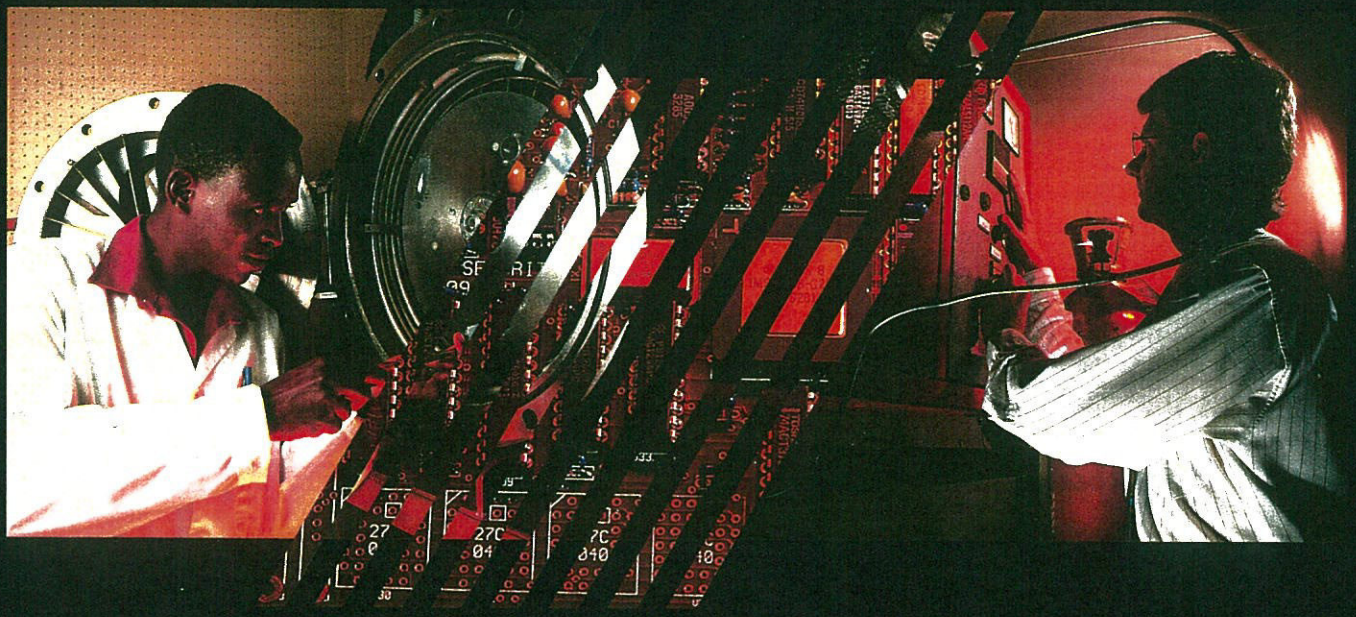
ANNUAL REPORT • TECHNOLOGY IMPACT



1993

CSIR

ANNUAL REPORT

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CSIR

CSIR Board

From left to right:

Dr J B Clark (President)

Mr L Boyd

Mr J C Hall

Dr L B Knoll

Mr R A Plumbridge

Mr P du P Kruger (Chairman)

Dr G S Sibiya

Mr E van As

Mr W C van der Merwe

Dr W P Venter

Dr H B Dyer † 5-3-1993

CHAIRMAN'S REVIEW

The liberation of all South Africans from past political and economic impediments is leading to the concomitant phasing out of sanctions and the re-admittance of South Africa into the world community.

Foreign markets are opening up for South Africa. But, at the same time, external competition in the South African market place is likely to become increasingly intense. Coupled to this, we are confronted by the globalisation of world markets and the diminishing role of raw materials. To exploit these opportunities and meet the challenges from abroad head-on, South African industry will have to become more competitive in a global context. The economic isolation of the past has blunted the competitiveness of many local industries and businesses. South Africa has well developed infrastructures in many areas, but in other areas they are inadequate. These include housing and housing related services, lines of communication, roads and transport systems and, especially, education. Competitiveness depends, among other things, on factors such as technology, access to resources and a country's tax structure. The quality of the available human resources, with the right qualifications, skills and attitudes, remains a crucial dimension of the competitiveness equation.

Research by the CSIR and a variety of overseas institutions including the OECD and MITI, has clearly indicated that a nation's competitiveness is, in the main, determined by its ability to deploy new knowledge through commercialised technology to fulfil needs in the market place.

The future challenge for the CSIR is to build on its successes and produce more of the same while becoming a world class technology provider in a new order in South Africa and increasing dynamism internationally.

Contrary to conventional wisdom which believed that basic research and the knowledge thereby created automatically lead to applied research which is in turn followed by technology, a nation need not be involved in basic research at all to become technologically superior. Moreover, basic knowledge does not guarantee technological superiority. All over the world raising levels of skills and training are a focus of significant attention, and innovation in technology is a prerequisite to the success of companies and nations.

The global socio-political trends that affect knowledge-intensive research and development, and technology advances, include reduced military spending; a growing emphasis on economic competitiveness; changing natural biogeological cycles; a growing gap in rich and poor living standards; and divergent trends in the use of primary energy and natural resources used per unit of GNP. These trends are irreversible and accelerating.

To quote Harvey Brooks of Harvard University, the challenge to human civilisation that must be met within 50, or, at the very most, 100 years, is how to utilise the capacity for rapid technological change that exists in the areas where it will be most beneficial for humanity collectively. In South Africa, as it approaches a new era in its history, the challenge is awesome.

Improved competitiveness and quality in industry in the international arena, and enhanced quality of life in all communities in South Africa, require technological solutions.

The CSIR finds itself in the very fortunate, but also very demanding position of being a central role player in the provision of those technologies which are crucial to the well-being of not only this country, but also the whole of Sub-Saharan Africa. Despite being effectively isolated from the international scientific and technological community for so long, this organisation boasts a proud past and many scientific and technological achievements of international renown.

The future challenge for the CSIR is to build on these successes and produce more of the same while becoming a world class technology provider in a new order in South Africa and increasing dynamism internationally.

This will, however, be impacted by the outcome of ongoing negotiations in the political arena and the National Economic Forum and other platforms. We trust that these negotiations will eventually lead to the development of a well considered and integrated suite of policies, such as industrial, economic, technology and education policies - a framework for the CSIR within which to fulfil its partnership role with government, industry and the community it serves.

I would like to pay a special tribute to Dr H B

Dyer, who passed away on 5 March 1993 after serving as a CSIR Board Member since 13 October 1986. His invaluable contributions towards the activities of the Board, especially during the restructuring of the CSIR which started in the late 1980's, were always a highlight of Board meetings. He will be sorely missed.

We also welcome Mr Les Boyd, who joined the Board during the past financial year. I am sure that his special expertise and broad experience will serve the Board for many years to come.

In conclusion, I would like to thank my fellow Board members for their continued support and for sharing their considerable business experience with the CSIR top management. It gives me great pleasure to congratulate and thank, most sincerely, on behalf of the Board and our many stakeholders, our President, Dr Brian Clark, and his colleagues for their dedicated contributions to the objectives of the CSIR.

P DU P KRUGER

From left to right:

Dr J B Clark

(President)

Mr R F Camphor

(Executive Vice President: Human

Resource Services)

Dr G G Garrett

(Executive Vice President:

Operations)

Mr M D Groch

(Executive Vice President:

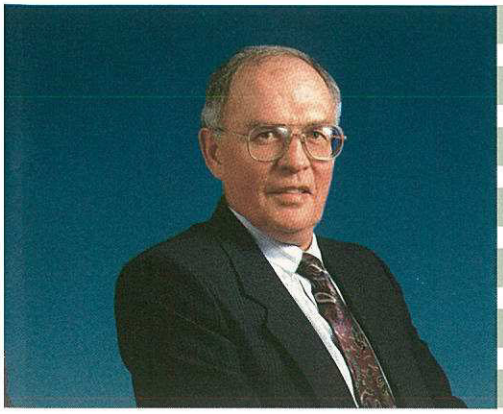
Marketing & Business Development)

Dr D F Toerien

(Executive Vice President:

Operations)

EXECUTIVE MANAGEMENT'S REVIEW



South African society is continuing to undergo a process of social and economic transformation. Our progression towards a new order will make special and, at times, apparently conflicting demands of South Africans. Equally, this will apply to the practice of science and technology.

Duality of technology challenges for South Africa

The total research and development (R&D) effort in South Africa is at present challenged by a duality between the need for social upliftment on the one hand and economic growth on the other. The allocation of funds between these two equally important areas needs to be directed according to national priorities, which themselves will be the product of the emerging new socio-political order for the country.

At face value, with limited funding available for allocation, it is expected that significant tensions will exist in the distribution of resources between the provision of social services such as health, education and community development, as well as basic social infrastructural needs such as housing, roads, electricity, water and communication on the one hand and industrial and business needs for infrastructure and technology development on the other.

The real challenge for South Africa and the CSIR group remains, therefore, to respond effectively to the changing demands of "technology for development" and "technology for competitiveness" and to avoid becoming ineffective in meeting the needs of our communities and, increasingly uncompetitive in global markets.

Responsiveness

Effective technology management involves players at three levels - the international community, government and individual organisations. Against the background of global R&D trends, where technological change is occurring at a breathtaking pace; where the generic impact of Information Technology is increasingly a dominant factor; and where the increasing cost and complexity of high technology is recognised, the need for greater collaboration and pooling of resources and the importance of interdisciplinary technology, not only between companies but also nations, are becoming the norm rather than the exception.

This holds an important lesson for South Africa as we re-enter the international playing field and for African countries when it comes to addressing intra-regional technology issues.

At the CSIR we recognise the need to strengthen linkages between ourselves as a technology provider and the formal and informal sectors of industry, developing communities and decision makers as the technology users. This linkage has to do with competitive industrialisation, commercialisation and the use of technology which are the cornerstones of the CSIR's business.

The IDRC study

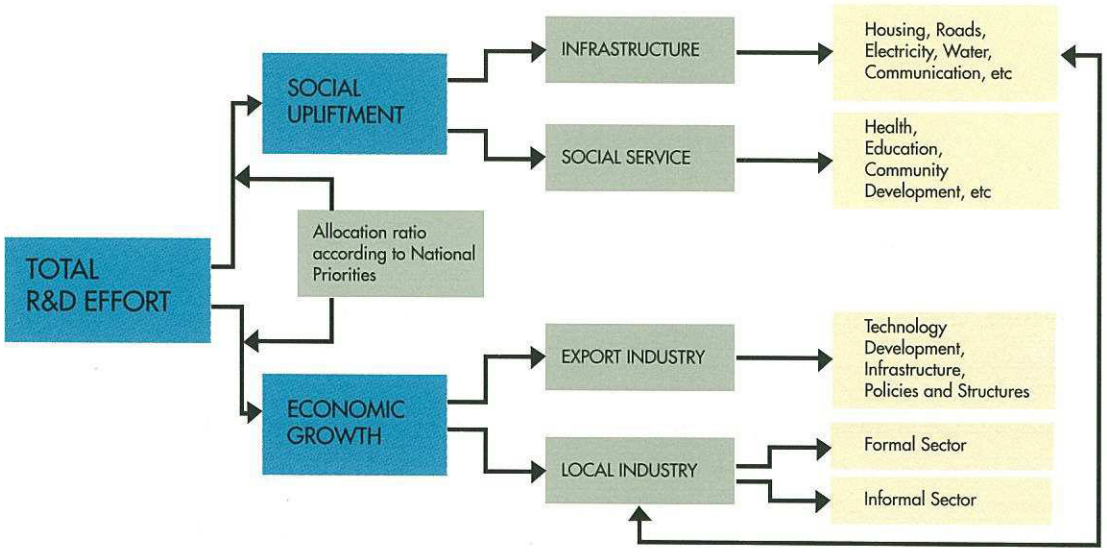
An assessment of science and technology policies in South Africa - Towards A Science and Technology Policy for a Democratic South Africa - was undertaken by the Canadian International Development Research Centre (IDRC), with the ANC, COSATU and SANCO as patrons, during the latter part of 1992 and early 1993.

Apart from making important general observations about the complexity of the issues relating to the development of effective national science and technology policies, the study identified the lack of national priorities for science and technology, which are in line with the changing realities of South Africa. The final assessment of the CSIR was constructive and provided management with valuable inputs on changes required to balance our activities.

They recognised our strategic management processes as being on a par with international contract research organisations of substance. They acknowledged our major transformation from what we were in the 1980s to what we are today and noted that we have a major opportunity to contribute to the economic and social well-being of South Africa.

They noted our commitment through our mission statement to industry, decision makers and developing communities. They reported that even when measured in international terms, we have done well in working with big industry. But, according to the report, we must proceed and build more momentum with our initiatives in relation to working with small to medium enterprises and with developing communities.

These findings broadly mirror our own views. There is no doubt that these markets will become increasingly important in the years to come, both in terms of our commitment to strengthening our



own country's socio-economic welfare and our international role in Africa. Management has taken a number of strategic initiatives to build further momentum in these areas during 1993.

Economic and other changes

During the past year the recession in South Africa continued, becoming the longest ever experienced in this country. Breakdown in political negotiations and mass action were major contributing factors in prolonging and deepening the economic downturn. These led to a decline in business confidence among consumers and both local and foreign investors. Fixed investment in South Africa declined further and the private sector was obliged to focus even more than before on cost reduction and the improvement of productivity. This reduced the capacity of the private sector to fund contract research aimed at developing new processes and products and shortened the time horizons for whatever contract research was undertaken.

General finances

The 1993 financial year has evidenced the passing of the last phase in the progression towards preparing annual financial statements, which are as for a commercialised entity. The financial statements are a separate part of this Annual Report and no further comment will be made here other than to advise that these financial statements comply with generally accepted accounting practice, the Companies' Act 4th Schedule and other relevant sections and the Reporting of Public Entities Act.

Corporate goals

For 1992/93, the CSIR set corporate goals for itself in terms of technology management, sales and finance, income from products, processes and services launched and strategic quality management.

The first corporate technology management plan was completed by August 1992 and, based on the insights gained from this, each CSIR Division and all Corporate Programmes revised their technology plans by the end of March 1993.

A depressed economic climate prevented the CSIR from achieving its goal of R240 million in external contract income in the 1992/93 financial year. The R208,8 million that was realised

represents an increase of 6,1 per cent on the previous year.

Corporately funded expenses were 11,5 per cent of turnover. The 1993/94 budget will restrict these expenses to 10 per cent of turnover.

All divisions completed the development cycle of the CSIR's product development system for four new products, while nine divisions succeeded in achieving the stated goal of a minimum of five products. As a whole, the CSIR launched thirteen products into the market place and earned the first income from this process by August 1992. External income from new products launched will be 10 per cent of total turnover in 1993/94.

The Customer Satisfaction Programme component of Strategic Quality Management was fully implemented, and the CSIR achieved a 94 per cent customer satisfaction rating by March 1993.

The CSIR's new project management system was fully implemented throughout the CSIR. With the necessary training intervention, personnel involved in project management activities were utilising this system by March 1993.

International strategy

In the last two years we have had the privilege of interacting with agencies of several foreign governments who, in the past, classified the CSIR as an organisation which, owing to its parastatal status, was denied access to certain technologies and bilateral/multilateral funding streams. We have worked hard, and with success, at changing the views and perceptions about the CSIR among key players in international agencies.

The CSIR's international strategy also called for a purposeful effort to rebuild networks, disrupted by sanctions, between scientists, engineers and technologists. A special highlight in this arena was the visit to Germany by a CSIR delegation at the invitation of the German Bundesministerium für Forschung und Technologie (BMFT). The visit was aimed at gaining an insight into the policy, management and leadership aspects of science and technology and the establishment of first level contacts with a range of selected organisations. The delegation was led by Dr Adi Paterson and its members represented four major fields: materials science and production technology, information technology, biotechnology and environment and natural resources.

A delegation from the CSIR also formed part of the party of the Minister of Finance during his visit to Taiwan in November. Senior managers from the CSIR also visited the USA, Korea, Japan, Switzerland, Australia, Sweden, Uruguay, Belgium, Netherlands, Kenya, Botswana, Canada, New Zealand, Israel, Spain, France, Germany and Taiwan.

The CSIR also received many foreign visitors during the year, including international dignitaries of repute, such as Prof James Watson, Nobel Prize Winner and Director of Cold Spring Harbor Laboratory (NY), one of the most renowned research institutes in the world. Gary Hamel, Associate Professor of Strategic Management at the London Business School, and Peter Schwartz,

In the words of Mr Babacar Ndiaye, President of the African Development Bank, "Sustainable development in a country is impossible without a technological development capability indigenous to that country".

President of Global Business Network, made important contributions to our management processes.

The central message gathered from these visits and other contacts with the international science and technology community and various funding and aid agencies was that the CSIR is again being accepted as a player of consequence, especially in terms of the important role we can play as an African technology provider.

It is becoming increasingly clear that South Africa, as a key role player, will be required to make a significant contribution to the development of the entire Southern African region. The CSIR has positioned itself to fulfil this "funnel and bridge" function in partnership with the countries in Africa. In the words of Mr Babacar Ndiaye, President of the African Development Bank, "Sustainable development in a country is impossible without a technological development capability indigenous to that country".

By and large, the CSIR's projects in countries such as Botswana, Namibia, Mauritius, Zambia, Lesotho, Madagascar, Zimbabwe, the Seychelles, Kenya, Malawi, the Congo, Cape Verde and Tanzania, are aimed at the basic infrastructure development and rehabilitation and upgrading thereof.

Financing is provided by various local and international funding agencies. A key factor in these projects is community involvement, to assess the real needs, facilitate the development of management and administration, technical skills and infrastructure to absorb technology-based development solutions. Without this, such projects cannot be expected to succeed.

Co-ordination committees involving the CSIR and representatives of Government departments are active in regional projects such as the supply of water in Zimbabwe. At the same time we are liaising extensively with major international funding agencies such as the World Bank, for which the CSIR recently completed a road rehabilitation project in Malawi.

Organisational Development

In order to improve our track record in providing technology to South African industries, the CSIR undertook a detailed analysis of its linkages with the manufacturing and mining sectors of industry during 1992.

A strategy to redress current deficiencies at the interface between the CSIR and customers in these sectors was approved by the CSIR Board and led to the restructuring of two CSIR Divisions - the former Divisions of Aeronautical Systems Technology and Production Technology - which were merged into a single Division of Manufacturing and Aeronautical Systems Technology (Aerotek).

The second development flowing from this strategy was the merging of the Chamber of Mines Research Organisation (COMRO) with the CSIR to form a new force in mining research and development in Southern Africa. The merger has led to the creation of a thirteenth strategic unit, the Division for Mining Technology. This is expected

to yield major synergistic benefits for both the CSIR and the mining industry. The merger provides the CSIR with a much stronger and broader base of services to this industry and will, through integration with the CSIR's existing R&D capabilities, ultimately result in a more comprehensive technology offering to mining and mining related organisations.

In order to address the increasing importance of the informal sector for the South African economy, and especially the so-called small, medium and micro enterprises, a second study was commissioned by the CSIR Board during 1992 with the aim of positioning the CSIR as a technology source for this sector. This initiative will draw on the best local knowledge and appropriate international experience to formulate an effective and resilient strategy on small, medium and micro enterprises, specifically on how to effect technology transfer to them.

This drive links up with the CSIR's increasingly important role in urban and rural developing communities. In the past year a new Corporate Programme, Technology for Developing Communities, has been established to co-ordinate and consolidate the CSIR's existing multi-divisional involvement with developing communities in South Africa and other countries in Sub-Saharan Africa.

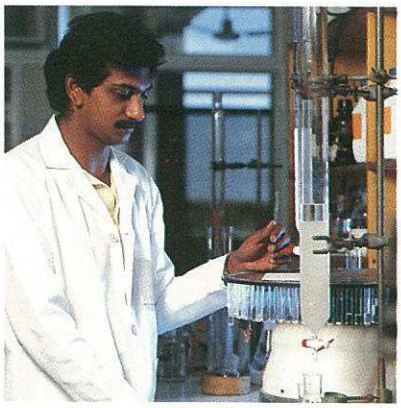
As part of the on-going process of driving up productivity, the Executive initiated an investigation into corporate overhead expenses and the overhead expenses in the support functions of strategic units to identify activities that we can eliminate without risk. This investigation also assisted us in achieving our stated objective of cutting corporately funded expenses to below 12 per cent of the total turnover (11,5 per cent in 1992/93). The overhead cost analysis will help to limit these expenses to 10 per cent of turnover during 1993/94.

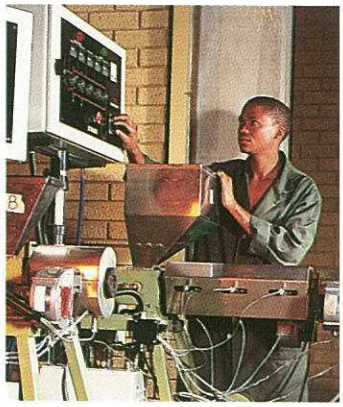
Also resulting from this investigation was the contracting out of a number of functions and services, including security services and the CSIR's printing facility. This will ensure considerable cost savings without compromising service quality. More importantly the cost savings free up resources for investment into the core of our business: research, development and implementation.

Internal business processes

The CSIR's new Management Information System went into operation in time for the commencement of the 1993/94 financial year on 1 April. Known as GENESYS, the system comprises a number of commercially available packages integrated with custom built applications and interfaces, notably our Project Management, Marketing and Human Resources Systems, to form a suite of applications tailor-made to the needs of our business.

The design philosophy for GENESYS was to empower the Project Leader, to ensure that he or she can plan, monitor and control the development of each project effectively with minimal effort, manage the customer interface professionally, and deploy resources productively. Of par-





ticular importance is the need, addressed by GENESYS, for staff in different business units to work on integrated, CSIR-wide projects, giving impetus to the CSIR's strategy of drawing resources from all parts of the organisation to provide comprehensive multi-disciplinary solutions to attend to the needs of our clients.

The implementation of GENESYS also moves the CSIR into the category of businesses for which information technology provides a vital empowering influence, enabling management to obtain on-line relevant information, packaged to support its business needs.

The CSIR's first client satisfaction audits were conducted in July 1991 to determine the overall levels of customer satisfaction received from the organisation. The initial benchmark audit was followed up on a six-monthly basis by monitoring audits of our customer base. A target of 94 per cent customer satisfaction was set to be achieved by 31 March 1993. This figure was in fact reached by the second monitoring audit in September 1992.

The CSIR was subjected to two performance audits by the Office of the Auditor-General. The two performance areas selected were cash management and project management.

In the instance of cash management, the limitation of authority placed by the Minister of Trade and Industry on the Board to invest and borrow money was identified as having had a significant influence on the management of cash resources. This limitation has recently been removed.

The performance audit on cash management has revealed that there was not sufficient emphasis on cash flow forecasting and monitoring and the use of trade creditor finance. The recommendations regarding cash flow forecasting systems will be implemented in tandem with new management information systems during 1993.

The project management performance audit indicated that the CSIR has effective project management processes in place. Shortcomings identified were in the formalisation of processes. This problem will be addressed within the framework of the International Organisation for Standardisation (ISO) 9000 Quality Standard which will be implemented on a pilot basis in Aerotek.

The CSIR Board has approved a process to update the corporate strategic plan by November 1993. The existing mission statement will not be affected but consideration will be given to ways of enhancing the CSIR's partnership role and extending it to small companies and developing communities.

Highlights

An overview of selected highlights and successes of the past year is provided in Technology Impact, the accompanying document to this Annual Report. Especially noteworthy among these are:

- A process developed by the CSIR and AECI to produce lysine at high yield and productivity led to an announcement by AECI of a R300 million fermentation plant to be commissioned in 1995 for the production of 11 000 tons of this amino acid per year.

- The unique intelligent ACL electro-optical intruder detection system for which patents are pending world-wide.

- A computerised Optical Rock Size Classifier developed and patented for use at gold mines.

- PREMIS, the computerised Professional Real Estate Management Information System, which has attracted a great deal of attention among the more progressive UK and USA estate managers.

- The Kangela on-line ash monitor for faster and more efficient coal processing.

- Community Relevant Appropriate Food Technology (CRAFT), a service which is specifically aimed at assisting developing communities.

- The development of stereolithography as a key technology in facilitating concurrent engineering.

- The Tensojet Tensile Tester, an instrument based on a patented new method developed by the CSIR for the high-speed tensile testing of yarns.

A significant amount of excitement was generated by the process which eventually led to the Government's decision to place an order with the Swiss Pilatus firm for replacement aircraft for its Harvard trainers in preference to the locally developed composite materials New Generation Trainer (NGT). We are in collaboration with potential partners, exploring avenues for the further development of composite materials technology and its local and international industrialisation and commercialisation.

During the year the CSIR received 122 769 visitors. Local visitors of note included the State President and five members of the Cabinet as well as senior officials from 24 companies, as part of the CSIR's "Expres" - exhibition/presentation - programme. On these occasions the CSIR's activities are outlined to VIP visitors by members of the Executive and other presenters.

In July 1992, the Compuserve service was launched. This service provides access to on-line information for personal users. The success of the Compuserve information service is clear from the growth in the number of subscribers from 323 to 786 users over the six months from September 1992 to February 1993.

Worldnet Gateway will be launched in May 1993 and is aimed at corporate users. Through Worldnet Gateway, users in South Africa will have on-line access to more than 1 000 databases throughout the world.

Human resources

The personnel complement of the CSIR declined from 3 427 in April 1992 to 3 077 at the end of March 1993. The factors contributing to this reduction were natural attrition, where retirements played quite a large role, and non-replacement of staff who resigned. Some redundancies also had an effect.

A process developed by the CSIR and AECI led to an announcement by AECI of a R300 million fermentation plant to be commissioned in 1995 for the production of 11 000 tons of lysine per year.

The merger between the Chamber of Mines Research Organisation (COMRO) and the CSIR in March 1993 did not affect the staff complement because COMRO's staff is seconded to the CSIR for the first two years, and, for the time being, remains in the Chamber's employ.

Personnel turnover for the year came to 13,1 per cent, of which controllable resignations contributed only 7 per cent. Stringent economic conditions continued to have a restraining effect on staff mobility and contributed to the stability of the CSIR's personnel.

Continuing steps have been taken to enhance the representation of the country's overall population mix in our staff complement at all levels of the organisation. Our efforts in the area of affirmative action have included the appointment of Black undergraduate and post-graduate bursars, skills improvement programmes for illiterate and semi-literate staff, the employment of Black graduates and returned exiles, and provision for Black graduate employees to gain post-graduate experience.

In terms of occupational safety, the CSIR attained a Four Star NOSA rating, an accomplishment achieved within only three years. The disabling accident frequency rating improved by 31 per cent compared to the previous year. This rating compares favourably with the best in industry.

The Mopanie Crèche, which is managed by a contractor as a private concern, was officially opened on 23 February 1993 on the Scientia site. It provides a very welcome service to the children of staff members and has been registered with the TED to ensure adherence to Provincial education standards.

Personalia

- Dr Piet Steyn was appointed the first CSIR Fellow. He also received the Havenga Medal from the S A Akademie vir Wetenskap en Kuns and has been awarded the Friedrich Schweizer Award by the International Association for Cereal Science and Technology for his exceptional contributions over many years in this field.

- Dr Ben Fouché, Director of the Division of Information Services, was elected to the Executive Management of the International Council for Scientific and Technical Information, an affiliated body of the International Council of Scientific Unions.

- Dr Brian Clark, President, has been awarded the Alexander von Humboldt Foundation medal for promoting international co-operation.

- Dr Mike Thackeray received the International Battery Association Research Award for the excellent contribution that he has made. The award was presented to him at the meeting of the International Battery Association during May 1993.

The CSIR again acknowledged its Outstanding Achievers, with awards going to Drs Harry Booyens, Johan Dekker, Dirk Grobler and Graham

Wright and Messrs Jeremy Cizek and Robert Speth.

Two new division directors joined the CSIR: Mr Anthos Yannakou as head of the Division of Food Science and Technology on 1 February 1993 and Dr Hoffman Maree, who joined the CSIR on 1 April 1993.

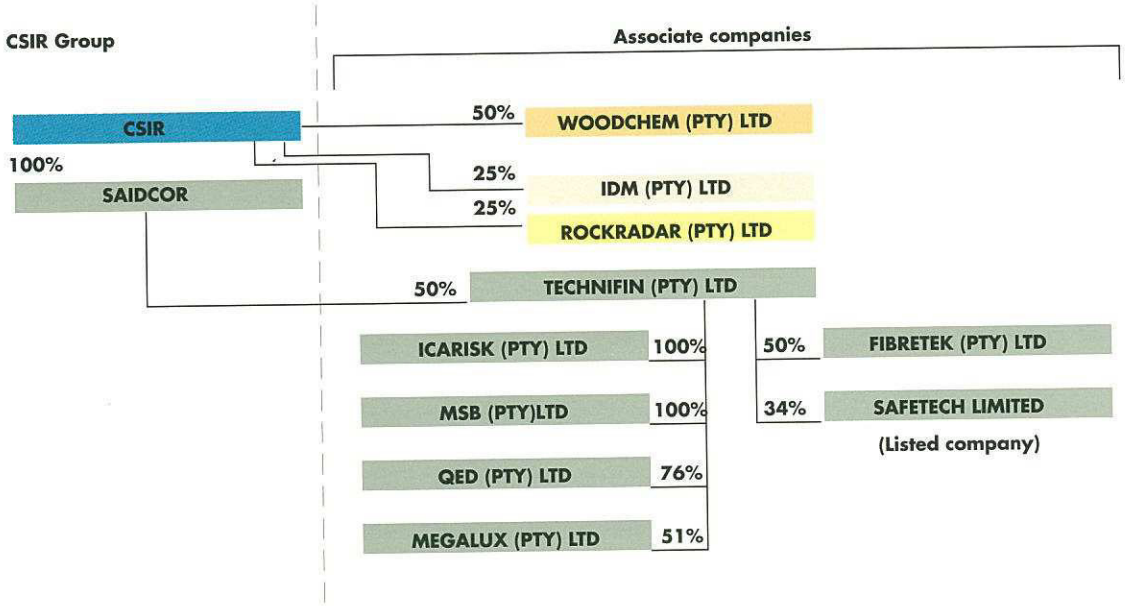
The CSIR took leave of one of its Executive Vice Presidents, Mr Albert Michau, who was responsible for Finance and Management Services. He left to join the executive team at the S A Post Office Limited. We thank him for his invaluable service to the organisation over more than four years and wish him success for the future.

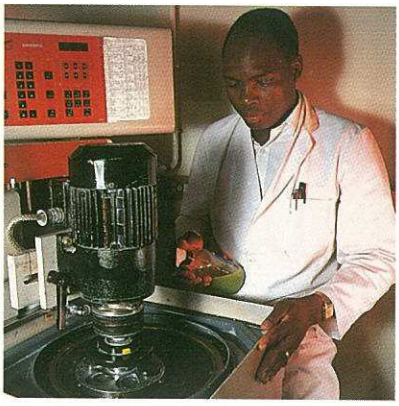
The road ahead

The past five years have seen tremendous changes both within South Africa and the CSIR. We stand on the threshold of a new era, far removed from the realities of the 70s and 80s.

It is evident that the CSIR is increasingly being accepted, locally and internationally, among people of all persuasions, as a critical source of expertise to be harnessed for the good of all South Africans and the countries in Sub-Saharan Africa.

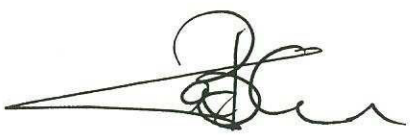
The changing attitudes towards the CSIR present us with major opportunities for the future. As we




strive to earn enhanced recognition, we must take stock and subject our own practices and activities to in-depth evaluation. We have committed the CSIR to conducting its affairs as a contract research organisation with business-like and professional management practices, whose immense capacity and resource base will be available to anyone within accepted client/contractor principles and, above all, as a contract research organisation whose operations and activities are ethical and can stand up to local and international scrutiny.

One feature which has continued to grow in importance is the need for client confidentiality. Client confidentiality surrounding the details of work done under contract will be protected at all costs. There is a growing understanding that the CSIR, functioning in accordance with rigorous client/contractor principles, is an organisation much like any other international Contract Research Organisation. As a technology provider, the CSIR enters into contracts across the spectrum of potential technology users - from big business to small, including micro enterprises in the informal sector; from government departments to emerging socio-political structures; from the defence community to members of urban and rural settlements. Management remains committed to meeting our clients' expectations as a premier technology provider.



J B CLARK
PRESIDENT

RESUMO DO RETROSPECTO DA DIRECÇÃO EXECUTIVA

A comunidade sul-africana continua a passar por um processo de transformação social e económica. A nossa progressão para uma nova ordem continuará a fazer procuras especiais e, às vezes, aparentemente em conflito em todos os níveis em todas as comunidades. Igualmente, isto aplicá-se-á à prática da ciência e da tecnologia.

No CSIR, reconhecemos a necessidade de fortalecer as ligações entre nós como fornecedores de tecnologia, e os sectores formais e informais da indústria, como os utentes da tecnologia. Esta ligação trata da industrialização e comercialização da tecnologia, em maneira eficaz, a qual é padrão fundamental do negócio do CSIR.

Uma avaliação das políticas científicas e tecnológicas na África do Sul foi realizado pelo IDRC (Centro canadiano da Investigação do Desenvolvimento internacional), sendo patronos, os ANC, COSATU e SANCO, durante a última parte de 1992 e no princípio de 1993. Mesmo quando medido em termos internacionais, temos feito um bom trabalho de cooperar com a indústria maior. Mas, conforme o relatório, precisamos de avançar no iniciativo do qual temos empreendido relativamente a trabalhar com as comunidades em desenvolvimento. Não há dúvida que estas funções do nosso negócio, tornará-se importante de modo crescente nos anos próximos.

Para o ano 1992-93, o CSIR estabeleceu-se alvos corporativos nos termos da administração de tecnologia, as vendas e finanças, o rendimento dos produtos a sair e a administração da qualidade estratégica.

O primeiro projecto de administração da tecnologia corporativa foi completado antes de Agosto de 1992.

Todas as secções completaram o ciclo de desenvolvimento para quatro produtos novos. Como um tudo, o CSIR lançou no mercado treze produtos e ganhou, antes de Agosto de 1992, o primeiro rendimento deste processo.

O Programa de Satisfacção da clientela, um componente da Administração da Qualidade estratégica, foi totalmente implementado, e o CSIR realizou uma satisfacção clientela de 94% antes de Março 1993.

O Administrator de Tarefas II foi implementado em todo o CSIR, e todo o pessoal envolvido nas actividades da administração dos projectos utilizavam plenamente este sistema antes de Março de 1993.

O CSIR encarregou-se duma análise em pormenor da sua ligação com a indústria fabricante durante 1992, sendo o foco sobre os sectores de fabricantes e mineiros, o qual levou a reestructuração de duas divisões do CSIR - as Divisões anteriores de Tecnologia de Sistemas aeronaúticos e de Tecnologia de Produção - as quais foram amalgamadas numa só Divisão de Tecnologia fabricante e de Sistemas aeronaúticos.

O GENESYS, O nosso Sistema informático de

Administração do CSIR, entrou em vigor no primeiro de Abril para o começo do ano financeiro de 1993-94. O sistema inclui um número de conjuntos comercialmente disponíveis, integrados com aplicações e interfaces construidas de encomenda, notavelmente os nossos sistemas de Administração de Projectos, Comercialização e Recursos humanos, para constituir um séquito de aplicações adaptadas às necessidades do nosso negócio.

Durante o ano, o CSIR recebeu 122 769 visitantes, dos quais muitos do estrangeiro. Os visitantes locais incluirem o Presidente do Estado e cinco membros do Cabinet.

Havia 29 visitas, como parte do programa "EXPRES" (exposição/apresentação) do CSIR.

Em Julho de 1992, Infotek lançou os serviços de "Compuserve" e "Worldnet" em Maio de 1993. Estes sistemas fornecem o acesso informático "em linha", enquanto o "Compuserve" visa aos utentes pessoais, e o "Wordnet Gateway" aos utentes corporativos. Por intermédio do "Worldnet Gateway" os utentes na África do Sul têm entrada "em linha" a mais de 1 000 bases informáticas em todo o mundo.

A totalidade do pessoal do CSIR diminuiu de 3 427 em Abril de 1992 até 3 077 nos fins de Março de 1993.

Tomaram-se continuamente os passos para realçar a representação do misto global da população do país na totalidade do nosso pessoal a todos os níveis da organização.

Nos últimos cinco anos observavam-se mudanças tremendas não só dentro da África do Sul mas também no CSIR. Estamos no limiar duma nova era, muito diferente das realidades dos anos 70 e 80.

Nos últimos dois anos, trabalhámos duramente, e com éxito, em mudar as vistas e as percepções relativas ao CSIR, entre os executantes principais nas agências internacionais.

É evidente que o CSIR está a ser aceite de modo crescente, localmente e internacionalmente, entre as pessoas de todas as convicções, como uma fonte crítica de vistoria pericial, a ser aproveitado para o bom de todos os Sul-africanos e dos países na África sub-sahariana.

RÉSUMÉ DE DIRECTION

La société sud-africaine connaît actuellement un processus de transformation sur le plan social aussi bien que sur le plan économique. Notre progrès vers un ordre nouveau continuera de faire des demandes hors du commun et parfois apparemment incompatibles, à tous les niveaux et dans toutes les communautés. Elles se retrouvent également dans les domaines de la science et de la technologie.

Nous sommes conscients du fait qu'il faut renforcer les liens entre le CSIR, le pourvoyeur de la technologie, et les usagers de la technologie, c'est-à-dire les secteurs formels et informels de l'industrie. Ces liens touchent aux fonctions-clefs du CSIR qui sont l'industrialisation et la commercialisation rentables de la technologie.

Une évaluation des politiques sud-africaines actuelles en matière de science et de technologie a été entreprise par le Canadian International Development Research Centre (IDRC), sous l'égide de l'ANC, de COSATU et de SANCO, au cours de la dernière partie de 1992 et au début de 1993. Nous avons particulièrement bien réussi à collaborer avec les grandes industries, en comparaison d'autres organisations de recherche internationales. Cependant, selon le rapport, le CSIR doit développer les initiatives déjà amorcées en ce qui concerne les petites et moyennes entreprises et les communautés en voie de développement. Il n'y a aucun doute que ces aspects de notre fonction prendront de plus en plus d'envergure dans les années à venir.

Pour l'exercice 1992/93, le CSIR s'est donné certains objectifs dans les domaines de la gestion de la technologie, de la vente et du financement, des revenus provenant des produits transférés à l'industrie, ainsi que de la gestion stratégique de la qualité.

Le premier plan de gestion de la technologie a été terminé au mois d'août 1992.

Toutes les divisions ont complété le cycle de développement du Système de Gestion des Produits pour quatre produits nouveaux. En tout, le CSIR a lancé treize nouveaux produits sur le marché dont les premiers revenus sont rentrés au mois d'août 1992.

Le programme de formation "Satisfaction du Client" qui fait partie de la Gestion Stratégique de Qualité a été pleinement exécuté et au mois de mars 1993 la cote de Satisfaction du Client s'élevait à 94 pour cent.

L'emploi systématique du logiciel "Task Manager II" (pour la gestion des projets) a été étendu à tout le personnel du CSIR engagé dans la gestion de projets, dès le mois de mars 1993.

Au cours de l'année 1992, le CSIR a entrepris une analyse détaillée de ses liens avec l'industrie de fabrication, et surtout du secteur de la fabrication et du secteur minier, ce qui a abouti à la restructuration de deux de ses divisions - celles de la Technologie des systèmes aéronautiques et de la Technologie de la production - qui ont été réunies pour former la Division de la Technologie de la Fabrication et des Systèmes Aéronautiques.

Le fusionnement de la "Chamber of Mines Research Organisation (COMRO)" (service de recherche de la Chambre des Mines) avec le CSIR a créé une nouvelle force dans le domaine de la recherche et du développement miniers en Afrique australe, capable de fournir aux organismes miniers et connexes une gamme de technologies plus étendue.

Le nouveau Système d'Information pour la Gestion, GENESYS, est entré en opération à temps pour l'exercice financier de 1993/94 commençant le 1 avril. Ce système comprend un nombre de progiciels disponibles dans le commerce qui ont été intégrés avec des applications et des interfaces faites sur demande, en particulier nos systèmes de Gestion de Projets, de Commercialisation et de Ressources Humaines, pour obtenir une suite d'applications adaptée aux exigences de notre fonction.

Au cours de l'année, le CSIR a accueilli 122 769 visiteurs, dont un grand nombre venu de l'étranger. Le Président de la République et cinq membres du Cabinet figuraient parmi les visiteurs sud-africains.

Vingt-neuf visites ont eu lieu dans le cadre du programme d'exposition et de présentation "EXPRES" du CSIR.

En juillet 1992 la division Infotek a lancé les services Compuserve (visant les utilisateurs individuels) et Worldnet (visant les entreprises). Ces deux systèmes donnent accès à des informations en direct, Worldnet Gateway fournissant en particulier aux utilisateurs sud-africains un accès direct à plus de 1 000 bases de données partout dans le monde.

L'effectif du CSIR a baissé de 3 427 en avril 1992 à 3 077 à la fin du mois de mars 1993.

Des efforts continuent sans relâche pour atteindre une distribution plus équitable des différents secteurs de la population dans nos effectifs à tous les niveaux.

Les cinq dernières années ont vu d'énormes changements en Afrique du Sud aussi bien qu'au CSIR. Nous sommes sur le seuil d'une nouvelle époque, bien loin des réalités des années '70 et '80.

Grâce à un travail assidu au cours des deux dernières années nous avons réussi à changer les opinions et les perceptions vis-à-vis du CSIR regnant auprès de responsables-clefs de certaines agences internationales.

On peut constater que le CSIR est de plus en plus accepté, au niveau international aussi bien qu'à l'intérieur du pays, parmi des gens de persuasions diverses, comme source essentielle d'expertise, à harnacher pour le bien de tous les sud-africains et de tous les pays d'Afrique sub-Saharienne.

Zusammenfassender Rückblick der leitenden Geschäftsführung (Executive Management)

Die südafrikanische Gesellschaft befindet sich weiterhin in einem Prozess sozialer und wirtschaftlicher Umwandlung. Die Entwicklung hin zu einer neuen Ordnung wird auch in Zukunft fortgesetzt werden, um den besonderen und teilweise auch widersprüchlichen Anforderungen in allen Gesellschaftsgruppierungen und -schichten Rechnung zu tragen. Dieser Vorgang wird ebenfalls starke Auswirkungen auf die Ausübung von Wissenschaft und Technologie in unserem Lande haben.

Wir vom CSIR als Technologieanbieter sehen verstärkt die Notwendigkeit, unsere Beziehungen zu den formellen und informellen Sektoren der Industrie als den Technologieanwendern auszubauen. Hierbei denken wir hauptsächlich an kosteneffiziente Industrialisierung und an die Kommerzialisierung von Technologie, dem Grundstein des CSIR-Geschäfts.

Eine Beurteilung der wissenschafts- und technologiepolitischen Situation in Südafrika wurde Ende 1992 und Anfang 1993 vom "Canadian International Development Research Centre (IDRC)" durchgeführt, mit dem ANC, COSATU und SANCO als Schirmherren. Demnach hat der CSIR sehr gute Arbeit geleistet, was die Kooperation mit der Grossindustrie betrifft. Dies gilt auch im Vergleich zu internationalen Maßstäben. Dem Bericht zufolge müssen wir jedoch mit der Initiative fortschreiten, stärker mit den kleinen und mittelständischen Unternehmen zusammenzuarbeiten und verstärkt Entwicklungen in der regionalen Infrastruktur zu fördern. Es besteht kein Zweifel daran, dass diese Aktivitäten beim CSIR in den kommenden Jahren zunehmend an Bedeutung gewinnen werden.

Für das Haushaltsjahr 1992/93 setzte sich der CSIR einheitliche Ziele in Sachen Technologiemanagement, Verkauf und Finanzen, Einkommen aus Entwicklungen und Dienstleistungen für den freien Markt sowie strategischem Qualitätsmanagement.

Der erste divisionsübergreifende Technologiemanagement-Plan wurde im August 1992 fertiggestellt.

Alle Divisionen (Forschungsbereiche) des CSIR schlossen erfolgreich den Produktentwicklungsplan für vier Neuentwicklungen ab. Insgesamt brachte der CSIR 13 Produkte auf den Markt und verdiente sein erstes Einkommen aus diesem Prozess im August 1992.

Im Rahmen des strategischen Qualitätsmanagements wurde das Programm "Kundenzufriedenstellung" eingeführt. Bis einschliesslich März 1993 erzielte der CSIR bei seinen Klienten eine "Zufriedenheitsquote" von 94%.

Es wurde weiterhin ein Projektmanagement-System eingeführt. Seit März 1993 wird dieses System von allen Mitarbeitern beim CSIR, die in Projektmanagementaufgaben involviert sind, benutzt.

Im Verlauf des vergangenen Jahres führte der CSIR eine detaillierte Analyse seiner Beziehungen zur herstellenden Industrie Südafrikas in den Schwerpunkten Fertigungstechnik und Bergbau durch. Aufgrund dieser Auswertung wurden zunächst zwei CSIR-Divisionen umstrukturiert. Und zwar wurden die früheren Divisionen für Luftfahrtsystemtechnik und Produktionstechnik zu einer einzigen Division für Fertigungs- und Luftfahrtsystemtechnik zusammengeschlossen.

Darüber hinaus wurde die "Chamber of Mines Research Organisation (COMRO)" mit dem CSIR zusammengeführt, was zur Gründung eines neuen - des dreizehnten - Forschungsbereichs des CSIR führte, nämlich der Division für Bergbautechnik. Ziel dieser Fusion war es, eine neue Kraft auf dem Gebiet der bergbaubezogenen Forschung und Entwicklung im südlichen Afrika zu bilden und - damit verbunden - den einheimischen Bergbau- und bergbauverwandten Organisationen ein umfangreicheres Technologieangebot offerieren zu können.

Das neue Management-Informationssystem des CSIR, GENESYS, trat rechtzeitig zu Beginn des Finanzjahres 1993/94 am 1. April 1993 in Kraft. Dieses System umfaßt eine Anzahl von kommerziell zur Verfügung stehenden Software-Paketen, verknüpft mit zusätzlichen, speziell angefertigten Programmen und Schnittstellen, die auf unsere spezifischen geschäftlichen Bedürfnisse zugeschnitten sind, z.B. unsere Projektmanagement-, Marketing- und Personalmanagementsysteme.

Während des Geschäftsjahres 1992/93 empfing der CSIR insgesamt 122,769 Besucher, viele davon aus dem Ausland. Zu den prominentesten einheimischen Besuchern zählten unser Staatspräsident und fünf Mitglieder des Kabinetts.

29 Besuche erfolgten im Zusammenhang mit dem Ausstellungs- und Präsentationssprogramm EXPRES des CSIR.

Im Juli 1992 wurde der Compuserve-Service eingeführt, mit welchem für Einzelkunden ein on-line-Zugriff zu elektronischer Datenbank-Information ermöglicht wurde. Worldnet Gateway, eingeführt im Mai 1993, ermöglicht den gleichen Zugriff für Grosskunden. Mittels Worldnet Gateway haben südafrikanische Kunden on-line-Zugang zu mehr als 1000 Datenbanken in der ganzen Welt.

Die gesamte Belegschaft des CSIR reduzierte sich von 3,427 Mitarbeitern im April 1992 auf 3,077 Mitarbeiter Ende März 1993.

Es wurden weitere personalpolitische Schritte unternommen, die dazu beitragen sollten, bei der Besetzung von Stellen - auf allen Ebenen unserer Organisation - der gemischten Bevölkerungsstruktur des Landes stärker Rechnung zu tragen.

Die vergangenen fünf Jahre haben sowohl in Südafrika als auch beim CSIR gewaltige Veränderungen mit sich gebracht. Wir stehen gegenwärtig an der Schwelle zu einer neuen Ära, weit entfernt von den Bedingungen und Gegebenheiten der siebziger und achtziger Jahre.

In den letzten zwei Jahren haben wir schwer - und mit Erfolg - daran gearbeitet, die Ansichten und Auffasssungen über den CSIR unter den Schlüsselpersonen internationaler Verbände und Behörden ins richtige Licht zu rücken.

Es hat sich gezeigt, dass der CSIR sowohl hierzulande als auch auf internationaler Ebene zunehmend Anerkennung findet - unter Menschen und Organisationen mit den verschiedensten Ansichten - als eine wichtige Bezugsquelle von Wissen und Know-how, die zum Nutzen aller Südafrikaner und der anderen Länder im südlichen Afrika dienen kann.

The Annual Financial Statements of the CSIR have been audited in the manner required by section 5 of the Auditor-General Act, No 52 of 1989, and the CSIR 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 1993 and the results of its operations for the year then ended.

The executive has pleasure in presenting this report on the activities of the CSIR and the group for the year ended 31 March 1993.

Turnover

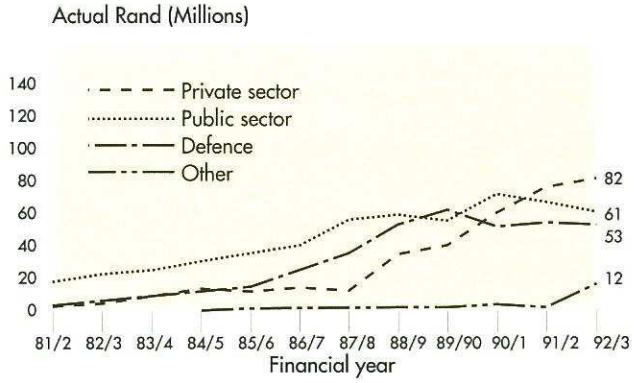
Due to a reduction in the Parliamentary grant, turnover reflects only a small year on year increase. The growth in contract income is a disappointing 6,1 per cent, mainly as a result of the funding cutbacks in the Public and Defence sectors. Growth of 8,9 per cent was achieved in Private sector contracts. In a rapidly changing market the CSIR and the group succeeded in maintaining the growth trend in contract income in the categories below:

	GROUP				CSIR			
	1993		1992		**1993**		1992	
	R'000	**%**	R'000	%	**R'000**	**%**	R'000	%
Parliamentary grant	**205 430**	**49**	210 008	51	**205 430**	**50**	210 008	52
Contract income	**208 759**	**50**	196 809	48	**208 759**	**50**	196 809	48
Private sector	**82 369**	**20**	75 615	18	**82 369**	**20**	75 615	19
Public sector	**61 329**	**15**	67 097	16	**61 329**	**15**	67 097	16
Defence sector	**52 653**	**12**	52 101	13	**52 653**	**12**	52 101	13
Other sectors (including Africa)	**12 408**	**3**	1 996	1	**12 408**	**3**	1 996	–
Royalties	**4 736**	**1**	4 537	1	**511**	**–**	637	–
Total turnover	**418 925**	**100**	411 354	100	**414 700**	**100**	407 454	100

The graphs presented in the annual financial statements refer to CSIR results and not those of the group.

During the course of the last decade there have been significant changes in the composition of external contract income which are highlighted in Figure 1.

Significant progress has been made in raising the turnover per employee as shown in Figure 2.



Financial results

A number of non-recurring items, as approved by the Board, had a negative effect on the results for the year under review. A change in the estimated remaining useful lives of certain assets resulted in additional depreciation being charged against income. Certain extraordinary provisions were also charged against income during the year while the inclusion of the COMRO results for the three months to 31 March 1993 had a further negative impact on the results.

From the following comparison the impact of the above-mentioned items on the results for the year under review shows very clearly:

	GROUP		CSIR	
	1993 R'000	1992 R'000	1993 R'000	1992 R'000
Net surplus for the year before the above adjustments	**30 111**	34 896	**28 491**	29 302
Additional charges against income	**26 315**	–	**26 315**	–
Additional depreciation	**8 215**	–	**8 215**	–
Redundancy provision	**11 100**	–	**11 100**	–
Provision for self-insurance	**7 000**	–	**7 000**	–
Deficit attributable to the activities of COMRO	**1 192**	–	**1 192**	–
	2 604	34 896	**984**	29 302

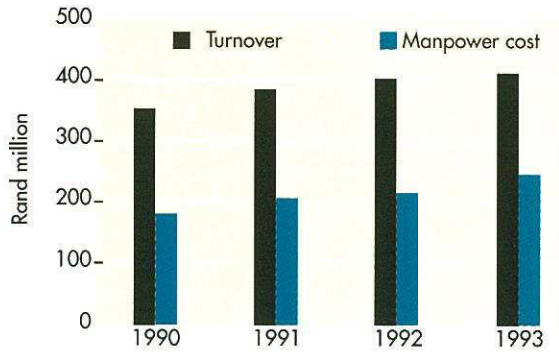
This surplus was achieved notwithstanding the R4,6 million reduction in the Parliamentary grant and a R4,7 million reduction in income from investments, mainly due to lower interest rates.

Value created

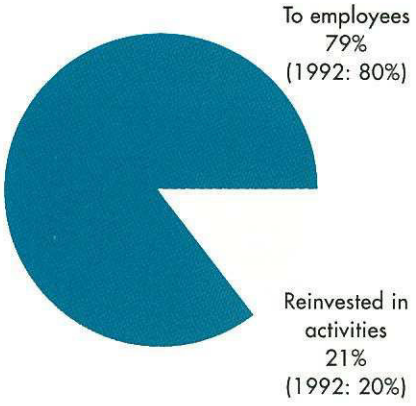
Value added is the result of applying labour, goods and services in the research, development and implementation of technology. Value created is the excess of revenue received for research, development and implementation of technology over the costs thereof. The value added statement shows the sources of value created and how this value is distributed, both to meet necessary reinvestment in assets and operations and to remunerate those responsible for the CSIR's achievements.

	GROUP				CSIR			
	1993 R'000	**%**	1992 R'000	%	**1993 R'000**	**%**	1992 R'000	%
Turnover	**418 925**		411 354		**414 700**		407 454	
Paid to suppliers for goods and services	**161 250**		155 857		**161 246**		155 853	
Value added	**257 675**	**88**	255 497	86	**253 454**	**88**	251 601	88
Investment income	**28 544**	**10**	30 664	10	**27 429**	**10**	32 148	11
Other income	**5 877**	**2**	10 662	4	**5 873**	**2**	3 760	1
Total value created	**292 096**	**100**	296 823	100	**286 756**	**100**	287 509	100
Value released from (transferred to) accumulated funds	**29 091**	**10**	(6 939)	(2)	**30 711**	**11**	(1 345)	–
Transfer to accumulated funds	**(2 604)**	**1**	(34 896)	12	**(984)**	**–**	(29 302)	10
Capital expenditure	**31 695**	**11**	27 957	10	**31 695**	**11**	27 957	10
Total created and released	**321 187**	**110**	289 884	98	**317 467**	**111**	286 164	100
Distributed as follows:								
Employees	**252 835**	**87**	229 926	78	**252 835**	**88**	229 926	80
Salaries, wages and other manpower costs	**235 602**	**81**	229 926	78	**235 602**	**82**	229 926	80
Provision for redundancy payments	**11 100**	**4**	–	–	**11 100**	**4**	–	–
Paid to COMRO employees	**6 133**	**2**	–	–	**6 133**	**2**	–	–
Reinvestment in fixed assets and operations	**68 352**	**23**	59 958	20	**64 632**	**23**	56 238	20
Depreciation	**37 498**	**13**	32 703	11	**33 778**	**12**	28 983	10
Net acquisition of fixed assets	**30 854**	**10**	27 255	9	**30 854**	**11**	27 255	10
– Fixed assets acquired	**31 695**	**10**	27 957	9	**31 695**	**11**	27 957	10
– Proceeds on disposal of fixed assets	**841**	**–**	702	–	**841**	**–**	702	–
Total value distributed	**321 187**	**110**	289 884	98	**317 467**	**111**	**286 164**	100

TURNOVER TO MANPOWER COST



DISTRIBUTION OF VALUE



Fixed assets

Strategic assets of limited commercial application are written down to their commercially recoverable value at acquisition. The medium-speed wind tunnel and the satellite application centre were written down in line with the new accounting policy resulting in a prior year adjustment to the opening balance of accumulated funds of R108,4 million. A change in the estimate of the useful lives of certain fixed assets resulted in an amount of R8,2 million additional depreciation being charged against income in the year under review.

Trade agreement

The CSIR negotiated an agreement with the Chamber of Mines to merge the activities of its Research Organisation (COMRO) with its own. The agreement was signed on 15 March 1993 and is effective from 1 January 1993. A multi-disciplinary mining research and development division of mining technology – Miningtek – was created by merging the specialist skills of COMRO with relevant mining research and development resources within the CSIR.

- Results for the three months to 31 March 1993

  The results of the activities of COMRO for the three months since its previous year end at 31 December 1992, are included in the results of the CSIR and the group. The effect of these inclusions are separately disclosed in note 2 to the annual financial statements.

- Contracts in progress

  The Chamber of Mines ceded all its contracts in progress at 31 March 1993 to the CSIR. A valuation of these contracts in progress as at 31 March 1993 in accordance with the CSIR accounting policy amounts to R0,6 million.

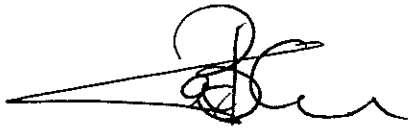
- Fixed assets

  The CSIR will lease from the Chamber of Mines the immovable property from which COMRO conducts its business for one rand per annum and will lease the plant, equipment and vehicles for one rand per annum. The agreement will run for five years after which period selected assets will be transferred to the CSIR. The leased assets will not be capitalised as the trial arrangement may be terminated at any date within the five year period, in which case ownership will remain with the Chamber of Mines.

- CSIR funding of the agreement

  An amount of R5 million was accrued at 31 March 1993 and subsequently paid to the Chamber of Mines. This amount is refundable to the CSIR together with interest calculated at the prime bank overdraft rate in the event of termination of the agreement before the expiry date of 15 March 1998.

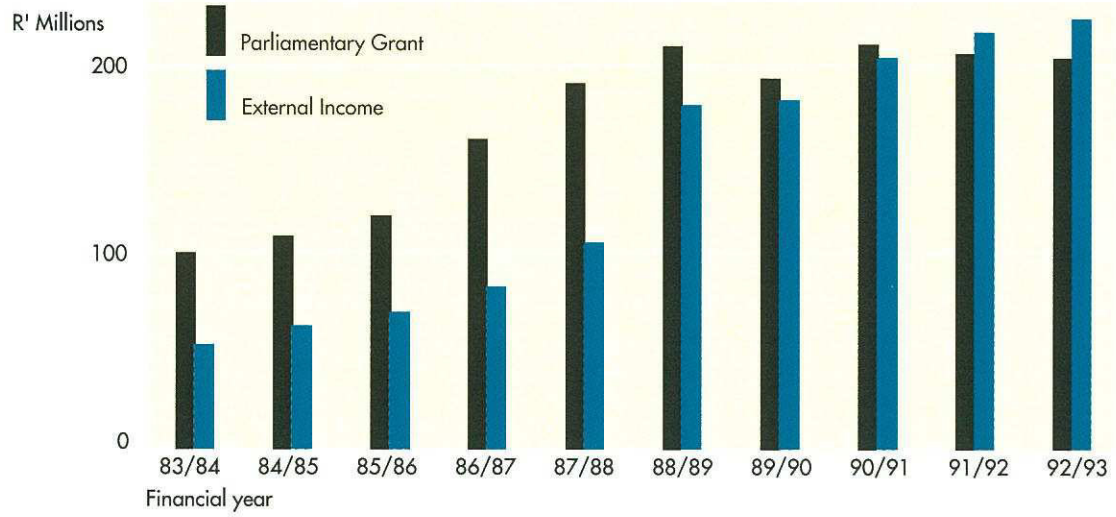
R F Camphor
Executive Vice President



J B Clark
President

	Notes	GROUP 1993 R'000	GROUP 1992 R'000	CSIR 1993 R'000	CSIR 1992 R'000
Turnover	2	**418 925**	411 354	**414 700**	407 454
Parliamentary grant		**205 430**	210 008	**205 430**	210 008
Contract income		**208 759**	196 809	**208 759**	196 809
Royalties		**4 736**	4 537	**511**	637
Other income		**5 877**	10 662	**5 873**	3 760
Proceeds on disposal of fixed assets		**841**	702	**841**	702
Total operating income		**425 643**	422 718	**421 414**	411 916
Expenditure					
Remuneration		**252 835**	229 926	**252 835**	229 926
Depreciation		**37 498**	32 703	**33 778**	28 983
Operating expenses		**161 250**	155 857	**161 246**	155 853
Total expenditure		**451 583**	418 486	**447 859**	414 762
Net operating deficit (surplus) for the year before interest	2	**25 940**	(4 232)	**26 445**	2 846
Income from investments	3	**28 544**	30 664	**27 429**	32 148
Net surplus for the year	4	**2 604**	34 896	**984**	29 302
Prior year adjustment	4	**–**	(111 369)	**–**	(108 570)
Accumulated funds at the beginning of the year		**400 882**	477 355	**384 613**	463 881
Accumulated funds at the end of the year		**403 486**	400 882	**385 597**	384 613

TOTAL INCOME



	Notes	GROUP 1993 R'000	GROUP 1992 R'000	CSIR 1993 R'000	CSIR 1992 R'000
Capital employed					
Accumulated funds		**403 486**	400 882	**385 597**	384 613
Long-term loan	5	–	4 225	–	–
Total capital employed		**403 486**	405 107	**385 597**	384 613
Employment of capital					
Fixed assets	4 & 6	**189 981**	197 554	**189 981**	193 834
Investments	7	**7 201**	2 731	**5 103**	103
Interest in subsidiary	8	–	–	**27 220**	27 220
Net current assets		**206 304**	204 822	**163 293**	163 456
Current assets		**323 679**	299 455	**279 573**	256 767
Debtors and prepayments	9	**50 762**	40 357	**50 762**	40 357
Stock and contracts in progress	10	**29 600**	26 264	**29 600**	26 264
Cash and short-term deposits		**243 317**	232 834	**199 211**	190 146
Current liabilities		**117 375**	94 633	**116 280**	93 311
Advances received	11	**33 412**	29 880	**32 384**	28 562
Creditors and provisions	12	**83 963**	64 753	**83 896**	64 749
Total employment of capital		**403 486**	405 107	**385 597**	384 613

	Notes	GROUP 1993 R'000	GROUP 1992 R'000	CSIR 1993 R'000	CSIR 1992 R'000
Cash generated from operating activities		**22 018**	28 155	**17 490**	22 186
Cash generated by operations	A	**13 017**	40 336	**8 262**	27 123
Cash generated (utilised) by a decrease (increase) in working capital	B	**9 001**	(12 181)	**9 228**	(4 937)
Cash (utilised) generated from investment activities		**(2 310)**	3 409	**(3 425)**	4 893
Income from investments		**28 544**	30 664	**27 429**	32 148
Fixed assets acquired	C	**(31 695)**	(27 957)	**(31 695)**	(27 957)
Proceeds on disposal of fixed assets	D	**841**	702	**841**	702
Cash generated		**19 708**	31 564	**14 065**	27 079
Long-term loan repaid		**4 225**	3 900	**–**	–
Increase in loans to associate companies		**–**	2 609	**–**	–
Acquisition of investment		**–**	72	**–**	72
Acquisition of trade agreement		**5 000**	–	**5 000**	–
Increase in cash and short-term deposits		**10 483**	24 983	**9 065**	27 007
Cash utilised		**19 708**	31 564	**14 065**	27 079

	GROUP		CSIR	
	1993 R'000	1992 R'000	**1993 R'000**	1992 R'000
A. Cash generated by operations				
Net operating (deficit) surplus before interest	**(25 940)**	4 232	**(26 445)**	(2846)
Adjusted for: Depreciation	**37 498**	32 703	**33 778**	28 983
Loss on disposal of fixed assets	**929**	986	**929**	986
Share of associate companies losses	**530**	2 415	**–**	–
	13 017	40 336	**8 262**	27 123
B. Cash generated (utilised) by a decrease (increase) in working capital				
Debtors and advances	**(10 405)**	6 072	**(10 405)**	6 072
Stock and contracts in progress	**(3 336)**	(3 436)	**(3 336)**	(3 436)
Advances received	**3 532**	(18 092)	**3 822**	(10 848)
Creditors and provisions	**19 210**	3 275	**19 147**	3 275
	9001	(12 181)	**9 228**	(4 937)
C. Fixed assets acquired				
Land and buildings	**1 147**	7430	**1 147**	7 430
Development expenditure and intellectual property	**5 153**	–	**5 153**	–
Equipment	**25 232**	20 487	**25 232**	20 487
Vehicles	**163**	40	**163**	40
	31 695	27 957	**31 695**	27 957
D. Proceeds on disposal of fixed assets				
Book value of assets disposed of	**1 770**	1 688	1 770	1 688
Cost	**10 385**	10 713	**10 385**	10 713
Accumulated depreciation	**8 615**	9 025	**8 615**	9 025
Loss on disposal	**929**	986	**929**	986
	841	702	**841**	702

1. Principal accounting policies

The annual financial statements are prepared on the historical cost basis and in accordance with generally accepted accounting practice. Except as indicated in notes 1.5, 1.6 and 4 the accounting policies have been consistently applied in all material aspects.

1.1 Basis of consolidation

The consolidated financial statements include the financial statements of the CSIR and its subsidiary. The operating results of the subsidiary are included from the effective date of acquisition.

1.2 Associate companies

Associate companies are those companies in which the group has a significant influence and which it intends to hold as long-term investments. Associates are accounted for by the equity method from their most recently audited financial statements or unaudited management information as at 31 March 1993, where this is considered necessary.

1.3 Research and development

Research costs are charged against income as and when incurred. Development costs of clearly defined products, of which the future technical feasibility and commercial viability has been proven to the satisfaction of the Board, are capitalised. The extent of capitalisation is limited to an amount equal to the probable related future revenues.

1.4 Foreign currencies

Assets and liabilities in foreign currencies are converted to South African rand at the rate of exchange ruling at the balance sheet date or rates stipulated in forward exchange contracts. 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 secured. Forward exchange contracts are secured for all material foreign liabilities.

1.5 Fixed assets and depreciation

1.5.1 Land and buildings

Land and buildings are stated at cost. Buildings are regarded as investment properties and are not depreciated. Provision for refurbishment is charged against income.

1.5.2 Plant, equipment and vehicles

Plant, equipment and vehicles are stated at cost less accumulated depreciation. Strategic assets with limited commercial application are written down to their estimated future commercial value at acquisition.

1.5.3 Development expenditure and intellectual property

Development expenditure and intellectual property consist of capitalised development costs as approved by the Board. Capitalisation is limited

to the expected discounted net future income.

1.5.4 Depreciation

Depreciation is based on cost and calculated on the straight line method at rates considered appropriate to write off book values over the estimated useful lives of the assets except for:

- Assets costing R2 000 or less, which are depreciated in the year purchased.
- Assets specifically acquired for a contract, which are depreciated over the life of the contract.
- Strategic assets of limited commercial application, which are written down to expected future commercial recoverable values in the year of acquisition, with the remaining book values depreciated over the estimated useful lives of the assets.
- Development expenditure and intellectual property, which are depreciated over a maximum of three years.

The estimated lives of the main categories of fixed assets are as follows:

Plant	10 years
Equipment	5–10 years
Vehicles	10 years
Computer equipment	3 years
Development expenditure and intellectual property	3 years

1.6 Investments

Investments are stated at cost less amounts written off. Investments are written down where, in the opinion of the Board, a permanent diminution in value has occurred.

1.7 Turnover

Turnover comprises:

- The net invoiced value of research, development and implementation contracts excluding value added tax.
- Contract income as calculated per note 1.8.
- The annual Parliamentary grant.
- Royalties.

1.8 Stock and contracts in progress

Raw materials and finished goods are stated at the lower of cost and net realisable value. Cost is determined on the average method. Contracts in progress are stated at the lower of cost and net realisable value. Net realisable value is calculated as a percentage of the sales value of work completed, after provision for losses relating to the stage of completion and any foreseeable losses to completion of the contract.

	GROUP		CSIR	
	1993 R'000	1992 R'000	1993 R'000	1992 R'000
2. Net operating deficit (surplus) for the year before interest				
The net operating deficit (surplus) for the year before interest is arrived at after taking the following items into account:				
Deficit attributable to the activities of COMRO for the three months ended 31 March 1993	**1 192**	**–**	**1 192**	**–**
Income included in turnover	**8 470**	–	**8 470**	–
Remuneration	**6 133**	–	**6 133**	–
Operating expenses	**3 529**	–	**3 529**	–
Auditors' remuneration	**964**	948	**960**	944
Audit fees	**918**	760	**914**	756
Expenses	**46**	44	**46**	44
Underprovision for previous year	**–**	144	**–**	144
Depreciation – note 4	**37 498**	32 703	**33 778**	28 983
After change in accounting policy	**29 283**	32 703	**25 563**	28 983
Before change in accounting policy	**34 830**	39 350	**31 110**	35 630
Change in accounting policy	**(5 547)**	(6 647)	**(5 547)**	(6 647)
Change in estimate	**8 215**	–	**8 215**	–
Net loss on disposal of fixed assets	**929**	986	**929**	986
Movement in provisions	**12 815**	10 856	**12 815**	10 856
Provision for self-insurance	**7 000**	–	**7 000**	–
Provision for accumulated leave	**(5 285)**	10 856	**(5 285)**	10 856
Provision for redundancy payments	**11 100**	–	**11 100**	–
Interest paid	**6**	396	**6**	396
Fees paid for services	**25 462**	26 854	**25 462**	26 854
Patent costs	**863**	1 399	**863**	1399
Legal costs	**888**	215	**888**	215
Sub contracted research services	**23 711**	25 240	**23 711**	25 240
Board members' emoluments				
For services on the Board	**138**	128	**138**	128
3. Income from investments				
Interest earned	**29 089**	33 092	**22 944**	25 633
Dividends from subsidiary	**–**	–	**4 500**	6 528
Share of associate companies losses	**(530)**	(2 415)	**–**	–
Loans to associate companies written off	**(15)**	(13)	**(15)**	(13)
	28 544	30 664	**27 429**	32 148

4. Prior year adjustment

Changes in accounting policies

During the year the CSIR and the group changed their accounting policies in the following respects:

– Strategic assets

Strategic assets with limited commercial application are written down to their estimated future commercial values at acquisition. Previously, such assets were depreciated on the straight-line method at rates considered appropriate to write off the assets over their estimated useful lives.

– Investments

The carrying value of long-term investments are adjusted for permanent diminution in value as and when this occurs. All investments were previously stated at cost.

	GROUP		CSIR	
	1993 R'000	1992 R'000	**1993 R'000**	1992 R'000
Adjustment to the opening balance of accumulated funds arising from the changes in accounting policies:	–	111 369	–	108 570
Depreciation of strategic assets	–	108 432	–	108 432
Carrying value of investments	–	2 937	–	138
Net surplus (deficit) for the year				
Before the changes	**(2 398)**	30 677	**(4 548)**	22 668
Depreciation - note 2	**5 547**	6 647	**5 547**	6 647
Before change in accounting policy	**6 188**	7 288	**6 188**	7 288
After change in accounting policy	**641**	641	**641**	641
Reducing the carrying value of investments	**(545)**	(2 428)	**(15)**	(13)
After the changes	**2 604**	34 896	**984**	29 302

5. Long-term loan

The interest-free loan was repaid during the year	–	4 225	–	–

6. Fixed assets

Group	Depreciation for the year R'000	1993 Cost R'000	1993 Accumulated Depreciation R'000	1993 Net book value R'000	1992 Cost R'000	1992 Accumulated Depreciation R'000	1992 Net book value R'000
Land and buildings	–	106 851	–	106 851	105 716	–	105 716
Development expenditure and intellectual property	4 425	23 751	19 303	4 448	18 598	14 878	3 720
Equipment	32 901	350 391	272 079	78 312	335 261	247 562	87 699
Vehicles	172	2 202	1 832	370	2 310	1 891	419
	37 498	483 195	293 214	189 981	461 885	264 331	197 554

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Land and buildings	–	106 851	–	106 851	105 716	–	105 716
Development expenditure and intellectual property	705	5 153	705	4 448	–	–	–
Equipment	32 901	350 391	272 079	78 312	335 261	247 562	87 699
Vehicles	172	2 202	1 832	370	2 310	1 891	419
	33 778	464 597	274 616	189 981	443 287	249 453	193 834

Land and buildings are unencumbered and full details of the titles are available at the registered offices of the CSIR.

	GROUP 1993 R'000	GROUP 1992 R'000	CSIR 1993 R'000	CSIR 1992 R'000
7. Investments				
Interest in associate companies at valuation	–	–	5	5
Shares at cost	–	–	77	77
Permanent diminution in value	–	–	(72)	(72)
Group book value	7 919	7 919	–	–
Indebtedness	192	177	192	177
Provision for losses	(5910)	(5 365)	(94)	(79)
Carrying value - Annexure A	2201	2 731	103	103
Trade agreement	5 000	–	5 000	–
	7 201	2 731	5 103	103

	GROUP		CSIR	
	1993 R'000	1992 R'000	**1993 R'000**	1992 R'000
8. Interest in subsidiary – Annexure A	**–**	**–**	**27 220**	27 220
9. Debtors and prepayments				
Trade debtors	**42 053**	27 954	**42 053**	27 954
Prepaid expenses	**1 285**	3 055	**1 285**	3 055
Other	**7 424**	9 348	**7 424**	9 348
Loans to associate companies	**192**	177	**192**	177
As stated previously	**50 954**	40 534	**50 954**	40 534
Less: Loans to associate companies now included in investments – note 7	**192**	177	**192**	177
	50 762	40 357	**50 762**	40 357
10. Stock and contracts in progress				
Stock	**4 380**	5 700	**4 380**	5 700
Contracts in progress	**25 220**	20 564	**25 220**	20 564
	29 600	26 264	**29 600**	26 264
11. Advances received				
Advances on contracts received from clients	**33 412**	29 880	**32 384**	28 562
12. Creditors and provisions				
Trade creditors	**27 517**	24 148	**27 517**	24 148
VAT payable	**1 499**	1 786	**1 499**	1 786
Provision for self-insurance	**7 000**	–	**7 000**	–
Provision for accumulated leave	**12 741**	18 026	**12 741**	18 026
Provision for redundancy payments	**11 100**	–	**11 100**	–
Chamber of Mines – trade agreement	**5 000**	–	**5 000**	–
Other	**19 106**	20 793	**19 039**	20 789
	83 963	64 753	**83 896**	64 749

13. Contingent liability

An outstanding claim by the Foundation for Research Development amounting to R14 million, for accumulated cash reserves of the National facilities over and above the assets and liabilities transferred to them on 1 April 1991, is disputed. It is the opinion of the Board that this claim against the CSIR will not succeed.

14. Retirement benefits of employees

– Associated Institutions Pension Fund

All employees who joined the CSIR prior to 1 January 1993 were required to join the Associated Institutions Pension Fund, which is managed and controlled by Government. The previous actuarial valuation of the fund in 1988 revealed a material shortfall in funding of 48 per cent. It is reasonably expected that Government will assume responsiblity for the unfunded portion. The formula used to determine pensions is based on the final pensionable earnings, and the aggregate period of uninterrupted membership.

The fund is a defined benefit plan. Contributions are at the rate of between 18,24 and 24,32 per cent of pensionable emoluments of which members pay between 6 and 8 per cent. Employer contributions of R17,8 million and employee contributions of R8,6 million were paid over during the year.

Employer contributions are charged against income. The material shortfall in the funding of benefits will require increased employer contributions in the future, which in turn will increase the cost of employment relative to the market.

– CSIR Pension Fund

A CSIR Pension Fund was founded on 1 January 1993. All employees engaged after that date will become members of this fund, which is managed independantly by an insurance company. The fund is registered in terms of the Pension Fund Act, 1956 and is a shared benefit plan.

Contributions are at the rate of 20 per cent of pensionable emoluments of which members pay 7,5 per cent. Employer contributions of R34 668 and employee contributions of R20 774 were paid over during the year. Employer contributions are charged against income. All possible short-term liabilities of the Fund are fully insured. All future surplus funds will be applied towards the improvement of benefits.

15. Insurance and risk management

The insurance and risk management policies adopted by the CSIR are aimed at obtaining sufficient cover at the minimum cost to protect its asset base, earning capacity and legal obligations against unacceptable loss.

All fixed assets are insured at current replacement value. Risks of a possible catastrophic nature are identified and insured, while acceptable risks of a non-catastrophic nature are self-insured. Self-insurance was instituted for the first time during the year under review where the cost to benefit relationship exceeds the risk and the incidence of loss is of minor and infrequent nature. Self-insured risks are reviewed on an annual basis to ensure cover is adequate. An amount of R7 million is included in expenditure for the year as a transfer to a self-insurance fund to cover these risks. This amount is included in Creditors and provisions in the balance sheet. No major losses were experienced during the year under review. Claims of a general nature were adequately covered.

Interest in subsidiary and investments in associate companies.

Consolidated subsidiary	Issued Capital Rand	Effective holding 1993 %	Effective holding 1992 %	Financial year end	Shares at cost 1993 R'000	Shares at cost 1992 R'000
South African Inventions Development Corporation (SAIDCOR)	**27 220 193**	**100**	100	31 March	**27 220**	27 220

Associates	Issued Capital Rand	Effective interest 1993 %	Effective interest 1992 %	Financial year end	GROUP Carrying amount 1993 R'000	GROUP Carrying amount 1992 R'000
UNLISTED						
Woodchem Products (Pty) Ltd	**10 000**	**50.0**	50.0	31 August	**103**	103
Rockradar (Pty) Ltd	**100**	**25.0**	–	31 March	–	–
Impulse Deflection Measurement (Pty) Ltd	**1 000**	**25.0**	25.0	28 February	–	–
					103	103
Group associates						
Technology Finance Corporation (Pty) Ltd (Technifin)	5 200 000	**50.0**	50.0	30 June	**2 098**	2 628
Included in Technifin carrying value:						
Quality Electronics Developments (Pty) Ltd	1 000	**38.0**	38.0	30 June		
Icarisk (Pty) Ltd	1	**50.0**	50.0	30 June		
Fibretek Developments (Pty) Ltd	1 000	**25.0**	50.0	30 June		
Megalux Luminaries (Pty) Ltd	1 000	**25.5**	25.5	28 February		
MSB Detonator Co (Pty) Ltd	1	**50.0**	50.0	30 June		
LISTED						
Safety Technologies Limited	6 884 000	**17.0**	17.0	30 June		
Total interest in associates					**2 201**	2 731

Interests of the CSIR				
Net indebtedness		Net investment		General nature of business
1993 R'000	1992 R'000	1993 R'000	1992 R'000	
–	–	**27 220**	27 220	Investment in and development of research and implementation of technology.

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Cost or valuation		Indebtedness		Provision for losses		General nature of business
1993 R'000	1992 R'000	**1993 R'000**	1992 R'000	**1993 R'000**	1992 R'000	
5	5	**98**	98	–	–	Co-ordination, planning and directing the exploitation of intellectual property rights.
–	–	–	–	–	–	Exploitation of intellectual property rights.
–	–	**94**	79	**(94)**	(79)	Impulse deflection measurements.
5	5	**192**	177	**(94)**	(79)	
						The acquisition and transfer of technology to industry by licencing new inventions and providing finance to develop technology and venture capital for the exploitation thereof.
						The research, development, manufacture and marketing of electronic equipment.
						Dormant company.
						Development, distribution and selling of medical products.
						Manufacture and marketing of flameproof lights.
						Dormant company.
						Manufacture and supply of road signs and related road safety equipment and marketing of reflective material.
5	5	**192**	177	**(94)**	(79)	