

A N N U A L R E P O R T

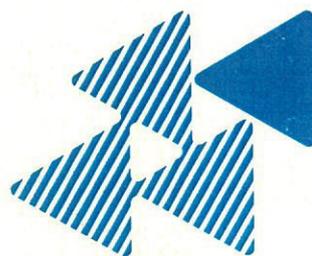


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CSIR

CSIR ANNUAL REPORT 1991

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Members of the Board



From left to right

Mr P J van Rooy

Dr W P Venter

Prof D R Woods

Mr J A Stegmann

Dr H B Dyer

Dr L Alberts – Chairman

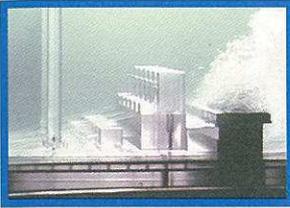
Mr R A Plumbridge

Dr J B Clark – President

Dr L B Knoll

(Mr E van As was not present when this photograph was taken.)

Highlights



HOT AIR STUDIES IN A WATER TUNNEL

A contract awarded to Aerotek to study hot air condenser plume recirculation problems in a proposed air-cooled power station using water tunnel model testing techniques, was very successfully concluded.



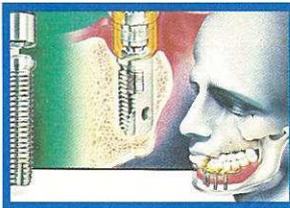
AERIAL PHOTO-INTERPRETATION COMES INTO ITS OWN

Boutek's development work in the application of aerial photo-interpretation resulted in two major contracts for accurate stratified housing counts in some 53 settlement areas in various parts of South Africa.



MALTING

Pilot-scale (60 kg) outdoor floor maltings of novel design has been commissioned by Foodtek.



BIOMEDICAL BONDING

Successful implementation of advanced surface engineering technology by Mattek promises an exciting new era for implantology in South Africa.



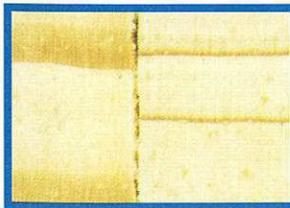
BLACK FAMILY RUNS OWN BIOGAS PLANT

In the village of Timbavati in the Eastern Transvaal the Mathabela family runs their own biogas production plant off cow dung and water to provide them with methane gas for cooking, heating and ironing.



DIGITAL TERRAIN MODELS FROM SATELLITE DATA

The CSIR receives resource data from four different satellite series. One of these is the French SPOT II satellite which also has the special feature of acquiring stereo pairs for cartographic and other applications.



A PROMISING NEW PINE SPECIES

Forestek has found *Pinus tecunumanii* to be a promising superior alternative for at least one-third of South Africa's commercially afforested area.

Chairman's Review

A VITAL LINK IN SOUTH AFRICA'S FUTURE

The future success of this country depends on several mutually interactive factors. One can picture the eventual outcome of the South African transformation as being suspended from a chain consisting of three links.

The first link represents the ultimate constitutional model that will, hopefully, lead to efficient and effective government of all South Africans. In fact, from a scientist's point of view, the right approach would be to prescribe the required performance of the government to be and then to design the constitutional model to fit the necessary functions. In management terms: first lay out the job description and then seek the most suitable candidate.

The second link in the chain represents the economic power of the new South Africa. The wide spectrum of social needs, such as education, health services, security and the individual's material welfare can be realised if the economy performs well. By now it should be recognised that the economic performance of this country must be based on a combination of its natural and technological prowess. The raw material base of our economy must be replaced to an ever greater degree by a manufacturing base, including maximum beneficiation of minerals and increased production of products and machinery.

In order to be competitive in world markets a high premium must be placed on technology backed by appropriate scientific research and development. Unquestionably the CSIR will play a major role in this

sphere. To achieve success will require sympathetic governmental decision-making, astute planning at management level, and enthusiastic participation by all the staff, sometimes to the point of measurable self-sacrifice. This organisation may regard itself with justifiable pride as a key element in the future welfare of South Africa, even more so under its new leadership.

The third link in the chain can be described by the phrase, healthy, happy interpersonal relations between all South Africans. The breakdown in communications over the last few decades – communications which, at best, were fragile because of our colonial heritage – must be rebuilt and strengthened. Spiritual values which lie at the heart of relationships have to be revived and every South African should participate in this process.

The strength of a chain is determined by its weakest link. The CSIR is determined to continue to do its utmost to enhance South Africa's economic performance and, in so doing, to contribute meaningfully to the history of this country.

LOUW ALBERTS

Chairman

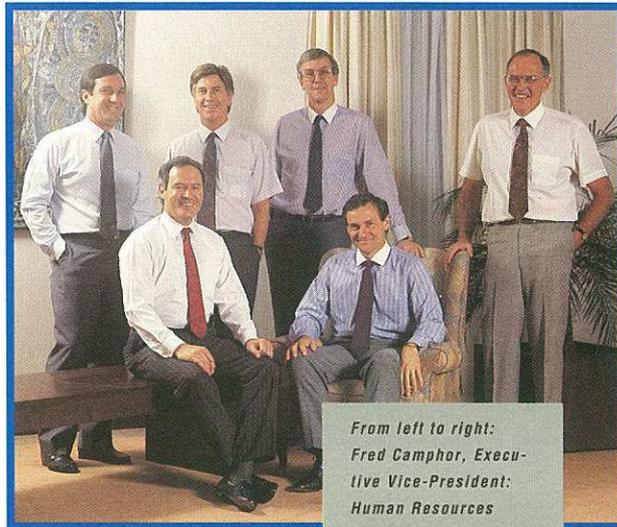
President's and Executive Management's review

PLEASING RESULTS IN TOUGH TIMES

In general, 1990 was a tough year for contract research in South Africa. In line with changing government priorities sharp cutbacks were experienced in especially the defence and energy research sectors. The downturn in the economy also put many private sector organisations under severe pressure, with resultant cutbacks in research expenditure across the board. These were especially severe in the mining sector.

In spite of tough conditions in the economy we ended the year with a total sales growth of 13.5 per cent over 1989/90 and with a surplus of R17,3 million, thereby maintaining our sound financial position under difficult circumstances. Particularly pleasing was the growth in our contract sales to the private sector.

The past year saw the launch of the CSIR's new **Division of Forest Science and Technology (Forestek)**, following the takeover of the South African Forestry Research Institute (SAFRI) from the then Department of Environment Affairs. This merger resulted in the cessation of the activities of the Division of Processing and



*From left to right:
Fred Camphor, Executive Vice-President: Human Resources Services
Albert Michau, Executive Vice-President: Finance and Management Services
Mike Groch, Executive Vice-President: Marketing and Business Development
Dr Geoff Garrett, Executive Vice-President: Operations
Dr Brian Clark, President
Dr Daan Toerien, Executive Vice-President: Operations*

Chemical Manufacturing Technology. Its timber processing research activities now form part of Forestek, while its chemical research activities were taken over by the Divisions of Materials Science and Technology (Mattek) and Water Technology (Watertek). The textile

research activities now form part of another, newly-created strategic unit, the **Division of Textile Technology (Textek)**, located in Port Elizabeth. These structural changes were carried out with limited disruption of operations.

The CSIR has been preparing for a changing South Africa in a number of ways. Our development of a scenario for technology has enabled our strategic business units to plan better for the long term. Scientific computing has entered a new era through the commissioning of two

powerful computer servers based on RISC technology. A number of significant technological breakthroughs have been achieved in areas as diverse as the demon-

President's and Executive Management's review

stration of new technologies for use in aeronautical systems and technological support for the taxi industry by the development of a Peoples' Transport 2000 Programme.

We have also invested in a co-ordinated thrust to develop and implement technologies within the arena of informal and semi-formal settlement areas. This new investment combines the skills, expertise and resources of four strategic units in order to support the provision of infrastructure within these areas. The initial focus is on basic needs using appropriate, affordable, sustainable and low maintenance technologies which can be managed by the community itself.

Our driving ambition in the CSIR is to operate as the technology partner of all our clients, customers and sponsors in the private and public sector and developing communities. We strive to maintain various international links and contacts designed to identify and transfer new scientific breakthroughs or technologies into South Africa and use our Africa-specific knowledge to benefit South Africa and the countries of Africa which seek our help.

Our "into Africa" drive has resulted in successful CSIR activities in a number of African countries, e.g. road maintenance in Malawi and Botswana; diamond exploration in Namibia, decision support for power station and tunnel design in Zimbabwe, and building failure investigations in Zambia. Our status as a newly registered consultant with the World Bank should be a further

boost for our work in African countries.

Later in this report a number of specific highlights from the line divisions' activities are discussed. These highlights provide an overview of the breadth and scope of our current operations.

The year saw a number of significant events in our history:

- The CSIR's fifth President, Dr Chris Garbers – the man at the helm during our major reorganisation – retired on 30 September 1990. He handed over an organisation well poised to make a positive contribution to the new South Africa.

- The separation of the Foundation for Research Development (FRD) from the CSIR on 1 October 1990 brought to an end 45 years of CSIR involvement in the funding of researchers in the natural and engineering sciences at universities, technikons and museums.

- In August 1990 our Chairman, Dr L Alberts, presented the first copy of a book entitled *The CSIR – the first 40 years*, by Dr D G Kingwill, to the State President, Mr F W de Klerk. The book deals with the period 1945 to 1985. It is a tribute to the foresight of legislators and also a tribute to people with exceptional enthusiasm and organisational skills, as well as to generations of dedicated and talented scientists and engineers. The book was produced by our own Scientia Printers and is a quality product of which the CSIR is justifiably proud.

■ At its meeting in October 1990 the Board approved a slightly modified Executive structure in line with the needs of the organisation following the departure of the FRD. The Board appointed the following people to serve in the functions as listed:

Mr Fred Camphor – Executive Vice-President:
Human Resources.

Dr Geoff Garrett – Executive Vice-President:
Operations.

Mr Mike Groch – Acting Executive Vice-President:
Marketing and Business Development.

Mr Albert Michau – Executive Vice-President:
Finance and Management Services.

Dr Daan Toerien – Executive Vice-President:
Operations.

CHANGING ENVIRONMENTS

Organisations worldwide are struggling to keep pace with changes in their operational environments. The ability of any organisation to learn and modify its approaches is a critical ingredient of its ability to remain competitive. Much of our organisational learning was distilled in our annual two-day review of business plans. The October 1986 Corporate Strategy foresaw an organisation flexible and open enough to have an ongoing commitment to holistic organisational learning. I am especially pleased to report that a commitment to organisational learning is now firmly

entrenched. What has been especially heartening is to see how rapidly this learning is being implemented ever more widely throughout the CSIR.

The CSIR's October 1986 Corporate Strategy fundamentally changed the nature of the organisation. The Board confirmed at its October 1990 meeting that the CSIR will continue along the course mapped out in October 1986. Some changes in emphasis were appropriate because of the dramatic changes which have taken place in the South African environment. We will still function as a market-oriented national research organisation whose priorities include research, development and the implementation of research findings. We operate via our fourteen line divisions, each focused on a priority market sector, and we will increasingly mobilise our collective resource base through mechanisms such as our corporate programmes.

Two of these corporate programmes, CSIR Environment Services and the Mining Industries Programme, have made important advances in packaging the CSIR's corporate response to specific national problems. Linked to the latter programme was a very successful exhibit at the Electra Mining Exhibition, where the CSIR won the award for the best stand, while Environment Services successfully completed a major task with the compilation of a report entitled *The Situation of Waste Management and Pollution Control in South Africa* for the Directorate: Environmental Protection of the Chief Directorate: Environmental Conservation of the Department of Environment Affairs.

President's and Executive Management's review

OTHER EVENTS OF NOTE

A commercial function was created as part of Corporate Marketing and Business Development. This will further strengthen the CSIR's ability to effectively commercialise its innovations.

In March 1990 the Division of Aeronautical Systems Technology (Aerotek) won one of five prestigious annual awards of the South African Institution of Mechanical Engineers for a cascade tunnel facility.

A new housing complex on site, called Entabeni - meaning "in the mountain" - was completed during the year and will provide visiting scientists and bursars accommodation in very pleasant surroundings.

The Division of Food Science and Technology (Foodtek) commissioned a top quality food processing pilot plant. The facilities are available to simulate a variety of unit processes.

In February the CSIR signed an agreement with ITRI in the Republic of China in which South Africa and the Republic of China mutually recognise each other's national measuring standards. This is an important element in maintaining quality standards in world trade.

Several national and international conferences were again held at the CSIR during the course of the year. In this way 24 615 delegates were brought into direct and indirect contact with the CSIR.

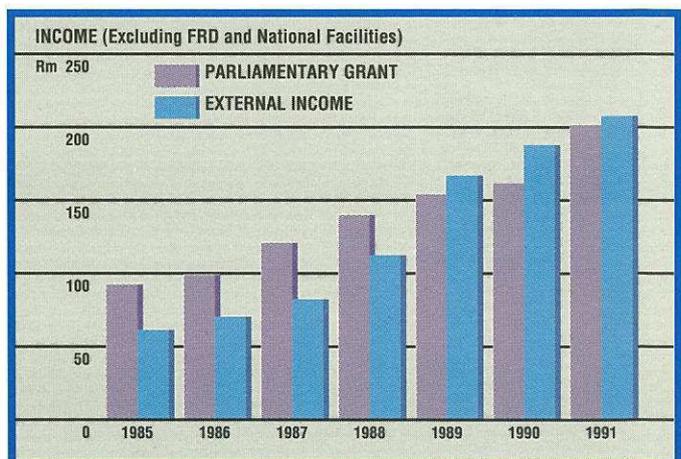
The installation of a high-speed local area network serving most of the strategic units has considerably strengthened the effectiveness of our internal communications. Management information systems under development will further promote effective decision-taking.

FINANCIAL RESULTS

The total Balance Sheet value reflects the transfer of FRD assets with its independence on 1 October 1990 amounting to R26,6 million. The National Accelerator Centre, the Radio Astronomy Observatory and the South African Astronomical Observatory were also transferred to the FRD on 1 April 1991, which will be reflected in the next annual financial statements for the year ending 31 March 1992.

For the purpose of useful comparison the figures enclosed herewith exclude the effect of the FRD and the National Facilities in prior years. Figure 1 reflects the continued swing away from Parliamentary funding while Figure 2 gives an indication of the continued improvement in turnover per employee for the CSIR. Figure 3 reflects the apportionment of the value created, highlighting the value of our employees. Figure 4 shows the growth in our private sector sales

FIG 1.



over the past number of years. (The detailed Financial Statements, with explanatory notes, are on pages 24 to 34.)

The Technology Finance Corporation (Pty) Ltd (Technifin), in which the CSIR and the Industrial Development Corporation (IDC) are equal shareholders, achieved a profit before tax and write-offs of investments of R683 000

against a budgeted loss of R1,5 million in the past financial year. After write-offs of R1,5 million a loss of R840 000 was realised. Total investments amount to R7,0 million against a budget of R12,6 million. When measured against our original projections Technifin's

cost structures are within budget, but our investment rate is slower than projected.

In November, Dr Brian Clark took over as

Chairman of Technifin for the next three years. Seven companies were formed to exploit new technology in diverse industrial areas including medical equipment, security products, electronics and computer systems. In the field of

licensing agreements there are 25 projects of which 21 originated with the CSIR. Thirteen projects have been successfully licensed internationally. Product development has been supported in 14 projects and numerous new initiatives are presently under review.

FIG. 2

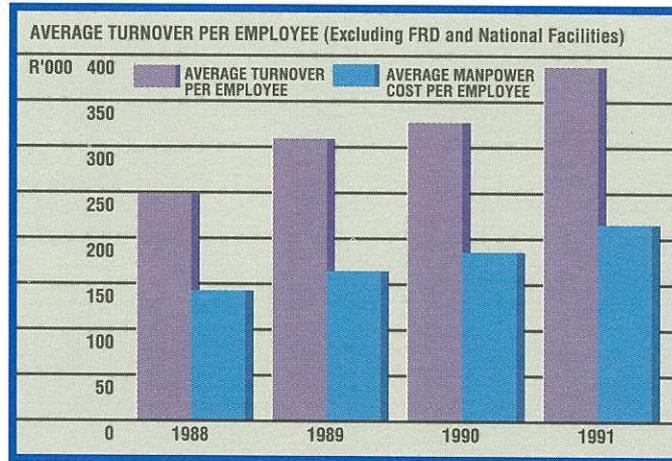


FIG. 3

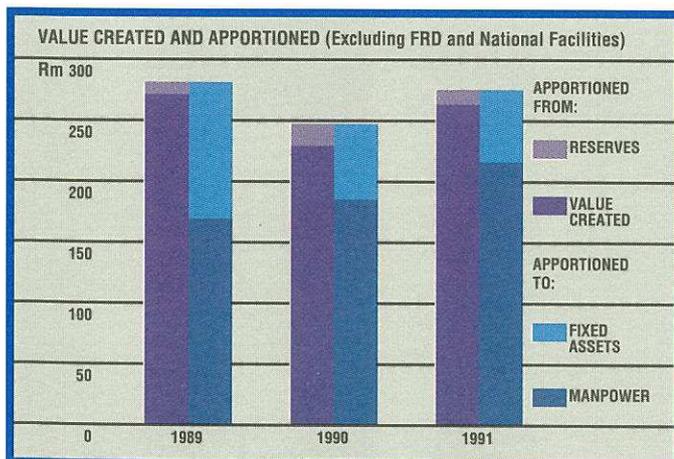
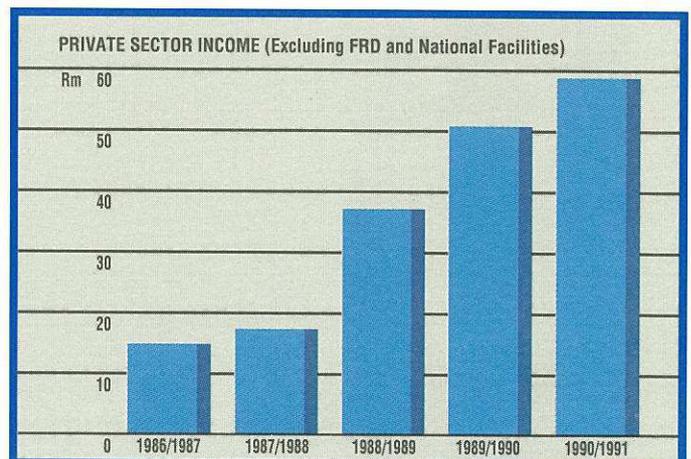


FIG. 4



President's and Executive Management's review

HUMAN RESOURCES

The total personnel complement of the CSIR declined from 4 126 in April 1990 to 3 788 in March 1991. The most important factors contributing towards this reduction were, firstly, the incorporation of the South African Forestry Research Institute (approximately 200 staff members) in September 1990, and, thereafter, the secession of the Foundation for Research Development (approximately 400 staff members) in October 1990.

The CSIR's annual personnel turnover as measured against a moving average remained relatively stable during the year at approximately 15 per cent. The number of bursars increased slightly to 224.

During the year a formal safety management system was developed for implementation in each strategic unit, and action plans were formulated for attaining the corporate aim of a Three Star NOSA grading by July 1991.

The emphasis in the provision of occupational health services within the CSIR has shifted from curative to preventative medicine. This resulted in a substantial reduction in the running costs of this service. The frequency of labour disablement injuries is already below 5 per cent on a moving average. A code of conduct for the handling of radio-active materials was also established during the year.

The recognition agreement with the National Education, Health and Allied Worker's Union (NEHAWU) was taken a step further during the year by the conclusion of the first wage negotiation with this union.

A programme for equal job opportunities was established with the appointment of Mr Silas Thlophane as Manager. This programme is aimed at the long-term provision of trained manpower for the CSIR.

The CSIR Club went from strength to strength during the year. Several events were presented in conjunction with the club at which personnel were given the opportunity to meet informally.



*Dr Brian Clark
President*



*Fred Camphor
Vice-president*



*Dr Geoff Garrett
Vice-president*



*Mike Groch
Vice-president*



*Albert Michau
Vice-president*



*Dr Daan Toerien
Vice-president*



*Johann Ahlers
Director: Mikomtek*



*Jan Becker
Director: Textek*



*Dr Ben Fouché
Director: Infotek*



*Dr Charles Freeme
Director: Transportek*



*Dr Johann Fritz
Director: Aerotek*



*Dieter Krueger
Director: Enertek*



*Dr Fred Kruger
Director: Forestek*



*Patrice Lasserre
General Manager: TSS*



Dr Duncan Martin
Head: Datatek



Dr Maurice McDowell
Director: Productiontek



Roy Page-Shipp
Director: Boutek



Dr Adi Paterson
Director: Mattek



Dr Piet Steyn
Director: Foodtek



Dr Harry Swart
Director: Ematek



Dr Ben van Vliet
Director: Watertek



Miles Griffiths
Commercialisation



Dr Dirk Grobler
Environmental Services



Johan Otto
Commercialisation



Brian Protheroe
Mining Industries Programme



Silas Thlophane
Equal Opportunities Programme

During the year more than 2 200 staff members received special training to enhance their skills and improve their performance. The increased CSIR investment in this training amounted to more than R3 million.

PERSONALIA

The CSIR's Outstanding Achiever Awards this year went to Chris Rust, Mike Thackeray, Ben van Vliet, Andries Vermeulen, Dwight Walter and Stella Wittstock. Their individual achievements have enabled us to make special progress in innovation management, battery technology, strategic management of research, aeronautics, marketing and high technology manufacturing.

In March 1991 Dr Harry Swart, Director of the Division of Earth, Marine and Atmospheric Science and Technology (Ematek), was appointed one of the eight members of the prestigious Coastal Engineering Research Council, an international policy-making body of the American Society of Civil Engineers.

Dr Charles Freeme, Director of the Division of Roads and Transport Technology (Transportek), was elected to the Executive Committee of the International Society for Asphalt Pavements early in 1990. The committee consists of ten members from different countries throughout the world.

Dr Piet Steyn, Director of the Division of Food Science and Technology (Foodtek), was elected Vice-President of two international organisations, viz the Applied Chemistry Division of the International Union of Pure and Applied Chemistry (Oxford), and the International Association of Cereal Science and Technology (Vienna).

As a part of our ongoing close relationship with South African universities, Dr Brian Clark was appointed to the Council of the University of Pretoria, and, in addition to numerous other CSIR staff who function as honorary professors, Drs Terry Watson,

President's and Executive Management's review

Johan de Beer and Ben Fouché were respectively appointed honorary professors at the University of the Witwatersrand, the Rand Afrikaans University and the University of Pretoria.

At the end of the financial year Minister K D S Durr and Deputy-Minister Dr T G Alant were assigned to new responsibilities within Government. We thank them both for their continued interest in and support of CSIR activities, and wish them well with their new duties.

During the course of the year certain Board Members' terms of office came to an end. Dr C van der Pol and Mr J A Stegmann have served as Board Members for twelve and six years respectively. Both have made major contributions to the CSIR, especially during the period of reorganisation, and we acknowledge their contributions with gratitude.

We are pleased to welcome Mr P du P Kruger of Sasol and Dr G S Sibiya as new Board Members from 28 January 1991 and 1 January 1991 respectively.

As this report was being prepared, further changes to the CSIR Board were announced. Our present Chairman, Dr L Alberts, will retire on 30 June 1991 and Prof D R Woods's term ends on 31 May 1991.

Dr Alberts was the first non-executive Chairman of the Board under the new CSIR Act. In this role he played a vital role in liaising with Government on policy matters and has provided especially valuable support to the President.

On 1 July 1991 Mr P du P Kruger becomes the second non-executive Chairman of the CSIR Board. We look forward to his contributions and believe that he brings special skills necessary for the ongoing development of the organisation.

It was also announced that Mr D L Keys, Executive Chairman of Gencor, and Mr J C Hall, Executive Director of Barlow Rand, will join the CSIR Board from 1 June 1991 and 1 July 1991 respectively. Both gentlemen are well-known business leaders in South Africa and we look forward to benefitting from their wide-ranging skills and insight.

A FUTURE BUILT ON TECHNOLOGY

The process of building a South African society founded on justice, universal franchise and non-racialism with the emergence of a new nation confronted by expanding horizons and enlarged opportunities for all, is a complex and challenging process. Public debate is presently dominated by high priority socio-political concerns, but the changes sweeping South Africa are so fundamental that no part of our society will remain untouched.

Science and technology are fields with particularly poor representation by people of colour. This is an important issue confronting our equal opportunity programmes and is affecting the CSIR's ability to change the status quo in the short term. The enhanced attractiveness of science and technology as a career option, coupled with quality tuition in Mathematics and Science in our schooling system and opportunities for tertiary education present us with the only mechanisms for changing the situation over the next decade.

The importance of investment in science and technology as a major enabler of economic growth has been documented internationally. In developing nations spending on science and technology has always been modest in comparison with developed nations. However, the newly industrialised countries of the world have shown that modest investment can be translated into success when it is well focused and designed to generate a competitive advantage in the world marketplace. These countries have all shown special abilities to piggy-back their efforts onto the spending of the developed nations.

Sustained investment by Government and the private sector in science and technology will be vital for our emerging society. This will require visionary leadership by all involved, especially during a time of heavy legitimate other demands on Government spending.

We in the CSIR believe in transferring the best international breakthroughs to South Africa. We also make sure that we have the ability to perform our own, ongoing innovation and development with special attention to implementing these initiatives in practice. All the newly industrialised countries have also shown continued growth in the amounts invested in science and technology when expressed as a percentage of gross domestic product. By contrast, much of Africa has shown declining spending levels on science and technology and poorly directed spending through inadequate policy mechanisms.

In the recent past trends have indicated declining levels of investment in science and technology. Which path will South Africa choose in future?

HIGHLIGHTS

The CSIR today uses a variety of Corporate and Strategic Unit publications to publicise the outputs of our research. In this Annual Report we will briefly describe specific highlights of the past year from our fourteen strategic units to indicate the scope of our activities.

President's and Executive Management's review

HOT AIR STUDIES IN A WATER TUNNEL

A contract, awarded to the Division of Aeronautical Systems Technology (Aerotek) by a Dutch company in January 1991 to study hot air condenser plume recirculation problems in a proposed air-cooled power station using water tunnel model testing techniques, was



successfully concluded. Further enquiries from European companies for similar investigations have been received. This international interest is the result

of the successful development of novel and very effective water tunnel testing techniques in the field of Wind Engineering. These techniques are especially concerned with the simulation of hot air plumes issuing from power stations and the accurate measurement of the extent of wind

induced recirculation of such hot air plumes, which adversely affects power station performance.

SKYFLY TARGET DRONE AIRCRAFT

The Division of Aeronautical Systems Technology (Aerotek) has recently developed Skyfly, a new target drone aircraft for the training of anti-aircraft gunnery crews. This target drone - a delta-wing, pusher-propeller design with ample space for instruments and payload - had its first successful flight on 7 March 1991.

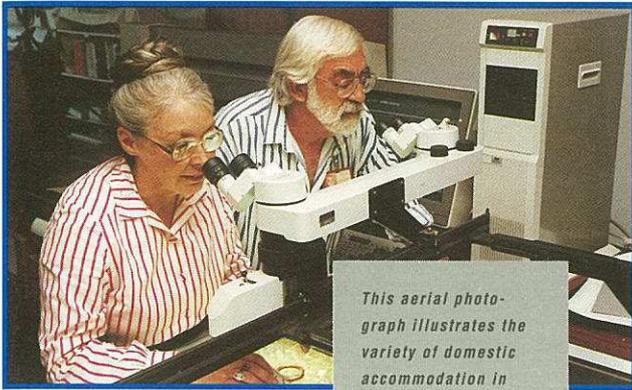
It has a wing span of 2,3 m, length of 2,2 m, fuselage

diameter of 230 mm, a payload of 25 kg and an all-up mass of 60 kg maximum. With its 16 kW engine it can

fly at speeds of up to 200 knots for longer than an hour. Skyfly has high commonality with towed high-speed targets in use by the S A Air Force and can be fitted with the Aerotek Acoustic Miss Distance indicator.



The new Skyfly target drone.



This aerial photograph illustrates the variety of domestic accommodation in part of a township. At top left, in the bend in the street, two distinct types of formal housing occur: one having backyard shacks (extreme left and top left) and the other situated on larger erven with no backyard shacks (middle left and top centre). On the right, between the road and the railway line, are shacks, seen on the far left, below the road. At centre, below the road, hutments and barracks can be seen, and hostels at the very bottom.

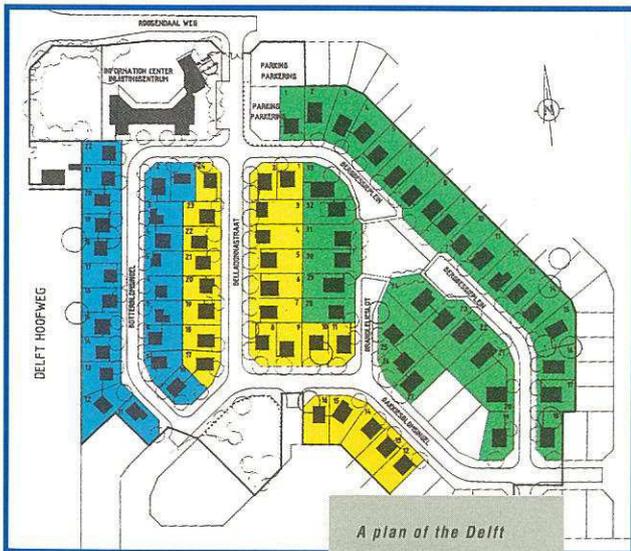


AERIAL PHOTO-INTERPRETATION COMES INTO ITS OWN

The Division of Building Technology's (Boutek) development work in the application of aerial photo-interpretation resulted in two major contracts for accurate stratified housing counts in some 53 settlement areas in various parts of South Africa. Houses range from shacks in squatter areas for which no maps exist, to conventional houses in formally laid out townships. These counts were used for accurate population estimates in respect of certain inaccessible areas for the 1991 Census, and tight time constraints applied.

THE DELFT PROJECT

The unique Delft project near Cape Town, commissioned by the House of Representatives, is one of the most successful housing projects in the country to date. The project was planned on a community basis from the beginning and will eventually comprise 15 000 houses. The Division of Building Technology's investigation has looked at the project through the "eyes" of the different groups involved. Many unusual features have been incorporated, in particular the wide choice given to owners (in the range of R12 500 to R17 000, excluding land), the show village principle, competition between the developers, an on-site information centre and the use of pre-paid electricity meters.



A plan of the Delft show village.

President's and Executive Management's review

FORECASTING POTENTIAL SALES

One of the Centre for Advanced Computing and Decision Support's (Datatek) recent projects involved developing a model to help clients predict their potential sales at each of several different outlets. The model is encapsulated in a user-friendly computer package that greatly enhances its usefulness and accessibility. This decision support tool helps managers determine

whether outlets are currently functioning above or below their inherent potential, and what the sales potential at new locations might be. The management information enables the owner to make more cost-effective decisions about where to locate new outlets, and which existing outlets warrant revamping.

LOCALLY DEVELOPED AUTOMOTIVE FLASHER UNIT

In terms of a joint venture National Lamps, the well-known automotive lighting supplier, has started production of a new automotive flasher unit which was developed by the Division of Production Technology (Productiontek). The flasher unit boasts a rugged design, high local content, and heavy duty current handling capabilities. It is suitable for use in many cars and trucks and two versions are available - for 12 V and 24 V. Productiontek not only assisted National Lamps to diversify into a new business area, but was also responsible for getting the production line

going at the factory which is producing the unit.

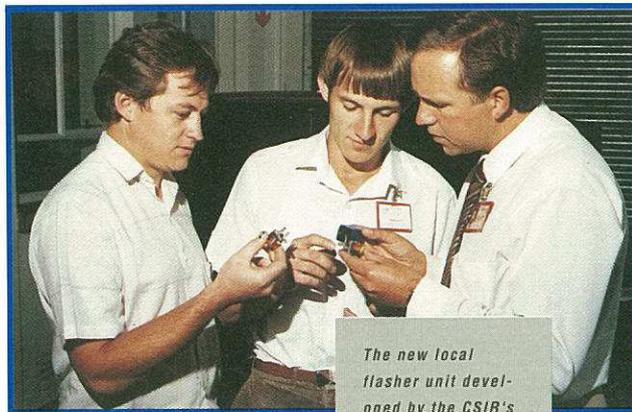
Besides training personnel who produce and test the

flasher unit, Productiontek staff selected the production line equipment and did the layout of the production area.

In the past, all flasher units had to be imported into the country.

This locally developed

unit will help save foreign exchange and provide a further boost to the local content programme for the automotive industry.



The new local flasher unit developed by the CSIR's Division of Production Technology. It features a rugged design, is capable of handling heavy duty current and has a high local content

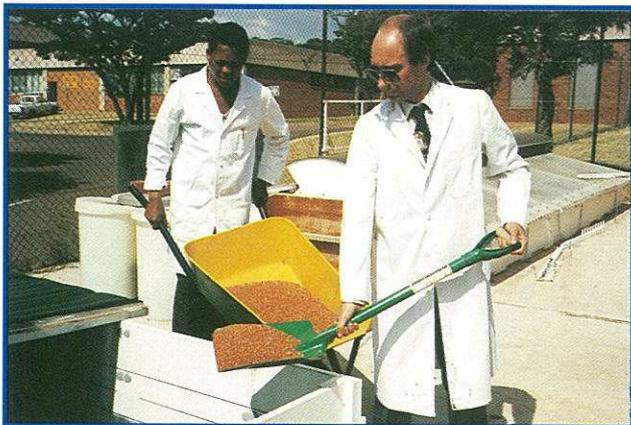


Mr David Kirkman, Managing Director of ICAL, and Mr Dieter Krueger, Director of the Division of Energy Technology, signing the technology licensing agreement for FBC units.

FBC LICENSING AGREEMENTS

The Division of Energy Technology (Enertek) has recently signed two technology licensing agreements with industrial partners for the construction of fluidised bed combustion (FBC) units. These joint ventures with International Combustion Africa Limited (ICAL) and Energy Engineering (Pty) Ltd represent a major step towards implementing CSIR developments in South Africa.

The CSIR brings into these agreements extensive FBC expertise which is well-matched to the manufacturing and project management skills of its two partners. This combination is set to become a major force in the provision of industrial combustion systems.



MALTING

Pilot-scale (60 kg) outdoor floor maltings of novel design has been commissioned by the Division of Food Science and Technology (Foodtek). Some 100 000 tons of sorghum grain are malted in floor maltings in South Africa annually. Malting is an ideal technology for the small entrepreneur whereby grain is converted into a value-added, shelf-stable saleable product. The new design addresses two major problems with current outdoor floor malting technology, namely poor control of environmental conditions and spoilage by vermin. The pilot plant investigates optimum germination conditions for different cereals and legumes, studies prevention of microbial attack, and serves as a demonstration model.

President's and Executive Management's review

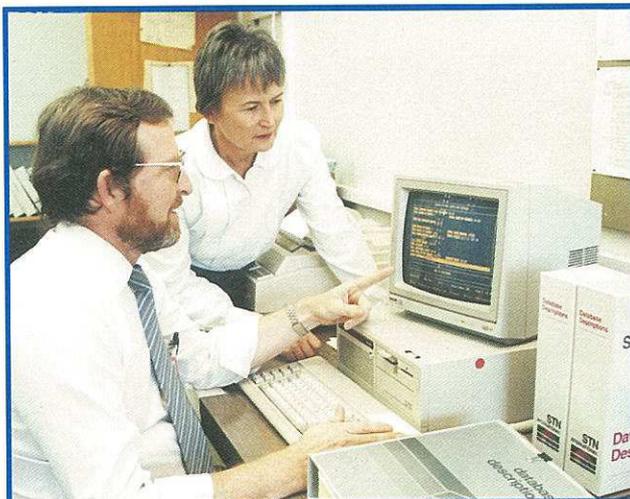
SOYA

Due to animal protein shortages, the use of soya is increasing world-wide. The Food Processing team at the Division of Food Science and Technology (Foodtek) has developed novel soya products using Tofu as the basic ingredient. The newly-developed products include Tofu stew, Tofu patties, marinated Tofu and Okara bis-

cuits. Okara is a high-fibre by-product of the Tofu manufacturing process. None of these products have any undesirable "beany flavours", and some have great potential for the frozen prepared meals market. Cold desserts from soya milk were also developed.

MATERIALS INFORMATION CENTRE

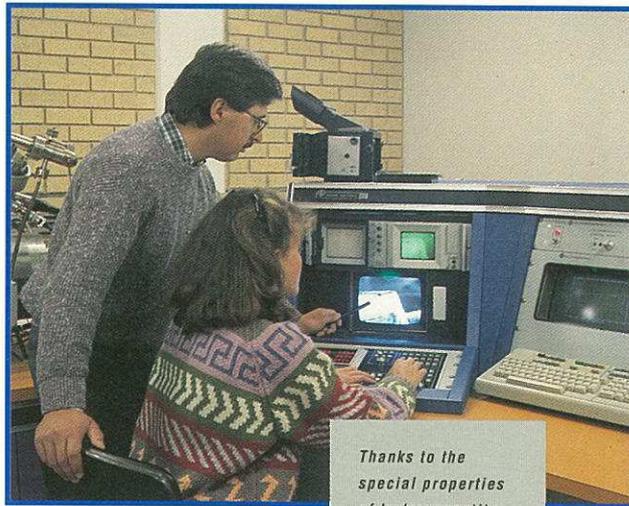
A new Materials Information Centre has been established within the Division of Information Services (Infotek), specifically to offer specialised information and library services to the South African materials community. The Centre will be used as a base to offer value-added information products to industry. It can provide on-line international



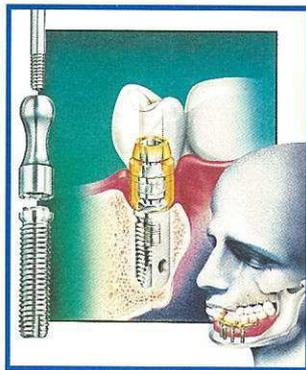
data base searching and international CD-ROM data bases from the decentralised location. The venture is underpinned by the vast information resources available at the CSIR, as well as the organisation's scientific expertise in the field of materials science and engineering.

BIOMEDICAL BONDING

In both the medical and dental professions there is a need for metallic or ceramic implants that can bond directly with bone, a phenomenon called osseointegration. Important applications of this technology include restorative dentistry, which can allow a patient to be fitted with permanent replacement teeth. The latest and most promising method of achieving osseointegration is to



Thanks to the special properties of hydroxyapatite implants such as this orthodontic reconstruction can be made permanent



air plasma spray a hydroxyapatite ceramic onto suitably prepared implant surfaces. Hydroxyapatite is a bio-

active ceramic because of its ability to bond chemically to bone tissue. Successful implementation of this advanced surface engineering technology by the Division of Materials Science and Technology (Mattek) promises an exciting new era for implantology in South Africa.

WEAVING OF SPECIALLY SHAPED PRODUCTS

A new weaving technique has been developed at the Division of Textile Technology (Textek) that makes it possible to weave specially shaped products on an ordinary jacquard loom. The Division has introduced special new computer-driven stop motions and yarn control mechanisms to the jacquard loom through

which the shape of the fabric can be altered during the weaving process. This new technology will, for instance, enable the textile industry to weave conical shaped products in one piece instead of having to shape them from sewn-together pieces of flat woven fabric.

President's and Executive Management's review

INFORMAL SETTLEMENTS ADVISORY GROUP

An interdivisional project involving the Divisions of Water Technology (Watertek), Building Technology (Boutek), Roads and Transport Technology (Transportek), and Information Services (Infotek), and focused on services for informal settlements resulting from rapid urbanisation was initiated in 1990. The researchers, mainly from the engineering and sociological



Watertek's Informal Settlements Advisory Group: From left to right are Baby Ramahotswa, Felipe Solsona, Patrick Mabokachaba, Ian Pearson and Dave Still.

are wrestling with the legal, social, technical, economic and political complexities related to the provision of basic

infrastructure in informal settlements in many parts of South Africa. They are regularly consulting with community leaders, authorities and settlement dwellers on their needs, aspirations,

policies and difficulties.

ELECTROMAGNETIC MINERAL EXPLORATION METHODS

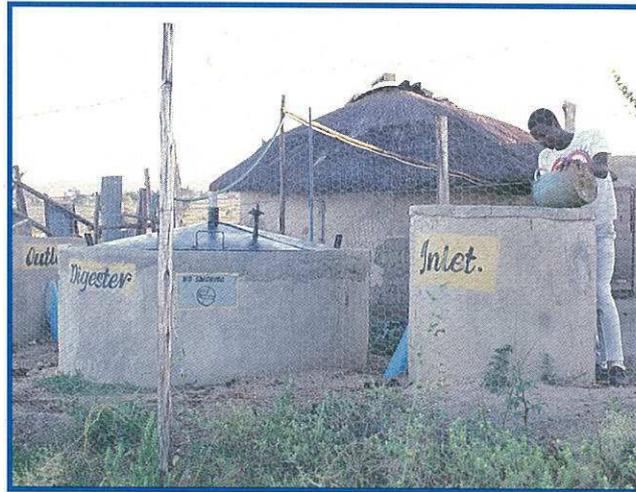
Over the past five years the Division of Earth, Marine and Atmospheric Science and Technology (Ematek) has developed theoretical aspects of electromagnetic techniques for exploration for natural resources, and has tested improved field and interpretation techniques in close co-operation with scientists from four other countries. The Division has been active in several exploration programmes in the search for gold, platinum and base metals in different geological

environments using these techniques. Such techniques have also been successfully applied in ground water exploration and to trace ground water contamination.

A new electromagnetic receiver unit, to be used with both shallow and deep commercially available and in-house developed exploration equipment, has been completed. Data capturing equipment has been developed together with the necessary software, and led to significant time savings in successful field surveys.

BLACK FAMILY RUNS OWN BIOGAS PLANT

In the village of Timbavati in the Eastern Transvaal the Mathabela family runs their own biogas production plant off cow dung and water to provide them with methane gas for cooking, heating and ironing. The plant is the result of a joint effort between the CSIR's Appropriate Technology



the Wits Rural Facility. The Mathabelas - a family of six adults and three children - were asked to indicate their commitment to the project by digging the hole in which the half-buried plant was to be erected. An interested and enthusiastic son, Freddie, and his brother are responsible for monitoring the plant.

DIGITAL TERRAIN MODELS FROM SATELLITE DATA

The CSIR receives resource data from four different satellite series. One of these is the French SPOT II satellite which also has the special feature of acquiring stereo pairs for cartographic and other applications. The illustration shown here is derived from a computer generated



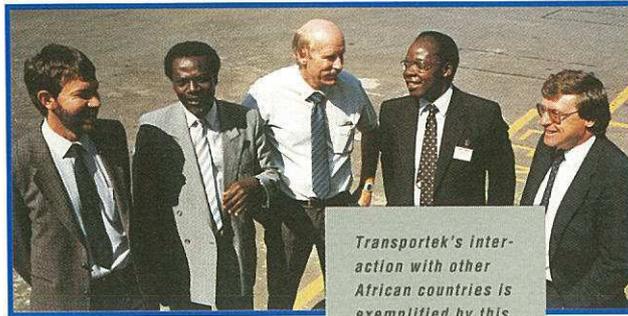
Digital Terrain Model (DTM) produced by the Satellite Applications Centre from a SPOT stereo pair. The image shows the topography as well as the surface features such as farmlands. The area shown is situated near Buffelspoort to the North of Brits.

President's and Executive Management's review

TECHNOLOGY APPLIED IN SUBCONTINENT

The Division of Roads and Transport Technology (Transportek) has served the transportation industry in southern Africa on a broad front. It has co-operated closely with its traditional clients, the national road authorities, at the highest level by assisting with the formulation of a national strategic management policy.

In the private sector, links with major industries, inter alia the Southern African Bitumen and Tar



Transportek's interaction with other African countries is exemplified by this photograph. From left to right are Chris van der Merwe, Gowa Nyasulu, Dr Phil Paige-Green, Mr Bernard Zingano, Principal Secretary of the Ministry of Works of Malawi, and Les Sampson.

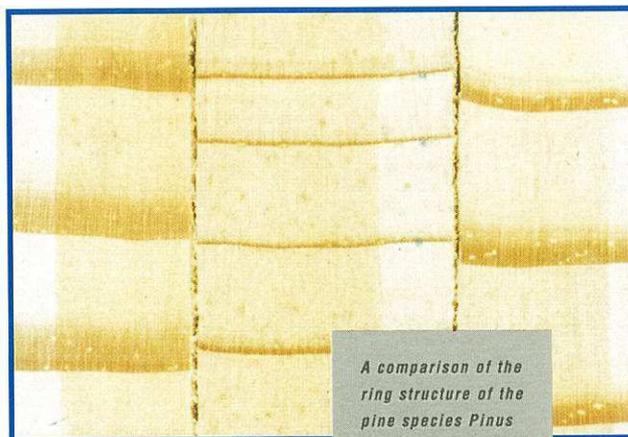
Association, have been fostered. The Division also addressed topical transportation issues such as the

combi-taxi industry and traffic safety. Its technical expertise and Africa-specific experience has found meaningful application in construction, rehabilitation, manage-

ment and safety projects undertaken in Malawi, Botswana and the TBVC states.

A PROMISING NEW PINE SPECIES

The main conifer in South Africa is *Pinus patula*, which is planted on about 240 000 ha. The Division of Forest Science and Technology (Forestek) has found *P. tecunumanii* to be a promising superior alternative for at least one-third of this area. Especially on productive, frost-free sites this new species displays a better growth rate than all other conifers presently used. Comprehensive wood property studies



*A comparison of the ring structure of the pine species *Pinus tecunumanii* (middle) with that of *P. patula* and *P. taeda*. The narrow bands of latewood of *P. tecunumanii* are especially noteworthy.*

carried out by Forestek revealed that *P. tecunumanii* is markedly less variable in wood density than *P. patula*

and other commercial species. This species also produces wood of a much lower latewood percentage without sacrificing total wood density. These results indicate that this new species will produce better structural timber

and a higher pulp yield per unit volume of clear timber than *P. patula*.

C o n t e n t s o f t h e F i n a n c i a l S t a t e m e n t s

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Balance Sheet

31 MARCH 1991

	Notes	1991 R'000	1990 R'000
Capital employed			
Capital account	2+6	551 125	540 787
General reserve	2+7	45 220	47 264
		596 345	588 051
Employment of capital			
Fixed assets	8	425 762	419 230
Investments	9	27 225	27 225
Net current assets		143 358	141 596
Current assets		233 727	220 351
Debtors and advances		47 105	49 358
Stock and Contracts in progress	10	23 483	15 749
Cash and short-term deposits		163 139	155 244
Current liabilities		90 369	78 755
Advances received		39 452	35 839
Creditors and accrued expenses	11	50 917	42 916
		596 345	588 051

A L MICHAU
Executive Vice-President

J B CLARK
President

The Annual Financial Statements of the CSIR, excluding the Cash Flow Statement and the Value Added Statement, have been audited in terms of section 5 and 18(2) of the Auditor General Act, No 52 of 1989, read with section 14(1) of the Scientific Research Council Act, No 46 of 1988, by external auditors under the supervision of the Auditor General. Subject to final review by the Auditor General, the annual financial statements are a fair presentation of the financial position of the CSIR as at 31 March 1991 and the results of its operations for the year.

Income Statement

31 MARCH 1991

	Notes	1991 R'000	1990 R'000
Income			
Parliamentary grant		266 726	255 006
Contract income		182 347	164 364
Interest		26 325	24 942
Sundry income		4 347	5 299
		479 745	449 611
Expenses			
Salaries	11	239 323	208 712
Depreciation		26 687	19 849
Running expenses		196 459	188 815
		462 469	417 376
Surplus for the year			
Adjustment for previous years	11	–	4 512
Surplus transferred to general reserve			
		17 276	27 723

Cash Flow Statement

31 MARCH 1991

	Notes	1991 R'000	1990 R'000
Cash received from external sources	12	286 985	290 947
Cash utilised in operating activities		216 630	221 073
Cash used in operations	13	249 088	232 376
Cash generated/(utilised) by a decrease/(increase) in working capital	14	6 133	(13 639)
Cash generated from interest income		26 325	24 942
Cash invested to maintain operations		43 140	53 776
Replacement of fixed assets	15	46 335	54 913
Less: Proceeds on disposal of fixed assets		3 195	1 137
Cash generated		27 215	16 098
Cash effects of financing activities		27 215	16 098
Funds transferred to the Foundation for Research Development		19 320	—
Increase in cash and short-term deposits		7 895	16 098
Cash utilised		27 215	16 098

Value Added Statement

31 MARCH 1991

	Notes	1991 R'000	%	1990 R'000	%
Value obtained	16	473 679	156	460 610	155
Paid to suppliers for goods and services		196 459	65	188 815	63
Value added		277 220	91	271 795	92
Interest earned		26 325	9	24 942	8
Total value created and received		303 545	100	296 737	100
Apportioned as follows:					
Employees					
• Salaries, wages and other manpower costs		239 323	79	208 712	70
Reinvested in activities					
• Maintenance of fixed assets		69 827	23	73 625	25
Depreciation		26 687	9	19 849	7
Acquisition of fixed assets		43 140	14	53 776	18
• Replacement of fixed assets	15	46 335	15	54 913	18
• Proceeds on disposal of fixed assets		3 195	1	1 137	—
Transferred to general reserves		17 276	6	32 235	11
Capital deficit	17	(22 881)	(8)	(17 835)	(6)
Total value apportioned		303 545	100	296 737	100

Notes to the Financial Statements

1. Accounting policies

The financial statements are prepared on the historical cost basis of accounting and in accordance with generally accepted accounting practice. Except as indicated the following principal accounting policies are consistent with those followed in the previous year:

Foreign currencies

Assets and liabilities in foreign currencies are converted to the South African rand at the rate of exchange ruling at year end. Conversion differences are dealt with in the income statement. Transactions during the year are converted to the South African rand at the rate of exchange ruling at date of payment, unless forward exchange contracts have been arranged. Forward exchange contracts are arranged for all material foreign liabilities as at year end.

Fixed assets

All assets costing R1 000 or less are written off when purchased. Land and buildings are stated at cost. No depreciation is provided on buildings. Equipment and vehicles are stated at cost less accumulated depreciation. These assets are depreciated at rates considered appropriate to reduce book values to one rand over the estimated useful life of the assets. This policy is deviated from in the case of the National Facilities, where equipment is stated at cost and no provision is made for depreciation.

Stock and Contracts in Progress

Raw materials and finished goods are stated at the lower of cost or estimated net realisable value. Cost is determined on the average method. Contracts and Work in Progress are stated at net realisable value. Net realisable value is calculated as a percentage of the sales value of work completed since the previous milestone.

Investments

Investments are stated at cost.

Income

Income and expenditure of a capital nature are not reflected in the income statement, but are accounted for directly in the Capital Account as set out in note 6.

Change in accounting policy

Unpaid bonuses (13th cheques) calculated *pro rata* for the period since previous payment to 31 March 1991 have been accrued. The change resulted in a reduction of the net surplus for the year, and adjustments to comparatives as set out in note 11.

Notes to the Financial Statements

2. Capital Employed

The accumulated funds and contract reserve at 31 March 1990 are restated in the Capital Account (note 6) and the General Reserve (note 7) as follows:

	R'000
Capital Account	540 787
General Reserve	47 264
– Before adjustment for previous years	52 221
– Adjustment for previous years	4 957
	588 051
Previously stated as	593 008
Accumulated funds	588 760
Contract Reserve	4 248
– Adjustment for previous years	4 957
	588 051

The restatement of these funds are more descriptive of the nature thereof.

3. Discontinued Operations

Foundation for Research Development

The Foundation for Research Development (FRD) became an independent council on 1 October 1990 in terms of the Research Development Act 1990 (No 75 of 1990). Assets and liabilities of the Foundation for Research Development were transferred to the new independent council on 30 September 1990 at book value as stated below. The 1990 comparatives reflect the assets and liabilities included in the CSIR Balance Sheet at 31 March 1990.

	30.9.90 R'000	31.3.90 R'000
Fixed assets	8 878	8 479
Net current assets	17 731	12 713
Current Assets	17 731	18 116
Debtors and advances	–	2 620
Cash and money on call	17 731	15 496
Current Liabilities	–	5 403
Advances received	–	189
Creditors and accrued expenses	–	5 214
	26 609	21 192

Notes to the Financial Statements

The results of the Foundation for Research Development for the six months ended 30 September 1990 and the full year comparatives for the year ended 31 March 1990 and included in the CSIR results are as follows:

	30.09.90	12 months ended 31.03.90
	R'000	R'000
Income		
Parliamentary grant	28 607	60 199
Contract income	2 758	10 231
Interest	1 452	3 202
Sundry income	25	6
	32 842	73 638
Expenses		
Salaries	2 381	4 556
Running expenses	31 241	57 804
	33 622	62 360
Surplus/(Deficit) for the period	(780)	11 278
Adjustment for previous years (note 11)	-	98
Surplus/(Deficit)	(780)	11 180

4. Post-Balance Sheet Event

The National Accelerator Centre, the South African Astronomical Observatory and the Radio Astronomical Observatory, collectively referred to as the National Facilities, gained independence from the CSIR on 1 April 1991 in terms of the Research Development Act 1990 (No 75 of 1990). Based on information available at the date of the accounts, the following assets and liabilities included in the CSIR accounts will be transferred to the Foundation for Research Development in respect of the National Facilities.

	1991 R'000
Fixed Assets	122 882
Net current assets/(liabilities)	(17)
Current Assets	1 324
Debtors and advances	613
Stock and Contracts in progress	655
Cash and money on call	56
Current Liabilities	1 341
Advances received	42
Creditors and accrued expenses	1 299
	122 865

Notes to the Financial Statements

The results of the National Facilities included in the CSIR results for the year ended 31 March 1991 are:

	1991 R'000
Income	40 537
Expenditure	32 348
Surplus included in the CSIR results	8 189

5. Capital Gain

The South African Forestry Research Institute was incorporated into the CSIR with effect from 1 April 1990. The value of assets transferred to the CSIR at that date is reflected in the Capital Account. (note 6)

6. Capital Account

	1991 R'000	1990 R'000
Balance at 31 March 1990	540 787	517 043
Plus: Assets of the South African Forestry Research Institute	1 347	–
• Cost	6 155	–
• Accumulated depreciation	4 808	–
Plus: Capital income	23 454	37 078
• Revenue	20 259	35 941
• Proceeds from sale of fixed assets	3 195	1 137
	565 588	554 121
Less: Assets relinquished	139	146
Assets written off	5 446	13 188
• Cost	13 285	21 785
• Accumulated depreciation	7 839	8 597
	560 003	540 787
Less: Assets relinquished to the Foundation for Research Development	8 878	–
– Building transferred for no consideration	6 243	–
– Equipment at cost	2 626	–
– Vehicles at cost	9	–
	551 125	540 787

Notes to the Financial Statements

7. General Reserve

	1991 R'000	1990 R'000
Balance at 31 March 1990	47 264	19 541
Less: Adjustment for previous years (note 11)	–	4 512
	47 264	15 029
Plus: Surplus transferred from income statement	17 276	32 235
• Before change in accounting policy	17 770	32 680
• Change in accounting policy (note 11)	494	445
Less: Funds transferred to the Foundation for Research Development	19 320	–
	45 220	47 264

8. Fixed Assets

	Cost 1.4.90 R'000	Additions R'000	Written off/ Adjustments R'000	Relinquished to		Cost 31.3.91 R'000	Accumulated depreciation R'000	Book value 31.03.91 R'000
				FRD	Other			
				R'000	R'000			
Land and buildings	144 829	6 927	3 289	6 243	–	142 224	–	142 224
Equipment	369 945	44 583	9 787	2 626	139	401 976	119 635	282 341
Vehicles	1 863	980	209	9	–	2 625	1 428	1 197
1991	516 637	52 490	13 285	8 878	139	546 825	121 063	425 762
1990	483 655	54 913	21 785	–	146	516 637	97 407	419 230

9. Investments

	% Holding	Value	
		1991 R'000	1990 R'000
South African Inventions Development Corporation	100	27 220	27 220
Woodchem (Pty) Ltd	50	5	5
		27 225	27 225

10. Stock and Contracts in Progress

	1991 R'000	1990 R'000
Stock	6 844	5 186
Contracts in Progress	16 639	10 563
	23 483	15 749

Notes to the Financial Statements

11. Effect of the change in accounting policy

	1991 R'000	1990 R'000
Net surplus before change	17 770	32 680
Unpaid service bonuses accrued for the year	494	445
Net surplus after change	17 276	32 235
Adjustment for years prior to 1990		4 512
– CSIR		4 004
– National Facilities		410
– Foundation for Research Development		98
Restated net surplus	17 276	27 723
Creditors and accrued expenses increased by	5 346	4 957

12. Cash received from external sources

	1991 R'000	1990 R'000
For funding of fixed assets	20 259	35 941
Parliamentary grant	20 061	34 776
Other sources	198	1 165
For funding of operational activities		
Parliamentary grant	266 726	255 006
	286 985	290 947

13. Cash used in operations

	1991 R'000	1990 R'000
Deficit/(Surplus) for the year before interest	9 049	(2 781)
– Before adjustment for previous years		(7 293)
– Adjustment for previous years		4 512
Adjusted for		
Parliamentary grant	266 726	255 006
Depreciation	(26 687)	(19 849)
	249 088	232 376

Notes to the Financial Statements

14. Decrease/(Increase) in working capital

	1991	1990
	R'000	R'000
Debtors and advances	2 253	(3 657)
Stock and Contracts in Progress	(7 734)	(10 585)
Advances received	3 613	(3 194)
Creditors	8 001	3 797
	6 133	(13 639)

15. Cash utilised for the replacement of fixed assets

	1991	1990
	R'000	R'000
Fixed Assets acquired	52 490	54 913
Less: Assets of the South African Forestry Research Institute acquired for no consideration	6 155	-
	46 335	54 913

16. Value obtained

	1991	1990
	R'000	R'000
Contract income	182 347	164 364
Sundry income	4 347	5 299
Parliamentary grant	266 726	255 006
Capital income	20 259	35 941
	473 679	460 610

17. Capital Surplus/(Deficit)

	1991	1990
	R'000	R'000
Capital income received	20 259	35 941
Proceeds from sale of fixed assets	3 195	1 137
Assets of the South African Forestry Research Institute	6 155	-
Less: Fixed assets acquired	52 490	54 913
	(22 881)	(17 835)

Relatório anual do C.S.I.R. - 1991 : Sumário

De modo geral, o ano de 1990 foi um ano difícil para a investigação sob contrato na África do Sul. A mudança nas prioridades governamentais deram origem a reduções drásticas sobretudo nos orçamentos da Defesa e da investigação energética. A depressão económica colocou sob pressão severa muitas organizações do sector privado e obrigou a cortes generalizadas nos orçamentos de investigação, sendo o sector mineiro um dos mais profundamente afectados.

Mau grado essa conjuntura negativa, o CSIR alcançou um aumento de vendas de 13,7 por cento em 1989/90, com um excedente de R20,2 milhões, mantendo deste modo a sua posição financeira segura apesar da conjuntura difícil, sendo um aspecto particularmente grato o aumento apreciável verificado no volume de contratos celebrados com a sector privado.

Em 1990 a Fundação para o Desenvolvimento da Investigação (Foundation for Research Development - FRD) foi cindido do CSIR, passando a funcionar como conselho estatutório independente sob a presidência e direcção dos Dres. C F Garbers e R R Arndt respectivamente.

O Dr Garbers demitiu-se da Presidência do CSIR em 30 de Setembro de 1990, sendo o seu sucessor, o Dr J B Clark, empossado em 1 de Outubro de 1990 no cargo de 6º Presidente do CSIR.

O ano transacto viu igualmente a inauguração duma nova Divisão do CSIR: a Divisão de Ciência e Tecnologia Florestais (Division of Forest Science and Technology - Forestek) após a tomada de direcção, por parte do CSIR, do Instituto Nacional de Investigação Florestal (South African Forestry Research Institute - SAFRI), até então dependente do Departamento de Assuntos Ambientais, fusão essa que encerrou a actividade da Divisão de Tecnologia de Processamento e de Fabricação Química (Division of Processing and Chemical Manufacturing Technology), cujas actividades de processamento de madeiras passam a depender da Forestek enquanto a suas actividades de investigação química foram absorvidas pelas Divisões de Ciência e Tecnologia de Materiais (Mattek) e de Tecnologia de Água (Watertek). As actividades de investigação têxtil passam a depender doutra unidade estratégica nova, a saber, a Divisão de Tecnologia Têxtil (Division of Textile Technology - Textek), com sede em Port Elizabeth.

O CSIR acaba de investir num esforço coordenado em prol do desenvolvimento e aplicação de tecnologias no contexto das zonas de povoamento informais e semiformais, campanha essa que fará incidir as habilidades, pericia e recursos das quatro unidades estratégicas sobre a problemática da provisão de infraestruturas dentro das referidas áreas. A investida "África Adentro" do CSIR foi coroado de êxito com o estabelecimento de actividades do CSIR em vários países africanos, por ex. a manutenção de estradas no Maláwi e no Botswana - exploração de diamantes na Namíbia - investigação de desmoronamentos de prédios na Zâmbia. Sem mencionar já o prestígio já granjeado pelo CSIR enquanto consultor junto ao Banco Mundial, actividade essa que há-de certamente servir de estímulo para ultteriores actuações do CSIR ao serviço de países africanos independentes.

A instauração duma rede local de computadores de alta velocidade interconectadas ao serviço das unidades estratégicas vem reforçar consideravelmente a eficácia das comunicações internas do CSIR. Os novos sistemas de informática actualmente em desenvolvimento em apoio dos serviços administrativos e de gerência do CSIR hão-de facilitar ainda mais a tomada de decisões de planificação efectivas.

O efectivo do CSIR foi reduzido de 4 126 em Abril de 1990 a 3 788 em Março de 1991. Os factores que mais fortemente contribuíram para esta flutuação foram a incorporação do Instituto Nacional de Investigação Florestal (com um pessoal de aproximada-

mente 200 pessoas) em Setembro de 1990 e, posteriormente, a secessão da Fundação para o Desenvolvimento da Investigação (aproximadamente 400 pessoas) em Outubro de 1990.

Durante o ano em curso, expiraram os períodos de serviço de vários membros do Conselho. O Dr C van der Pol e o Sr J A Stegmann serviram como membros de Conselho durante doze e seis anos respectivamente. Tenho a honra de acolher como novos membros o Sr P du P Kruger, da Sasol, e o Dr G s Sibiyi, a partir respectivamente de 28 de Janeiro de 1991 e de 1 de Janeiro de 1991. O Presidente actual do Conselho do CSIR, o Dr L Alberts, demitir-se-á no dia 30 de Junho de 1991, e o Dr D R Woods no dia 31 de Maio de 1991. O Sr Kruger passará a desempenhar as funções de Presidente a partir do dia 1 de Julho.

Anuncia-se também que os Sres D L Keys, Presidente Executivo da Gencor e J C Hall, Director Executivo da Barlow Rand, se juntarão ao Conselho de Administração da CSIR a partir de 1 de Junho e de 1 de Julho de 1991, respectivamente.

Em Agosto de 1990 o Dr Louw Alberts na sua qualidade de Presidente do Conselho de Administração do CSIR apresentou ao Presidente do Estado, Sr F W de Klerk, o primeiro exemplar dum livro entitulado *The CSIR - the First 40 Years*, que trata do período 1945 - 1985. Este livro, que constitui um tributo à clarividência, aptidão organizadora e dedicação excepcionais dos legisladores responsáveis e às gerações de cientistas e engenheiros de craveira que formaram o CSIR, foi produzido pela própria oficina editora do CSIR - Scientia Printers - e constitui um produto de alta qualidade do qual o CSIR se pode orgulhar justificadamente.

Pontos Altos

Hoje em dia o CSIR recorre a uma variedade de publicações dedicadas às unidades estratégicas para fazer publicidade sobre os resultados das investigações empreendidas. De entre as realizações das catorze unidades estratégicas durante o ano transacto, destacamos:

- Pesquisas sobre o Movimento de Ar Aquecido dentro de um Túnel de Água
- Avião Teleguiado SKYFLY de Treino de Tiro ao Alvo
- O Mundo Novo da Fotointerpretação Aérea
- O Projecto de Fabricação Delft
- A Predição das Vendas Potenciais
- Técnicas de Prospecção Electromagnética de Minérios
- Acordos de Licenciamento FBC
- A Produção de Malte em Escala Experimental
- Novos Produtos a Base de Soja
- Centro de Informações sobre Materiais
- Materiais Adesivos Biomédicas
- Lâmpada Pisca-Pisca de Emergência para Automóveis, de Concepção Local
- A Tecelagem de Produtos de Configurações Tridimensionais Especiais
- Grupo Consultivo sobre Povoamentos Informais
- Uma Família Africana Administra o seu Próprio Engenho Gerador de Biogás
- Modelos Digitais do Terreno a Base de Dados Recolhidos por Satélite
- A Aplicação da Tecnologia no Subcontinente
- Uma Nova Espécie de Pinho, Prometedora

Para mais pormenores sobre quaisquer destes assuntos, contactar: CSIR Corporate Communication, P O Box 395, Pretoria 0001, South Afr. ica.

CSIR – Rapport annuel 1991 : Résumé

En général, 1990 a été une année difficile pour la recherche sous contrat en Afrique du Sud. Les priorités du gouvernement ont changé, ce qui a amené de fortes réductions de crédits, en particulier dans les secteurs de la défense et de l'énergie. La mauvaise santé de l'économie a exercé une pression supplémentaire sur de nombreuses entreprises privées, entraînant une réduction des crédits pour la recherche dans tous les secteurs. Cette réduction a été particulièrement sévère dans l'industrie minière.

Malgré les conditions économiques défavorables, le CSIR a terminé l'année 1989/1990 avec une augmentation des ventes de 13,7% et un surplus de trésorerie de 20,2 millions de Rands, conservant ainsi une situation financière saine malgré des circonstances difficiles. Il est particulièrement agréable de constater un accroissement des contrats avec le secteur privé.

1990 a vu la séparation de la Foundation for Research Development (FRD) et du CSIR. Depuis le 1er octobre 1990, la FRD est un conseil statutaire indépendant. Le docteur C F Garbers et le docteur R R Arndt ont été nommés respectivement Président du Conseil en Président de la FRD indépendante.

Le docteur Garbers a pris sa retraite le 30 septembre 1990. Le docteur J B Clark lui a succédé le 1er octobre 1990; il est le sixième Président du CSIR.

L'année dernière a également vu le lancement de la nouvelle Division of Forest Science and Technology (Forestek) suivant la prise de contrôle de la South African Forestry Research Institute (SAFRI) qui était sous la tutelle du Department of Environmental Affairs. Cette fusion a entraîné la cessation des activités de la Division of Processing and Chemical Manufacturing Technology. Ses activités de recherche relatives aux industries du bois font maintenant partie de Forestek alors que les activités de chimie ont été absorbées par les Divisions of Materials Science and Technology (Mattek) et Water Technology (Watertek). Les activités de recherche textile font maintenant partie d'une autre nouvelle division, la Division of Textile Technology (Textek) située à Port Elizabeth.

Le CSIR a investi dans le développement et la mise en oeuvre de technologies relatives aux zones de peuplement officiel ou semi-officiel. Ceci allie les compétences, expertise et ressources de quatre Divisions afin d'aider à l'établissement de l'infrastructure dans ces zones. Cette poussée "vers l'Afrique" a amené le CSIR op à opérer avec succès dans plusieurs pays africains: entretien de routes au Malawi et au Botswana, recherche de mines diamantifères en Namibie et enquête sur des défauts de construction en Zambie. Le CSIR est maintenant enregistré comme expert conseil auprès de la Banque Mondiale; ceci devrait aider à amener davantage de contrats dans le pays d'Afrique.

L'installation d'un réseau de communication local par ordinateurs entre la plupart des unités d'opération a fortement amélioré les communications à l'intérieur du CSIR. Divers systèmes d'information sont en cours de développement; ils faciliteront les prises de décisions.

Le personnel du CSIR, qui était de 4126 en avril 1990 et tombé à 3788 en mars 1991. Les raisons principales de ce changement sont l'incorporation du South African Forestry Research Institute (environ 200 personnes) en septembre 1990 et sécession de la Foundation for Research Development (environ 400 personnes) en octobre 1990.

Durant l'année, les charges de plusieurs membres du conseil d'administration sont arrivées à terme. Le docteur C van der Pol et monsieur J A Stegmann ont été membres du conseil d'administration pendant douze et six ans respectivement. C'est avec plaisir que j'accueille les nouveaux membres du conseil, monsieur P du P Kruger de Sasol (28 janvier 1991) et le docteur G S Sibiyi (1 janvier 1991). L'actuel Président du Conseil, le docteur L Alberts prend sa retraite le 30 juin 1991 et le professeur D R Woods quitte le conseil d'administration le 31 mai 1991. Monsieur Kruger deviendra Président du Conseil le 1er juillet 1991.

En août 1990, le docteur Alberts, en tant que Président du Conseil d'Administration du CSIR, a offert au Président de la République, monsieur F W de Klerk, le premier exemplaire du livre "Le CSIR, les quarante premières années", écrit par le docteur D G Kingwill. Le livre couvre la période 1945-1985. Il rend hommage à la clairvoyance des législateurs, à ceux qui ont fait preuve d'une motivation et de talents d'organisation exceptionnels, aux générations de chercheurs et ingénieurs doués et dévoués. Ce livre a été édité et imprimé par le département Scientia Printers du CSIR. C'est une oeuvre de qualité dont l'organisation est, à juste titre, fière.

Faits marquants.

Le CSIR produit de nombreuses publications afin de rendre publiques les résultats de ses recherches. Voici quelques titres de l'année écoulée pour les quatorze unités d'opération:

- Etudes de l'air chaud dans un tunnel à eau.
- L'avion-cible SKYFLY.
- L'interprétation de photos aériennes.
- Le projet Delft.
- Prédiction des ventes potentielles.
- Méthodes électro-magnétiques d'exploration des minéraux.
- Accords de licence FBC.
- Maquette pilote de maltage.
- Nouveaux produits à base de soya.
- Centre d'information des matériaux.
- Liens bio-médicaux.
- Centrale clignotante pour automobiles.
- Tissage de produits aux profils particuliers.
- Groupe conseil en peuplements non officiels.
- Une famille noire possède sa propre unité génératrice de biogaz.
- Modèles digitaux de terrains à base de données de satellites.
- La technologie appliquée dans le sous-continent.
- Une nouvelle espèce de pin pleine de promesses.

De plus amples détails sur tous ces sujets peuvent être obtenus en écrivant au CSIR, Corporate Communication, P O Box 395, Pretoria 001, République Sudafricaine.

Jahresbericht 1991 des CSIR : Zusammenfassung

Im Allgemeinen war 1991 ein hartes Jahr für kontraktuelle Forschung in Südafrika. Veränderte Prioritäten der Regierung führten zu scharfen Budgetschnitten besonders auf den Sektoren der Verteidigungs- und Energieforschung. Die Abwärtsneigung der Wirtschaft setzte auch viele Privatunternehmen unter starken Druck, was auf der ganzen Linie zu Schnitten in den Ausgaben für Forschung führte. Diese Schnitte waren besonders durchgreifend auf dem Bergbausektor.

Trotz der schlechten Wirtschaftslage beendete der CSIR das Jahr mit einem totalen Verkaufswachstum von 13,7%, verglichen mit 1989/90, und einem Überschuss von 20,2 Millionen Rand. Hiermit behauptete der CSIR seine gesunde finanzielle Lage unter schwierigen Bedingungen. Besonders erfreulich war die Zunahme von Kontraktverkäufen an den privaten Sektor.

Das Jahr 1990 sah die Ausgliederung der Stiftung für Forschungsentwicklung [Foundation for Research Development (FRD)] aus dem CSIR. Am 1. Oktober 1990 begann die FRD als unabhängige Körperschaft des öffentlichen Rechts zu funktionieren. Dr C F Garbers und Dr R R Arndt wurden als Vorsitzender bzw. Präsident der FRD angestellt.

Dr Garbers trat am 30. September 1990 als Präsident des CSIR zurück und sein Nachfolger wurde Dr J B Clark als sechster Präsident dieser Organisation.

Das vergangene Jahr sah auch die Schaffung einer neuen Abteilung des CSIR, nämlich der Abteilung für Forstwissenschaft und -technologie (FORESTEK), nachdem das bisherige Südafrikanische Forschungsinstitut für Forstwesen (SAFRI) des Staatsdepartements für Umweltfragen dem CSIR angegliedert worden war. Dieser Zusammenschluss führte zur Auflösung der Abteilung für Verfahrenstechnik und chemische Industrietechnologie. Die Tätigkeiten dieser Abteilung auf dem Forschungsgebiet der Holzverarbeitung bilden nun Teil der FORESTEK, während die Chemieforschung von den Abteilungen für Materialwissenschaft und -technologie (MATTEK) und Wassertechnologie (WATERTEK) übernommen wurden. Textilforschung bildet nun Teil einer anderen neugeschaffenen strategischen Einheit, nämlich der Abteilung für Textiltechnologie (TEXTEK), die in Port Elizabeth stationiert ist.

Der CSIR nimmt teil an einem koordinierten Vorstoss zur Entwicklung und Anwendung von Technologie bei unregulierter und halbregulierter Besiedlung. Diese neue Aufgabe vereinigt die Kenntnis, Erfahrung und Hilfsmittel von vier strategischen Einheiten, um die Schaffung einer Infrastruktur in derartigen Siedlungsgebieten zu unterstützen. Dieser "Vorstoss nach Afrika" ergab auch erfolgreiche Tätigkeit des CSIR in einer Anzahl afrikanischer Staaten, z.B. Strasseninstandhaltung in Malawi und Botswana, Schürfarbeiten für Diamantminen in Namibia und Untersuchung von Gebäudeschäden in Sambia. Die Stellung des CSIR als ein neuerdings bei der Weltbank registrierter Konsultant sollte als weiterer Antrieb für ihre Arbeit in afrikanischen Ländern dienen.

Die Einrichtung eines schnellen örtlichen Gebietsnetzwerks, das den meisten der strategischen Einheiten zur Verfügung steht, hat die Wirksamkeit der internen Verbindungen des CSIR erheblich verstärkt. Systeme zur Information des Managements werden entwickelt und sollen wirksame Entscheidungsfindung weiterhin fördern.

Der totale Personalbestand des CSIR wurde von 4126 im April 1990 auf 3788 im März 1991 vermindert. Die wichtigsten Faktoren, die zu dieser Schwankung

beitrugen, waren erstens, die Einverleibung des Südafrikanischen Forschungsinstituts für Forstwesen (etwa 200 Mitarbeiter) im September 1990, und danach die Ausgliederung der Stiftung für Forschungsentwicklung (etwa 400 Mitarbeiter) im Oktober 1990.

Im Laufe des Jahres ging die Amtsperiode einiger Ratsmitglieder zu Ende. Dr C van der Pol und Dr J A Stegmann dienten dem Rat für zwölf bzw. sechs Jahre. Ich freue mich, Herrn P du P Kruger von SASOL und Dr G S Sibiyi als neue Ratsmitglieder ab 28. Januar 1991 bzw. 1. Januar 1991 begrüßen zu dürfen. Der gegenwärtige Vorsitzende des Rates, Dr L Alberts, wird am 30. Juni 1991 zurücktreten und die Amtsperiode von Prof D R Woods endet am 31. Mai 1991. Herr Kruger wird am 1. Juli den Vorsitz übernehmen.

Es wurde auch angekündigt, dass Herr D L Keys, Exekutiver Vorsitzender von GENCOR, und Herr J C Hall, Exekutiver Direktor von BARLOW RAND dem Rat am 1. Juni 1991 bzw. am 1. Juli 1991 beitreten werden.

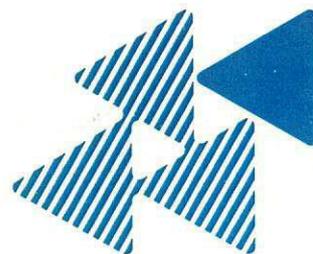
Im August 1990 überreichte Dr Alberts als Vorsitzender des CSIR dem Staatspräsidenten, Herrn F W de Klerk, die erste Kopie eines Buches mit dem Titel "The CSIR - the first 40 years" von Dr D G Kingwill. Das Buch handelt über den Zeitabschnitt von 1945 bis 1985. Es ist ein Tribut an die Weitsicht von Gesetzgebern und an Menschen mit ausserordentlicher Motivierung und Organisationsfähigkeit wie auch an Generationen hingebender und talentierter Wissenschaftler und Ingenieure. Das Buch wurde von Scientia Printers, dem CSIR-eigenem Verlag, herausgegeben und ist ein Qualitätsprodukt, auf das die Organisation mit Recht stolz sein darf.

HÖHEPUNKTE

Der CSIR benutzt heutzutage eine ganze Reihe von Veröffentlichungen der korporativen und strategischen Einheiten um die Ergebnisse seiner Forschungen zu bekannt zu machen. Einige der von den vierzehn Einheiten während des vergangenen Jahres veröffentlichten Titel waren:

- Warmluftstudien in einem Wassertunnel
- SKYFLY Zielscheibenroboterflugzeug
- Auswertung von Luftaufnahmen kommt zu seinem Recht
- Das Projekt DELFT
- Voraussage möglicher Verkäufe
- Elektromagnetische Mineralschürfmethode
- FBC Lizenzvereinbarung
- Versuchsverfahren für das Mälzen
- Neue Sojaprodukte
- Materialinformationszentrum
- Biomedizinische Bindung
- Örtlich entwickelte Blinklichteinheit für Autos
- Weben von Produkten mit besonderer Form
- Beratungsgruppe für unregelmäßige Besiedlung
- Schwarze Familie betreibt ihre eigene Biogasanlage
- Digitale Bodenmodelle aus Satellitenaufnahmen
- Technologie im Subkontinent angewandt
- Eine vielversprechende neue Pinienart

Volle Einzelheiten von jedem dieser Themen sind erhältlich bei CSIR Corporate Communication, P O Box 395, Pretoria 0001 South Africa.



CSIR