties.

Siemens joint MD Geoff Hainebach says: "Today, no customer — not even the state — is prepared to pay a premium for local products unless they offer added value."

## Limited

"However, for most products, competitive manufacture is not possible with a market limited to that of SA alone."

"Export or die" is more than just a slogan it has become a fact of life for this industry.

However, competing for exports, especially against the highly automated plants in Europe and North America, is very difficult.

Nevertheless, the Siemens plant at Waltloo near Pretoria has been successful. More than half its output is exported. Exports range from system-level equip-

ment to full exchanges and component level products like connector blocks and relays.

Hainebach says: "Because of budget cuts in SA, products shipped to Telkom and authorities within SA's ambit have fallen to less than one third of the peak reached during the mid-80s."

Low-density communication is being eyed by Siemens and many other large local electronics players as an area for future growth.

Grinaker Electronics MD Sybrand Grobelaar says: "The shortage of qualified manpower and SA's isolation forced the electronics industry to focus on internal markets, mostly regulated by the major users, to ensure continuity of supply."

"Now we're in the transition period with the prospects of free international trade, but only the multinationals see this change as a major benefit as they gear up to export freely to SA."

"It's an opportunity for the SA electronics industry as it can now negotiate more balanced agreements which will also open new marketing channels for SA products."

Generally, the SA industry believes it

does not have and cannot produce competitive products. "I believe we have many products which are very competitive internationally," says Grobelaar.

"However, the local industry must compete with industries from other countries where the electronics sector has been identified as a growth industry, and receives full support at all levels from respective governments."

"SA is more focused on supplying raw materials than manufactured goods, and the latter will have to take a higher profile to succeed."

## Progress

"The SA electronics industry, which now has the Electronics Industries Federation as its representative body, should now make progress towards getting a higher profile locally."

Grobelaar is convinced that opportunities exist in SA and in Africa, because these markets require different solutions from those developed for many countries abroad. "Our own innovation and engineering resources can play a significant role, and specific adaptations to existing products can create unique products for this market."



GEOFF HAINEBACH

Having historically supplied products to local and international defence markets which are now stagnant, Grinaker has identified new markets to which to apply its expertise.

"This includes expansion into mining electronics, with other developments involving a vehicle tracking system, a corona discharge detector for high voltage power installations and trunked radio systems."

He says that with parastatals such as Eskom, Telkom, Transel and SAA becoming involved in Africa, they will draw on SA expertise to assist them, and that this will benefit the local electronics sector.

## R&D should be encouraged to build export-led economy

IF SA is to have an export-led economy, it is necessary to have products developed locally in an environment where research and development (R & D) is encouraged, says Plessey-Tellumat group MD John Temple.

While systems like double tax benefits are slow and cumbersome, and the Trade and Industry Department/Industrial Development Corporation's (IDC's) inno-

*BIDAY 30/7/92*  
vation support scheme for electronics is a small effort, other options should be studied.

"It's important to build up the home market for products, and an industrial policy which provides some protection to encourage local products would definitely help," Temple says.

Plessey is spending about 11% of total turnover or 30% of its

profits on R & D. "As we increase our R & D expenditure it's possible to tackle more projects, and the success rate increases as a proportion of the total number of projects tackled." *(Signature)*

Broadcasting transmitters developed for the SABC are being exported to England, and are currently on show at a major fair in Amsterdam. "Then there's the

33Ghz Datalink, a short-haul telecommunications link covering 132 phone channels via microwave radio. About 100 of the systems have been sold in SA and a fair number in England." *(Signature)*

A product which enjoyed IDC support is a mine hoist monitor, a microwave device for positioning a mine skip. Nine SA mines have bought this product, now being marketed in Canada. *(179/1)*



# Innovation support scheme could be broadened

WHERE most other countries have developed strategies to foster development and growth in their electronic industries, SA has lagged.

Altron group executive director David Jacobson says SA should follow examples set by First World nations to develop to its full potential.

"Government's goal is to grow the economy through increasing exports, but to achieve this it must create a climate conducive to technology and other development; it must be an enabler to ensure companies, entrepreneurs and others are encouraged to produce goods for home and export markets alike."

## Restructuring

A fundamental restructuring of the economy will be needed if SA is to become a significant exporter of manufactured products.

While the Industrial Development Corporation/Trade and Industry Department innovation support scheme for electronics is relatively small, it is important, and could be broadened to include other industries, he says. Government should not be intimidated by negative publicity surrounding the scheme or attempts to force dis-

closure of beneficiaries and projects before these are ready for market.

"Government and industry must change their way of thinking in order to facilitate growth in the electronics sector."

To create a climate conducive to technology development (TD), a senior government post should be created so that co-ordination of all strategies — including grants, tax incentives, government procurement strategies and export incentives — is handled at the highest level.

It is vital that government-supported R & D organisations work with and assist industry rather than attempting to become businesses in their own right.

"One suggestion would be for the internal expenditure on TD in these laboratories to be matched by these labs contracting development work to industry so that they forge closer links with industry. This would go a long way to stem the one-way stream of funds into these organisations."

As things stand, SA industry generally spends less on TD than its counterparts abroad. One reason for this is that SA's industry is still young by comparison. "However, throughout

the world, science and technology has moved to centre stage, with more companies having realised that knowledge-based companies are the key to economic growth.

"Now innovation requires company structures that recognise the importance of TD as well as pre- and post-TD marketing. This could change the way many SA managers and executives perceive the role of science and technology development.

~~Flair~~ (179A)

"While most focus on short-term profits and compete on cost with largely undifferentiated products rather than with products of top quality and flair which could command greater profit margins, the new way of viewing TD worldwide could change this."

Some SA companies are flexible and have initiated group-wide TD programmes, but others remain trapped in conventional thinking.

"The latter is not too surprising because it really does take significant intelligence and foresight to compensate for a lack of exposure to and experience in TD," Jacobson says.

## SKILLS

# Training the key to landing a job

STAR 26/8/92.

(179) (179A)

Extra skills are vital in the tough job market. This extract is taken from the recently published book, **Rainbow**.

The predicted technological revolution of the 21st century is but a short step away; evidence of computers, robots and machines is common in the work place as well as everyday life, eliminating dull routine work but enforcing the need for properly trained people.

### **Technology**

Introducing technology into the working environment demands that young people must grasp every opportunity to study and train intensively.

Exciting career opportunities are being created daily but are directed only at people prepared to invest time and effort in their education.

School-leavers en-

tering the job market at the end of the year will not have an easy time when it comes to job hunting. There are fewer jobs to be had — and more people competing for them.

The scenario may seem gloomy, like a canvas painted grey — even desperate — but all will not be lost if you are well prepared. The job market may be difficult but it provides new challenges for the enterprising.

Young people with a good academic back-

ground, and the right training, will stand a better chance of finding work. The acquisition of extra skills is all-important. Think seriously about improving your "marketability" before rushing into the job market.

A matriculation certificate — or even a university degree — may not be enough to find the right sort of job.

When choosing a career one should take into consideration the economy, future skills shortages and the availability of jobs

South Africa needs artisans, mining and chemical engineers, engineering technicians, people with accounting skills, electrical and electronic artisans, building industry artisans, metal and engineering artisans, machine operators and foremen.

### **Willingness**

To have a good start in life the most important criteria are an education and a willingness to learn. Therefore make the best of these last few years at school by putting your shoulder to the wheel and discover that books and knowledge will enable you to do great things with your life. The responsibility lies with you.



# Study expects \$15bn foreign funds inflow

8/10/92 27/8/92  
**CHARLIE PRETZLIK**

THE SA economy could grow by between 3% and 4% a year between mid-1993 and 1996, economic consultant Thierry Apoteker concludes in a study produced for the French Bank of Southern Africa

From its current negative annual growth rate, a post apartheid economy would be boosted by at least \$15bn in foreign funding over a three-year period

Apoteker predicts a Budget deficit which would be restricted to 3% of GDP

A consumer led recovery will operate alongside an increase in exports, spurred on by the suspension of sanctions and the exploitation of SA's advantageous position for trading with Asia and Europe, Apoteker says

Although inflation would be a prominent feature on the post-apartheid economic landscape, Apoteker is confident any future government, whatever its political hue, will be forced to adopt a relatively conservative and liberal economic policy and contain public spending within limits acceptable to international funding institutions

This optimism is matched by French Chamber of Commerce

and Industries of Southern Africa (FCCISA) GM Dominique Brunin

Brunin said in an interview "We have seen French interest in SA take off this year as businesses realise the reticence of British and German companies is an opportunity not to be passed over by them"

He said since January the FCCI had recorded more than 50 businesses arriving in SA from France to investigate business potential, and added most departed either with contracts or with a commitment to return.

He explained this French optimism — at a time when other overseas businesses were "keeping their powder dry" — was borne out by the fact France was already the largest investor in sub-Saharan Africa and considered the gap left by other countries as an opportunity to move in to SA.

In recent months, contracts have been signed between French computer company Bull and Mohawk, between Alusaf and French steel giant Pechiney, and between Sun International and France's Accor hotel group.

## SA's technology 'lagging behind'

179A  
8/10/92 27/8/92  
**GERALD REILLY**

PRETORIA — The rest of the world was way ahead of SA in the technological field, even more so than was realised in the "comfortable" days of sanctions and isolation, Foundation for Research and Development Council (FRD) chairman Johan van der Walt says in the organisation's annual report published yesterday

Van der Walt said government

and the private sector would have to make a far greater investment in training scientists and technologists than it was doing at present

The report, handed to National Education Minister Piet Marias yesterday, said more than R59m was allocated to the FRD in 1991/92 for developing human resources in science and technology

## TECHNOLOGY

### Electronics for speeding up training and learning

<sup>610 AM</sup> <sup>111919 Z</sup>  
SIGNIFICANT benefits are accruing from technology-based training (TBT), and this form of training and education has a special role to play in developing human resources in SA. ~~(179A)~~ (179A)

At this week's Institute of Personnel Management/TBT special interest group conference organised by Strategic Business Services, visiting US TBT specialist Gloria Gery of Gery & Associates said computers were being used to accelerate learning and job performance. ~~(179A)~~ (179A)

Research showed that up to 75% of medium-sized and large US companies were using TBT in some way, with training on software application packages being the major use.

"Companies are seeing the time taken to learn reduced by 30% to 50%, and knowledge retention improves by about 25%," she said.

Organisations like IBM, Bell and Allstate are using interpersonal simulators comprising video cameras, microphones and computers to train staff.

"Users respond to various questions, choose answers, and do role playing which is recorded by the system so it can be analysed by the student."

Gery said an emerging trend was towards electronic performance support systems (EPSS) which integrated information from sources such as manuals or training programmes.



# Govt ready to back development work

GOVERNMENT was processing submissions from more than 50 groups and individuals on a new technology policy, a spokesman said yesterday

A discussion document released recently by the Trade and Industry Department said government support for R & D should be between R260m and R520m, if it was to be brought in line with other industrial countries. *BIDAY 14/9/92*

OECD countries gave industry R & D support worth between 0,1% and 0,2% of GDP, excluding funds for government institutions

The spokesman said the figures of R260m to R520m were indications only of the support available elsewhere "and places the extent of support in perspective" Government still had to decide whether and how to expand the innovation support for electronics (ISE) programme

However, government is known to be pleased

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PETER DELMAR

with the results achieved through the support programme in the two years it has been in place.

This programme — sometimes criticised because of its secrecy — had generated budgeted sales up to 1993 of R35m, the discussion document said Budgeted exports for 11 projects it supported were worth R11m. ISE benefits were R2,2m

"Central to economic growth, wealth creation and employment lies industrial growth, which is attainable by increasing a country's market share Increasing international competitiveness requires product innovation or product differentiation

"For this reason, the SA government is considering the granting of funds to industry to support innovation and technology development, thereby stimulating industrial growth essential for employment and social upliftment," he said

## Ignorance 'could lead to technology crisis'

CHARLIE PRETZLIK

(179A)

SA MANAGERS are technologically illiterate and they are dragging the country into a technology crisis, warns leading intellectual property lawyer Lawrence Reyburn. SA spent more than R300m on importing ideas in 1990 — up from R50m in 1975 — while the income generated by the sale of SA ideas abroad had remained at about R10m since 1975, Reserve Bank statistics show.

The figures indicate that there is a rapidly growing royalties, copyrights and patents deficit.

"We are not in the mainstream of the fast-moving high-tech world and we are falling behind in the level of our technological development," Reyburn said.

Unless SA can extricate itself from this rut it risks slipping back into third rate status without even the revenue to buy high-tech products from more advanced countries, he said.

Reyburn criticized managers for not being receptive enough to technological developments and not seeing the problems that ensued from this.

CSIR president Brian Clark said that "in technological terms we are a developing country".

SA invested only 0,6% of its GDP in research and development compared with between 2% and 3% for most developing countries, he said.

Wits lecturer Ania Grobicki pointed out, however, that on the international league table of patents SA ranked seventh, placing the country ahead of Korea, Sweden and Switzerland.

"The problem is not inventing things; it is commercialising what we have invented," she says.



# IT firms unite to woo hinterland

MELANIE SERGEANT

IN a drive to bring SA information technology (IT) prowess to the fore in the minds of potential African buyers, several of SA's top business and technology organisations have formed "The Africa Initiative".

The move is aimed at opening more doors in Africa for organisations by inviting the continent's key decision-makers to attend a major show in September next year.

The initiative will be formally launched to industry by the SA Engineering Association and Systems Exhibitions on October 8.

It has been welcomed by the Foreign Affairs and Trade and Industry departments and Safto.

Early indications from private sector companies show good support for the project.



JO MELVILLE

Altech company ISIS marketing director Sheldon Baverstock says "As a company committed to exporting expertise, products and services into Africa, senior members of the Altech Group have welcomed the initiative, and have

agreed to look at the many ways in which they could co-operate to ensure its success."

Systems Exhibitions marketing director Jo Melville says the project could be described as the first Commonwealth of Industri-

al, Technological and Business Games to be held in Africa. The products available, but for people to make direct contact with one another.

It will be staged in Johannesburg from August 30 to September 3 next year.

Melville says the underlying theme will be National Technology Week - Africa, encompassing technology and its link to economic growth.

The week's activities will include Electrex, The Africa Show, which is a general industrial and trade exhibition, and about 15 or 20 conferences and seminars addressing the theme "Appropriate Technology for Africa".

Safto's Africa Business Development Group director Paul Runge says SA has certain inherent advantages in trading with Africa.

These include proximity, the weak rand and our African identity.

One of SA's key assets is the fact that it has adapted technology for utilisation in various areas ranging from mining to rural development and telecommunications, he says.

## Tailor-made

"There are certain SA companies manufacturing products tailor-made for Africa.

"For example, bricking machines, vulcanising systems to repair caterpillar tyres, the CSIR, which is involved with adapted water technology and rural development, and Geological Survey, which is heavily involved in mining in west Africa.

"Although everyone talks about adapted technology, to put this into practice for mutual benefit, SA needs an exposé of this nature, not only for key players to see

the products available, but for people to make direct contact with one another.

Delegates are being invited from the African Development Bank, the Preferential Trade Area for eastern and southern Africa, the Southern African Development Community, the World Bank, the International Finance Corporation and various regional associations.

The international aid community has shown interest in the back-up, maintenance and management that SA companies can provide for projects.

Runge says SA companies should be gearing up to get involved in smaller projects, not only in large infrastructural development projects.

## Positive

"The concept is simple if one gets the right people and the right products together at the same place, the result has to be positive for all involved."

Foreign Affairs Department development director Z W J du Plessis has committed the full support of his department, which will co-operate and assist with travel arrangements, visas, and help with contacting people and organisations in African countries.

The move should cut down the need for individual organisations to make forays into Africa to look for new markets.

Chaired by chairman of the SA Engineering Association's Roy Marcus, the initiative will raise and supervise sponsorship funds from SA industry to bring the delegations to SA.

Marcus says it could cost about R500 000 to bring 50 top-level delegates to SA.

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# Foreign interest in space project

B10m 13/10/72

LINDA ENSOR

CAPE TOWN — Negotiations between international corporations and SA to place a satellite in low earth orbit for commercial purposes were under way, Public Enterprises Minister Dawie de Villiers said yesterday.

He was speaking on the occasion of arms manufacturer Denel's static rocket engine test of a propulsion system to deploy a satellite in space.

De Villiers said several international corporations had already indicated their "considerable interest" in forming a partnership with SA, and studies and investigations for this purpose were under way.

"Foreign partners are necessary for our space industry in view of the fact that Denel cannot proceed further with this programme on its own. The financial implications thereof make it impossible

"However, we are optimistic that international co-operation can make the project commercially viable."

"De Villiers said the space project would mean further technological research and development could occur, resulting in a spillover effect for SA industry, the retention of high technology manpower and the creation of thousands of new job opportunities.

"The commercial development of a space technology . . . holds tremendous advantages not only for Denel but also for other subcontractors."

Provided SA could find financially viable and profitable international

contracts, it could be a player in the international space field, he said.

De Villiers said the static rocket engine test was part of a series of tests to prepare SA's space technology for commercial application.

The solid-fuel rocket was built by Denel subsidiary Somchem, Sapa-Reuter reports.

Somchem divisional GM Jakob Dekker said the rocket motor had been designed to put a satellite into orbit. The motor being tested was the first stage of a two-stage rocket.

He said it had a static thrust of 50 tons and a payload capacity of about 500kg. This was the fourth static test, and the first in public.

Last October, Armscor spokesman Johan Adler was quoted as acknowledging that SA was involved in missile production.

"Due to the armaments embargo SA established the capability to develop and manufacture a wide range of missiles for its own military use. This includes ground-to-ground, ground-to-air, air-to-ground and air-to-air missiles," he was quoted as saying in a statement.

Officials said 95% of the space project was developed with SA expertise during the country's period of isolation. Asked where the other 5% came from, they said information on space research was publicly available.



**G**OVERNMENT proposals to encourage business investment in developing new products are welcome but limited, says a University of Cape Town economist.

The Department of Trade and Industry (DTI) proposals aimed at encouraging companies to spend money on developing their capacity for innovative production are "a significant step forward", says associate professor David Kaplan, in recognising the important role of government.

But, he adds, they have severe limitations. Kaplan, a director of the Industrial Strategy Project (ISP), was speaking at a seminar this week on research into developing an industrial policy to make South Africa competitive in world markets.

Launched in January, the ISP sees itself as a catalyst in bringing together business, labour and the government to assess what's happening internationally and devise an effective policy for South Africa.

Kaplan said the proposals put forward by the DTI tried to encourage firms' investment in new product development by:

- Offering government support, such as cash incentives
- The promise of government using its buying power to encourage local firms' product development.

● Government identifying and supporting key future technologies, such as bio-technology.

Kaplan said the proposals were flawed in that they were not selective, offering government support for new product development across the board.

Firms of different sizes would not respond equally to the measures, said Kaplan. Nor did they address what to do with declining industries or small, individual concerns.

The proposals were "stand-alone" measures and did not form part of a broad industrial policy. This would make them less effective: the market was so structured that some firms would benefit and others would not. What was needed was a centrally specific industrial policy, differentiated by sector, Kaplan said.

A further limitation was that the proposals focused solely on new products emerging from research and development programmes, denying the importance of the role of the entire workforce in ensuring high-quality production at source. Kaplan said it was universally accepted South

# 'Severe limitations' in new DTI proposals

W/Med 30/10 - 5/11/92

*New state proposals on developing*

*business don't go far enough, says an*

*economic strategist. BY GAYE DAVIS*

Africa needed marketing growth linked to sustained export growth. The dispute was over the mechanism to achieve this.

The World Bank view was that there should be wholesale trade liberalisation, with the same incentives offered for both domestic and foreign markets. This implied a passive government role: industrial policy would simply amount to "getting the trade regime right".

He argued for an alternative approach, hinging on selective trade and industrialisation policies. For example, certain industrial sectors protected

for too long would have to be exposed to greater competition to encourage them to spend more on developing export markets

There should be different tariffs and measures for each sector rather than the same for all. This meant government would have to play a more active role in determining industrial policy, Kaplan said.

Firms, left to face the winds of competition, would not necessarily improve their productivity. There was ample evidence that firms facing stiff competition would under-invest in innovation activities (their ability to increase their capacity to produce competitively).

"Countries succeeding in long-term growth of exports have relied heavily on selective trade and industrialisation policies," said Kaplan. David Lewis, also a director of the ISP, said a

coherent industrial policy would recognise failures in key factor and production markets, such as the manufacturing sector's "notorious incapability" of delivering in the important areas of job creation and increased exports.

Investment in infrastructure to sustain growth, create jobs and cater for developing skills and training was insufficient. Simply leaving everything to the market would not remedy these problems, he said.

South Africa's relations to the world economy and its domestic markets meant restructuring would happen "whether we want it or not". Failure to restructure would exacerbate the severe balance of payments problems which now hamstring South Africa's attempts to enter world markets.

"Our options are to leave everything to the market and see what comes out in the wash of a highly deregulated system; get into severe balance of payments problems and wait to be bailed out by the International Monetary Fund — or what we are advocating, which is a pre-emptive restructuring programme based on an industrial strategy guided by coherent policies," Lewis said.

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of trade rivals such as Israel (3%), Canada (1,4%), Australia (1,2%) and Taiwan (1,2%)

Headed by Jim Mullin, former chairman of the Organisation for Economic Co-operation & Development's committee on Science and Technology, the delegation is spending two weeks monitoring research in SA. Similar exercises have taken place elsewhere in the world but usually at the request of the local government. The visit is being funded by Canada's International Development Research Centre.

According to ANC head of research Frene Ginwala, the delegation's findings will help the organisation formulate, together with Cosatu and Sanco, a national science and technology policy. Ginwala, who is one of about half a dozen local academics working alongside the visiting scientists, says a large number of government departments, research organisations and universities have agreed to meet the delegation. Meetings were due to take place with, among others, the departments of Trade & Industry, National Education and Environmental Affairs, as well as all seven research councils.

"SA's existing science and research structures have served the interests of the minority. We need to restructure the current system so that the needs of all the people are served," says Ginwala. Early this year, the ANC commissioned several local consultants to investigate specific aspects of research in SA and these studies were forwarded to members of the delegation in advance of their visit.

Response among the local research community to the ANC's initiative and to the organisation's apparent commitment to science and technology, has been good. CSIR president Brian Clark says "I believe it's a positive development. The calibre of the visitors is high and the type of questions they are asking is extremely encouraging. He adds that the project is likely to shape the future of organisations such as the CSIR.

Head of the Centre for Evaluation & Policy at the Foundation for Research Development, Anastassios Pouris, also welcomes the ANC initiative. While vouching for the calibre of the international delegates, Pouris adds, however, that he has doubts about the quality of some of the local research that has been presented to the visitors. He says the fact that many of the local academics working with the delegation have strong ANC affiliations could affect the visitors' findings.

The delegation is due to present its findings to the ANC and associates before leaving SA at the end of the month. It is expected that the local organisations will release further information about the investigation early next year when the delegates' findings will be debated.

Though the ANC is still a long way from drawing up a science and technology policy, its recent initiatives have triggered considerable interest and, in some cases, support from SA's beleaguered research community.

## RESEARCH & DEVELOPMENT

### Breaking out

F-W 27/11/92

(179A)

The future of science and technology in SA — in particular the fate of State-owned research councils such as the CSIR, Human Sciences Research Council, SA Bureau of Standards and Foundation for Research Development — has come under the spotlight with the arrival of an international delegation of prominent scientists.

Brought to SA by the ANC, Cosatu and the SA National Civics Organisation (Sanco), the delegation is meeting senior representatives from several government departments, big business, research councils and other prominent figures in the local research community to discuss the role of science and technology in SA.

The visit comes when there is widespread concern about the future of research. State-financed research organisations are struggling to earn enough from the commercial sector to make up the funding shortfalls created by cuts in government spending. Extensive cuts in State grants to universities have jeopardised research at many science and engineering faculties and the Department of Trade & Industry (DTI) appears no closer to formulating the technology policy it began investigating nearly five years ago.

Spending on research and development has shrunk from just under 1% of GDP in 1985 to about 0,6%. This is well below levels



## ION TECHNOLOGY

SA technology 'unfocused' 179A

SA's science and technology policy is fragmented and lacking in focus, pointing to a need for reorientation and consolidation, early findings from a study show

Regional director of Canadian-based International Development Research Centre Marc van Ameringen says world experts teamed up with local fundis to investigate science and technology within government departments, research councils, universities, parastatals and private enterprise

They evaluated how it met the needs of the majority of the population and looked at opportunities for its transformation, considered important for the revitalisation of SA's economy

Their reports are expected to be ready early next year, but Van Ameringen says there is a need to "urgently address the needs of affirmative action"

"A cadre of black scientists and technologists will need to be developed. Science and technology institutions are very white"

The studies saw that efforts should be focused more on the needs of the

majority of the population. Elements of the system dealt with First World situations, but SA was not a First World country

"There must be a way to preserve what exists, but to re-orientate efforts to help all people in SA to realise the benefits of the system."

The study was not prescriptive and was aimed at encouraging debate and comment from both private and public sectors.

"The role of science and technology in economic development is a critical one, not an add-on. It is interesting to note that the democratic movement in SA sees this issue as an important one. One would normally expect it to be focused only on immediate political issues at this stage of its evolution," Van Ameringen says

A central concern is that when sanctions are dropped completely, there could be a shock in store for companies which have developed products and services in the cocoon of an isolated SA. Competition will increase and this could hurt local products, he says

The studies found that more than half of Africa's research capacity re-

sided in SA, so there was a significant pool of technology to assist in the development process in the new SA

The study was requested by the ANC, Cosatu and the SA National Civics Association to evaluate how the country's science and technology system, which had grown up in an apartheid culture, could be transformed

Experts involved included Jim Mullen from Independent Development Research Council Canada, who is also a former member of the UN advisory committee on science and technology for development, Geoffrey Oldham, former head of Sussex University's science policy research unit, and Deanna Ashley, a member of the scientific and technical advisory group to WHO special programmes of research, development and research training

Working with them were Cosatu's Alec Irwin, and Cape Town University's David Kaplan,

"Considering the study was carried out in the interests of a future government, we were impressed with the SA government's co-operation and openness," says Van Ameringen

# Integration is this decade's goal

INFORMATION Technology (IT) alone does not lead to competitive advantage. Rather, if IT is not fundamentally changing how companies run, it is not doing its job.

This is a key theme in the new Andersen Consulting book, Trends in Information Technology.

The goal of successful companies in the '90s is business integration. Strategy, people, operations and technology must work together.

The book says organisations are drowning in information, yet are thirsting for the data they really want and need. "The success stories of this decade will be written by those who learn to manage the information deluge."

It has also become vital to deliver the right information quickly, and to find faster ways to make products and serve customers. This places extra burdens on operations, and will lead to different strategies and technologies that create more flexible and responsive organisations.

With globalisation a key component in the '90s, and intensified competition, the authors say companies

will need to provide consistent levels of high-quality products and services

The book says five key technologies and methodologies will shape businesses in the '90s.

Multimedia and the human-computer interface will see more graphical user interfaces and other enhancements to make it easier for people to access the electronic world, and to use the full potential of systems. An increasing number of senses will become involved in the interface, and the methods by which users relate to systems will increase;

Co-operative processing brings a new processing environment where the main focus shifts from the mainframe to workstations. Users have more control over more information, and the systems provide flexibility so that business processes can be re-engineered;

With telecommunications and interorganisational networks, there will be more data, image and voice sent over networks, and the book advises telecommunications planners to carefully monitor rapid

developments in fibre and digital transmission techniques — as well as connectivity standards across the globe;

With about 80% of the typical organisation's IT budget allocated to maintaining existing systems, the fourth technology to watch is object-orientated systems development.

The problems of maintenance, of code re-usability and system flexibility are being addressed by this new method of systems development.

Object-orientated systems development allows the system to become a software model of the business, and the system is in this way shielded from the effects of change, and

There is computer-aided software engineering (Case) which has become an increasingly attractive method of enhancing productivity during systems development. By providing an entire development environment for building systems, Case allows systems developers to spend time on solving business problems, and less time on details of administration and co-ordination.