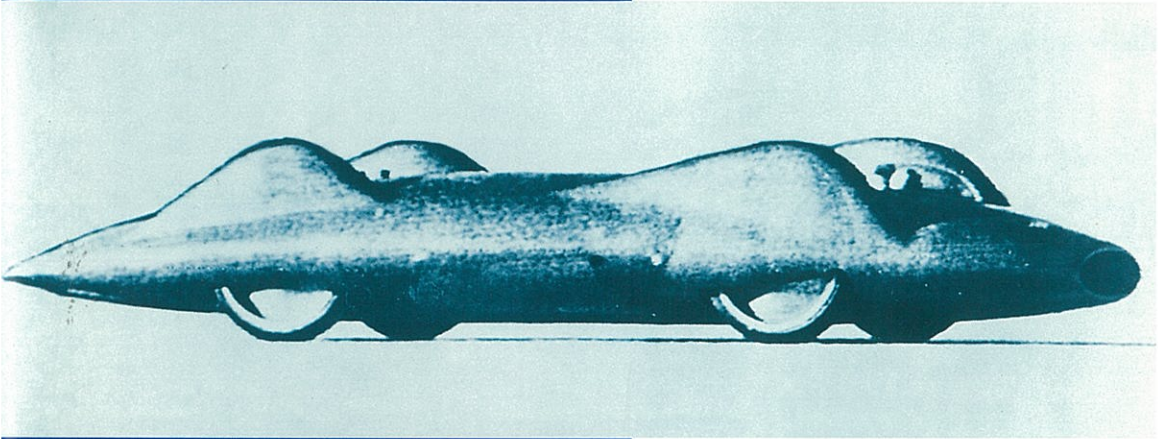


**Annual  
Report  
1992**



**CSIR**

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## CSIR Board

*From left to right, seated:*

**Dr W P Venter**  
**Mr P du P Kruger (Chairman)**  
**Dr L B Knoll**

*Standing:*

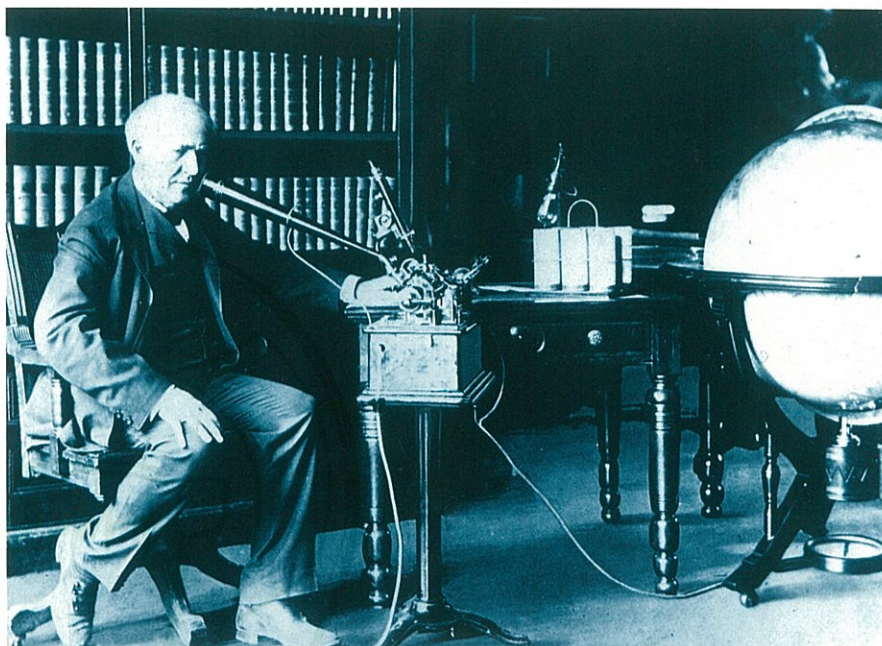
**Mr W C van der Merwe**  
**Mr J C Hall**  
**Dr J B Clark (President)**  
**Mr R A Plumbridge**  
**Dr H B Dyer**

(Mr E van As and  
Dr G S Sibiya  
were absent  
when this photograph  
was taken.)









## **Thomas Edison**

*At 14 he was delivering the news.*

*At 30 he was making it.*

*He grew up convinced science had  
only one role ... to benefit mankind.*

*To this end he devoted his enthusiasm,  
his energies, and his imagination.*

*If it wasn't for Thomas Edison,  
we couldn't have created this publication.*

*If it wasn't for his incandescent genius,  
we'd still be in the dark.*

*And if it wasn't for his driving ambition,  
to answer practical problems with practical  
solutions,*

*we wouldn't have a philosophy.*

## Chairman's Review



As in the period leading up to the CSIR's restructuring, the past year was characterised by momentous change. The collapse of the USSR caused the maps of the Soviet Union and Eastern Europe to be redrawn. Trade and other barriers continued to crumble, new alliances were forged, and, despite regional conflicts, hostility made way for greater international co-operation. In South Africa the majority of whites endorsed in a referendum State President F W de Klerk's reform initiative, thereby increasing the likelihood of a negotiated political settlement. Against this background, most economic sanctions and embargoes directed against South Africa have been repealed. This has opened up a world of opportunity, but has also paved the way for fierce competition for South African firms in local and overseas markets that were formerly closed to us.

Although the CSIR has gone a long way in the process of commercialisation, it will have to adjust to the reality of declining government funding and decreased research spending by government departments. The only way to make up for any decline in income from these sources will be to increase contract income and income derived from partnerships involving the private sector. The Board will seek to provide the necessary guidance and wise counsel to the top management team to help them achieve this aim.

The improved international political climate has meant that the CSIR can now openly work at strengthening its R&D ties with Africa, which has a great need for technology. The CSIR, with its technology partners, can provide appropriate and affordable technology to improve the quality of life throughout the African continent. The CSIR's Africa-specific expertise, built up over a period of almost 50 years, constitutes a unique strategic resource for developing solutions to some of the technological problems that beset Africa.

In a global context, South Africa cannot hope to compete with outdated technology. We need leading-edge technology, and we need to use it for market-related ends. A number of countries have been very successful in using and adapting technology developed elsewhere, without themselves

having a strong science base. Acquisition and modest adaptation of foreign technology in these countries are followed by the development of their own technological capabilities which stimulates investment in the sciences that underpin them. For this reason, the importation and adaptation of technology to meet specific needs and to create the basis for long-term development of indigenous capabilities should become important components of a local science and technology strategy.

The role of government in creating a macro-economic and regulatory framework conducive to technological innovation has been well documented world-wide. Technology and industrial policy are inseparable and should form an integral part of a country's overall economic policy. Since the literature shows that government itself cannot successfully develop technology, it must act as an enabler. It must provide overall guidance and formulate and implement sound economic and technological development strategies that allow the private sector to rapidly and efficiently adopt and upgrade technologies in response to market needs. Above all, the sociopolitical and economic environment provided by government should be competitive in a world competing for scarce capital resources and should be supported by a sound techno-commercial education strategy.

As Chairman of the Board, I would like to see the CSIR play an even more important role as a source of competitive technologies than in the past. There are many exciting embryonic technologies throughout the CSIR, and the challenge we face is to combine the elements of possible future technologies that are scattered among different disciplines into new, multidisciplinary technologies that meet the needs of the market place. The coming year will bring many exciting opportunities in this regard, especially in view of the possibilities for international co-operation which are presenting themselves.

Minister Org Marais, as Minister of Trade and Industry and of Tourism, was charged with responsibility for the CSIR from April 1991 until January 1992. Dr Marais has recently contributed to the development of a technology policy for South Africa,

and as a result of his efforts the CSIR now plays an important role in technology auditing for the Department of Trade and Industry. Under his able guidance the CSIR continued to prepare itself for the role it will play in a new South Africa. On behalf of the Board, I would like to thank him for his contribution to ensuring the continued success of the CSIR.

Minister Derek Keys succeeded Dr Marais on 20 January 1992 as Minister of Trade and Industry and for Economic Co-operation. He served on the Board of the CSIR from June 1991 and, because of his appointment as Minister, he resigned from the Board. I trust that the insight which he acquired into the activities of the organisation during his term of office as Board Member will stand him in very good stead, and I look forward to working with him.

This year will be extremely challenging. The economies of the industrialised nations have slowed down, and there is little hope of a speedy recovery. Under these circumstances we should not pin our hopes on an early inflow of foreign investment to rejuvenate our economy. This is a task which we South Africans will have to tackle ourselves. The CSIR is well positioned to make a major contribution to this national endeavour.



**Mr P du P Kruger**

Chairman





## Apollo

*When they first began  
they had nothing.  
Not even the assurance  
their venture would ever get  
off the ground.*

*Yet still they persisted,  
drawing from the one resource they  
had in abundance.*

*Imagination.*

*There are people,  
closer to home,  
who still believe that  
if something can be imagined  
it can be done.*



# **Executive Management's Review**

Political, social and economic changes are transforming our society. Democratisation, social integration, the removal of sanctions on the one hand and of protective trade measures on the other, and the growing needs of our rapidly expanding, urbanising population are transforming the environment in which science and technology are practised in South Africa.

A new environment, with the special demands it makes on all of us, requires new approaches and new forms of behaviour. We can no longer depend on the so-called "strategy of hope" which was a common research and development management method in large companies and research organisations in the 1950s. In terms of this strategy, research and development managers would hire the brightest minds, create generous research budgets, locate laboratories in campus-like surroundings and then hope – the hope being that scientists and engineers, left alone, would come up with new products and processes that would translate into revenues and market share.

## **Technology in a new South Africa**

This strategy is widely discredited and far from appropriate for South Africa. Instead, we need to manage our technology optimally to enable us to compete in a rapidly changing regional and global environment. As barriers between countries and between sectors within countries fall away, the global village is becoming ever more competitive. Information technology is increasingly allowing all nations access to technological innovation. For this reason, the only way for us to obtain a competitive edge is by distinguishing ourselves through superior implementation and management of technology.

Improved technology management at all levels of our society is the outcome of a learning process, not a ready-made or instant solution. It will require leadership, insight, a great deal of hard work, and time. We shall have to accept the challenge, however, if we wish to transform South Africa into a successful, democratic country with a vibrant economy that can meet the needs of its population and can act as a bridge for technology transfer into Southern Africa and Africa as a whole.

The past year presented the CSIR, and indeed South Africa, with an unprecedented com-



ination of challenges. The continuing recession, both locally and internationally, together with the high levels of turbulence in our society which resulted from massive sociopolitical transformation and the re-entry of South Africa into world affairs, provided an environment that presented new opportunities for the future development of our organisation.

## Challenges and opportunities

The benefits of increased contact between the members of the local scientific and technological community and their foreign counterparts were quickly evident after an extended period of isolation. This positive trend was counterbalanced by continuing tight economic conditions which adversely affected the ability of the private sector to invest in research and development. At the same time, changing government priorities continued to be reflected in cutbacks in many areas of public sector investment in contract research, including defence, transportation and energy.

*From left to right, standing:*

**Dr G G Garrett**

(Executive Vice-President:  
Operations)

**Mr A L Michau**

(Executive Vice-President:  
Finance and  
Management Services)

**Dr D F Toerien**

(Executive Vice-President:  
Operations)

*Seated:*

**Dr J B Clark**

(President)

**Mr M D Groch**

(Executive Vice-President:  
Marketing and  
Business Development)

**Mr R F Camphor**

(Executive Vice-President:  
Human Resource Services)

## International strategy

The CSIR has entered a new era in its international relations. Sanctions against South Africa and the CSIR as an organisation have hitherto denied us the opportunity of playing a more active role internationally and in Africa. During the course of the year, however, the process of ongoing political reform led to a remarkable shift in international attitudes to this country. This also opened up a large number of exciting opportunities for the CSIR. To ensure that the organisation exploits these opportunities to the full and approaches them in a focused and co-ordinated manner, a strategy was approved by the CSIR Board which is currently being implemented.

The major aim of our International Strategy is to position ourselves among the world's best sources of technology. We have initiated a number of exploratory activities aimed at establishing links with major players in the international technology arena, including state-funded and commercial contract research organisations, industrial companies with a strong research and development capability, and potential investors wishing to establish a technology-based industrial presence in this country.

Co-operation agreements were signed with the Industrial Technology Research Institute (ITRI) of the Republic of China; Laboratoria Technologico del Uruguay (LATU), the major technology laboratory of Uruguay; SECyT, the Argentinian Secretariat of Science and Technology; and the Malawian Ministry of Works.

A number of initiatives aimed at re-establishing people-to-people contact were also undertaken. During the year senior delegations and individuals were received from, *inter alia*, the German Parliament; the European Parliament; the Commission of European Communities; the Finnish foreign trade association; the Czechoslovakian foreign trade ministry; the French Chamber of Commerce and Industries of Southern Africa; the Executive Council of the International Union for Pure and Applied Chemistry; LATU, the major technology laboratory of Uruguay; the Office of Science and Technology Advisors of the Republic of China; the USSR Academy of Science; the Western European Calibration Co-operation; the Kenyan scientific community; the Centre National de la

## Corporate goals met

In an environment which was characterised by significant pressure on our traditional markets of both defence and public sector contracts, the CSIR managed to increase external sales by 9,2 per cent over 1990/91. In addition, although Parliamentary investment in the CSIR was cut by 1 per cent, we ended the year with a surplus of R24 million, maintaining our sound financial position. Sales to the private sector increased by 25 per cent, while royalty income grew by 126 per cent. These achievements required significant effort throughout the organisation.

The CSIR Board established specific corporate goals for technology management, financial performance, product development, and strategic quality management. All corporate goals have a short and longer term component, and in all cases of significance organisational performance has met expectations.

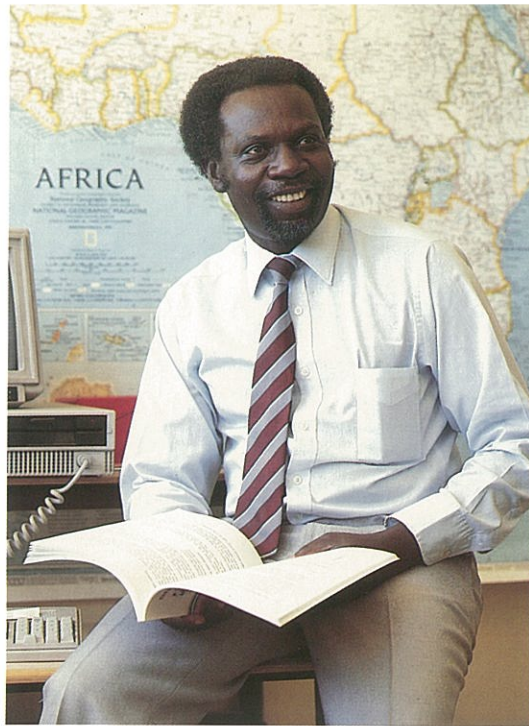
Recherche Scientifique (CNRS), France; the Hungarian Academy of Engineering; and the Polish Academy of Sciences.

This new climate of co-operation has created formidable challenges for the CSIR International Services (CSIRIS) Offices in Washington, Bonn and London.

More than forty years of dealing with technology-related problems in Africa has given us a unique understanding of the needs of the various components, First and Third World, urban and rural, of Southern African communities. Our Africa Strategy, which forms an integral part of our International Strategy, seeks to harness the full scope of this Africa-specific expertise. A network of representatives has been established in a number of African countries to assist our "into Africa" drive. In addition, a number of projects are currently being pursued, some in collaboration with industrial partners, in response to specific requests by African governments for CSIR involvement. Our participation in the Lesotho Highlands Water Project (see *Technology Impact*) is a good example of our increasingly important role as the technology partner of Africa.

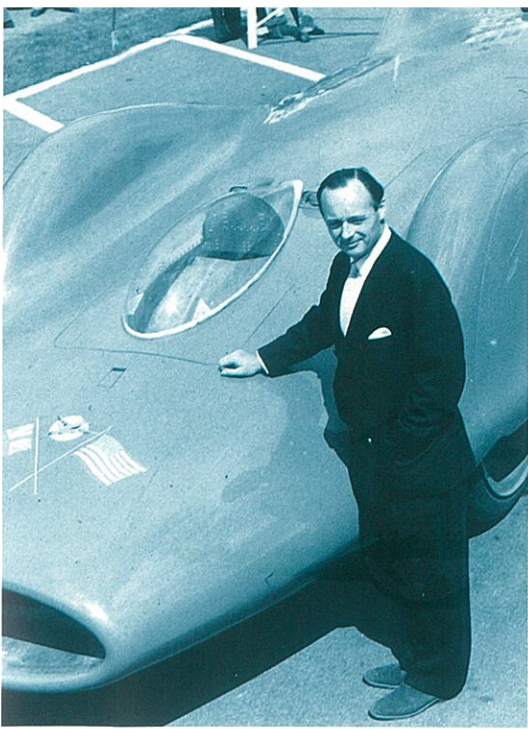
During the year we also actively sought to expand our interaction with development agencies to facilitate our technology transfer activities in Africa. The CSIR is now registered as a consultant with the World Bank and the Deutsche Gesellschaft für Zusammenarbeit.

In response to the rapidly changing competitive environment, the CSIR's core mission statement has been amended to emphasise the importance which the organisation attaches to providing technology through the implementation of research and development. The revised mission statement reads as follows:



### **Ongoing organisational development**





## **Donald Campbell**

*They said, the man who believed  
he could break the land  
and water speed records  
in one year  
was a fool or a dreamer.*

*But there is a universal truth  
his critics chose to ignore.*

*When you take  
the conviction of science,  
a man of courage,  
and the imagination of both,  
all things are possible.*

*Seven minutes before dusk  
on the last day of the year,  
they proved to all men that  
if it can be imagined,  
it can be done.*



*The CSIR's business is to perform research and development to gain technology and thereafter to ensure its implementation in order to:*

- *be the technology partner of South African industry in both the formal and informal sectors to promote economic growth*
- *provide scientific and technological support to enhance decision-making in the public and private sectors*
- *provide technology solutions that improve the quality of life in urban and rural developing communities.*

Achieving excellence in the first thrust area outlined by our mission statement requires us to aggressively advance our role as the technology partner of South African industry, big and small business alike, and the informal sector, to enable them to compete profitably in South African, African and global markets.

The 1991 Corporate Strategy accordingly placed heavy emphasis on the need to continue the process of organisational development within the framework of strategic units in selected market areas; the need to identify and strengthen the organisation's core competencies and core products; and the need to standardise approaches to strategic analysis, planning and control throughout the organisation.

In order to streamline organisational activities in the important area of information technology, the Board approved the restructuring of the Centre for Advanced Computing and Decision Support, the Division of Information Services, and the Management Information Systems Programme into one Strategic Unit under the aegis of the Division of Information Services.

The second thrust area defined by the core mission expresses the commitment of the CSIR to enhancing the quality of decision-making, by supplying policy makers in the public and private sector with information extracted from research and development. One component in pursuit of this aim is a Policy Studies Unit, reporting to the President, which was established by the CSIR Board. In January 1992 Dr Gideon de Wet was appointed to head this function.



A first report focused on a review of the role of science and technology policies in economic development in 17 countries. The report was widely disseminated and well received. More recently, a report entitled *An Audit on the Science Policy and System of the RSA* was submitted to the Department of National Education. The Policy Studies Unit will continue to play a major role in our corporate technology management initiatives. A second component relates to the provision of knowledge-based or geographical information systems-based decision support systems. We develop these systems mostly under contract to specific clients or partners.

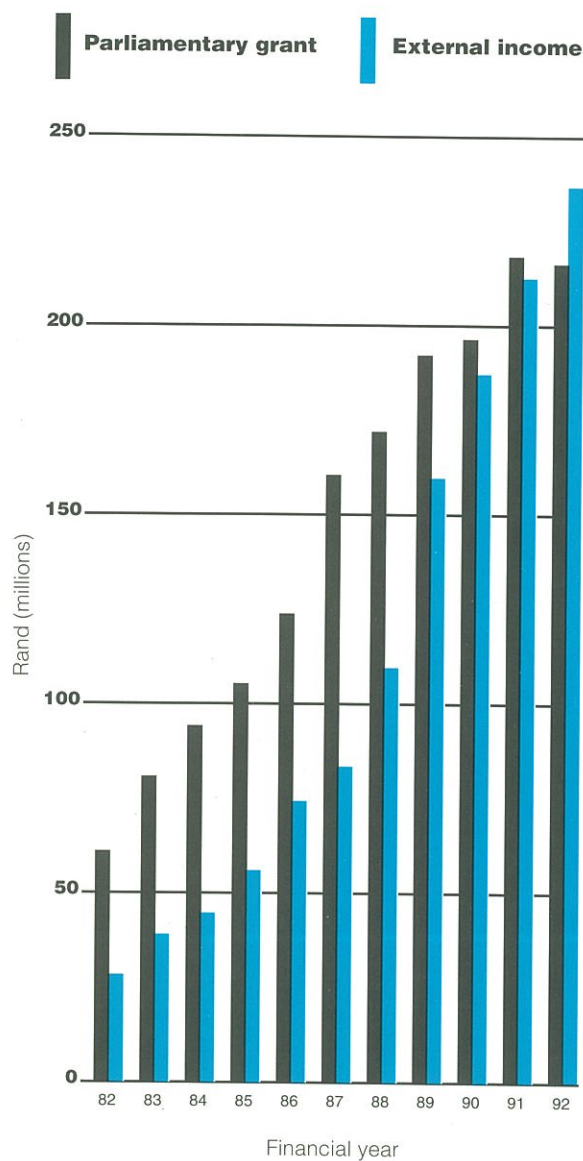
The importance which we attach to the third thrust area described in the core mission statement, namely support for developing communities, found expression in the creation of a third corporate programme. The Corporate Programme for Developing Communities was added to the two existing cross-cutting functions, Mining and Environmental Services, which have been designed to integrate the CSIR's total resource base. The new Programme will integrate a wide range of CSIR products and services which at present directly or indirectly make a contribution to improving the quality of life in developing urban and rural communities.

During the past year, the CSIR played host to a number of influential local and foreign decision-makers, including Dr Nelson Mandela, President of the ANC, and an ANC delegation, and Mrs Margaret Thatcher, former British Prime Minister. Numerous eminent foreign scientists and representatives of industrial and commercial bodies and organisations also visited the CSIR – during the course of the year we received some 110 high-level delegations from all over the world.

Ovid, a two-seater turboprop trainer aircraft designed and built by the CSIR with Armscor support, took to the air. It is the first aeroplane with an all carbon fibre composite airframe to be built in South

### **Some other events of note**

**Total  
Income**  
(Figure 1)



Africa, and puts us at the cutting edge of the application of composite materials technology.

The Environmental Services Programme was asked to carry out the second and third phases of the environmental impact assessment to assess the impact of two possible land-use options at Eastern Shores, St Lucia. A National Report to the United Nations Conference on Environment and Development, entitled *Building the Foundation for Sustainable Development in South Africa*, was completed for the Department of Environment Affairs. A number of environmental management projects were also completed for clients in the public sector and in the mining and paper and pulp industries.

The Mining Programme continued to strengthen its ties with the industry and to integrate the marketing of mining-related products and services by the Divisions.

A CSIR team, working in collaboration with the firm of architects Marais, Pretorius and Wenhold, produced the winning entry in an international competition for the design of the Engela Mission Hospital in northern Namibia and a development plan for all health facilities in the region.

The comprehensive information services that comprise the Worldnet Intelligent Gateway are set to give South African corporate information users access to global knowledge at a keystroke.

The application by South Africa's National Calibration Service (NCS) – which is managed by the CSIR – for formal recognition by the Western European Calibration Co-operation was accepted. This development holds important benefits for the local manufacturing industry, especially in view of the lifting of customs barriers in a unified Europe in 1992.

CSIR founder and physicist, Sir Basil Schonland, was honoured on a commemorative stamp issued by SA Post Office Ltd.

### Financial results

The Financial Statements show that we ended the year with a surplus of R22,7 million. This achievement can be attributed mainly to an increase in

certain income categories (in particular, sales to the private sector increased by 25 per cent, and royalty income grew by 126 per cent) and determined efforts to keep down cost increases in all areas of activity.

Improved debtor management reduced by R6,1 million, or 13 per cent, the amount of money in our debtors' account.

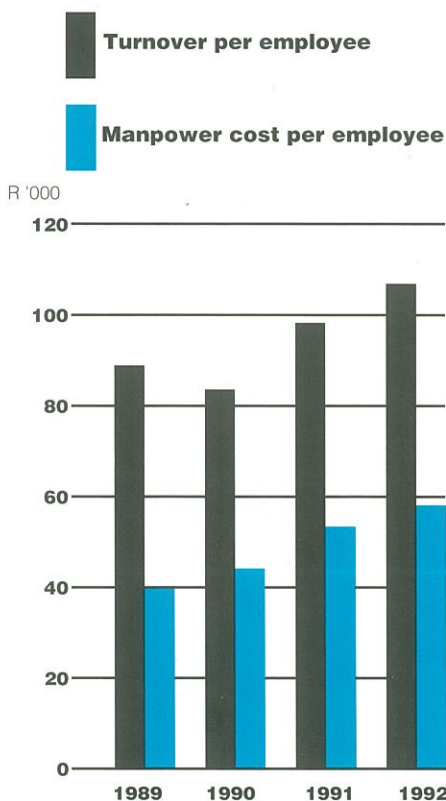
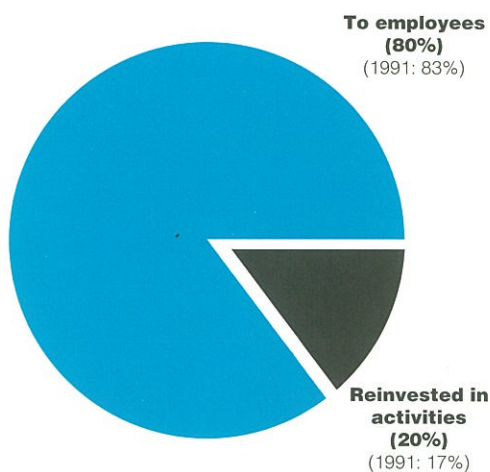
Figure 1 shows the effect of the reduction in the Parliamentary Grant, which was offset by the 8,5 per cent increase in external sales over 1990/91. External sales will need to grow at an even faster rate if Government continues to cut the Parliamentary grant.

The extent to which the CSIR depends on its human resources is reflected by Figure 2, which shows that of the total value created by the organisation 80 per cent was apportioned to employees. The replacement of fixed assets stabilised at approximately 20 per cent of total value created.

Although we managed to increase the average turnover per employee (Figure 3), the manpower cost per employee also increased by the same percentage.

Technology Finance Corporation (Pty) Ltd (Technifin), in which the CSIR and the Industrial Development Corporation are equal partners, has investments in new companies, in collaboration with partners, amounting to R5,8 million. Investments in product development, in collaboration with established companies, amount to R2,7 million. Transactions approved, most of which will fall under the new financial year, amount to a further R5,9 million. Some of Technifin's investments are showing great promise. Quality Electronic Developments (Pty) Ltd (QED), a company which was founded 3 years ago in collaboration with an individual entrepreneur to develop and market an electronic plotter, is already exporting the product to Europe, and the company's prospects are very encouraging. QED also won the Technology Top 100 award in the electronics category. Another investment, Fibretek Developments (Pty) Ltd, which Technifin established in collaboration with two entrepreneurs to develop and market a product used by optometrists, is also being exported to countries in Europe.

### Apportionment of value created (Figure 2)



### Average turnover per employee (Figure 3)

## Human resources

Personnel turnover for the year, calculated on the basis of controllable resignations, amounted to 10,6 per cent, with personnel turnover for scientists and engineers being 9,2 and 10 per cent, respectively. It is clear that tough economic conditions in the RSA

had a major impact on the mobility of personnel, contributing to the greater stability of the CSIR's personnel corps.

The personnel complement declined by 390 from 3 817 in April 1991 to 3 427 in March 1992. This reduction can be attributed mainly to natural attrition and improved working methods.

Owing to the very difficult market conditions, in particular cutbacks by government departments, with which a number of our Divisions have to contend, we anticipate that the personnel complement could decline further as a result of redundancies during the coming year. This situation is being managed with great circumspection.

The corporate objective of a three-star NOSA safety grading was achieved, following an evaluation during July 1991. The CSIR also received a trophy from NOSA for being the organisation which made the most progress with safety management in the Northern Transvaal region. We also succeeded in keeping the disabling frequency rate for the year below our target rate of 5 per cent. The safety management system was extended to include a number of components which are not covered by the formal NOSA system.

Personnel training received considerable attention, and the total investment for the year in this field amounted to approximately R4 million.

Human Resource Services started using a new computerised information system, which is helping them to provide a more efficient and user-friendly service.

Several steps were taken to broaden the scope of the affirmative action programme in a constructive manner. We focused on the recruitment of black graduate and postgraduate bursars, the appointment of black graduates and returned expatriates, the upgrading of the skills of black low-level personnel, and postgraduate training of our black graduate employees. Specific targets have also been set to guide the positive development of this programme, to ensure that the country's racial composition is more accurately reflected by all employee levels within the CSIR.



## Personalia

The six recipients of the Outstanding Achiever Awards for 1991 were Dr Colin Boothroyd, Baby Ramahotswa, Johan Olivier, Dr Peter Ashton, André van der Bergh, and Mike Marsh. The awards recognised their outstanding individual contributions to corporate efforts in, respectively, metallurgical investigation services, technology transfer to developing communities, the synthesis of artificial sweeteners, water quality, occupational safety, and electronic detonators. Floris van Zyl of the Division of Production Technology received the De Beers Technology Transfer Award for his standard of workmanship and his ability to motivate the staff of several companies in the implementation of quality management.

Three programmes from the Division of Materials Science and Technology, in a team with Atlas Aircraft and Armscor, won one of the two 1991 Armscor Awards for the best project of the year. They contributed to the contract work on developing technology related to special-purpose alloys, ceramics and coatings.

Dr Brian Clark was appointed Chairman of the Committee of Heads of Scientific Councils in August 1991.

Mr Paul Kruger became the new Chairman of the Board on 1 July 1991, in the place of Dr Louw Alberts, who retired from the Board. Dr Alberts was the first non-executive Chairman of the Board under the new CSIR Act, and we thank him for his major contribution to the CSIR during a period of great change.

Mr John Hall, Executive Director, Barlow Rand Limited, and Mr Carel van der Merwe, Managing Director, Industrial Development Corporation of South Africa Limited, were appointed to the Board from 1 July 1991 and 1 January 1992, respectively. We welcome both these gentlemen and look forward to benefitting from their skills, expertise and insight.

The terms of office of Prof D R Woods and Mr P J van Rooy ended on 31 May and 31 December 1991, respectively. Their valuable contribution to the CSIR is acknowledged with gratitude.



**Dr J B Clark**

President

**Relatório Annual  
do CSIR  
para 1992:  
Resumo**

O continuo retrocesso, não só local mas também internacional, à elevada instabilidade de nossa sociedade, concatenados com a maciça transformação sócio-política, e a reentrada da África do Sul nos interesses mundiais, deram ao CSIR uma combinação excepcional de oportunidades e estímulos durante o ano de 1991.

Os benefícios de contacto crescente com a comunidade internacional da ciência e da tecnologia compensaram o retrocesso e os cortes nas despesas na maioria dos sectores do Governo, incluindo uma redução na percentagem da distribuição de verbas pelo Parlamento para o CSIR.

No entanto, o CSIR conseguiu aumentar as vendas externas em 8,5% durante o período 1990/91. A organização terminou o ano com um excesso de R22,7 milhões de Randes, mantendo a sua boa posição financeira. As vendas ao sector privado aumentaram em 24%, enquanto o rendimento dos direitos de patentes subiu em 126%.

Na área internacional, o CSIR entrou numa nova era. A sua Direcção aprovou uma Estratégia Internacional, que está a ser executada e que visa colocar o CSIR entre as melhores fontes de tecnologia. A organização iniciou também um número de actividades exploratórias, visando estabelecer ligações

a nível internacional, com os principais participantes na área internacional da tecnologia.

Foram assinados acordos de cooperação com o Instituto de Investigações de Tecnologia Industrial (ITRI) da República da China; a Laboratorio Tecnológico del Uruguay (LATU), o principal de Uruguai, e com o Secretariado argentino da Ciência e da Tecnologia (SECyT).

A Estratégia de África, que faz parte integrante da Estratégia Internacional, levou a um acordo com o Ministério de Obras Públicas de Malawi. Um número de projectos está, actualmente, em curso em resposta aos pedidos específicos de governos africanos para a participação do CSIR.

Visando facilitar as nossas actividades na transferência de tecnologia em África, nós -

- inscrevemo-nos no Banco Mundial como consultantes;
- inscrevemo-nos no <Deutsche Gesellschaft für Zusammenarbeit> como consultantes.

Alguns dos pontos culminantes do ano (ver também o documento de Impacto) foram:

- A aprovação do requerimento pelo Serviço Nacional de Calibragem (SNC) da África do Sul - o qual é administrado pelo CSIR - para a reçoção pela Cooperação em Calibragem da Europa Occidental (CCEO)
- A construção do Ovid, um avião instructor turbopropulsor de dois lugares, desenhado e construído pelo CSIR e Armscor. Foi o primeiro avião construído na África do Sul com uma estrutura aérea feita totalmente de fibra de carvão.
- A equipa do CSIR, em colaboração com uma firma de arquitectos, desenhou o modelo vencedor num concurso internacional dum hospital missionário no norte da Namíbia e elaborou um plano de desenvolvimento de instalações de saúde na região.
- O enorme progresso feito com os serviços de informação que abrangem o "Worldnet Intelligent Gateway" (Rede Mundial de Informação). Estes serviços darão aos utentes sul-africanos corporativistas e privados de computadores o acesso à informação global dum só golpe.

## Rapport annuel du CSIR pour 1992: Résumé

Le CSIR a dû faire face à un concours exceptionnel d'occasions et de défis pendant l'année 1991: la récession locale et mondiale, les niveaux élevés d'agitation sociale liés à une transformation socio-politique profonde, et le retour de l'Afrique du Sud dans les affaires du monde.

Les avantages d'un contact accru avec la communauté internationale scientifique et technologique ont été contrecarrés par la récession et par des restrictions budgétaires dans la plupart des secteurs, y compris une réduction d'un pour cent dans la subvention parlementaire au CSIR.

Malgré une situation difficile, le CSIR est néanmoins parvenu à augmenter ses ventes de 8,5 pour cent par rapport à l'année 1990/1991, et a fini avec un surplus de R22,7 millions, conservant ainsi sa situation financière solide. Les ventes au secteur privé ont augmenté de 24,7 pour cent, tandis que les revenus venant des redevances ont augmenté de 126 pour cent.

Au niveau international le CSIR est entré dans une nouvelle ère. Une Stratégie Internationale ayant comme but de situer le CSIR parmi les meilleures sources mondiales de la technologie a été approuvée par le Conseil du CSIR et est actuellement mise à exécution. Le CSIR explore également des possibilités afin d'établir des liaisons avec les joueurs les plus importants dans l'arène internationale de la technologie.

Des accords de coopération ont été signés avec l'Institut de Recherche Industrielle Technologique (ITRI) de la République de Chine, avec le Laboratoria Tecnológico del Uruguay (LATU), le plus grand établissement technologique en Uruguay, et avec le SECyT, le Secrétariat Argentin de la Science et de la Technologie.

La Stratégie Africaine, qui fait partie intégrante de la Stratégie Internationale, a débouché sur un accord avec le Ministère des Travaux publics du Malawi. De nombreux projets sont actuellement en cours suite à des demandes particulières de certains gouvernements africains désireux de la participation du CSIR.

Afin de faciliter notre transfert de la

technologie vers l'Afrique, nous avons entrepris les démarches suivantes:

- inscription en tant qu'Institut conseil auprès de la Banque Mondiale;
- inscription en tant qu'Institut conseil auprès de la Deutsche Gesellschaft für Zusammenarbeit.

Quelques grand moments de l'année (voir aussi le document *Technology Impact*) ont été:

- La ratification de la demande soumise par le National Calibration Service (NCS) (le Service national d'étalonnage) sud-africain – administré par le CSIR – pour une reconnaissance formelle de la part de la Western European Calibration Cooperation (WECC) (le comité ouest-européen de coopération pour l'étalonnage).
- L'avion-école Ovid à deux places et à turbo-propulseur, conçu et réalisé par le CSIR en collaboration avec Armscor, a volé pour la première fois. Ovid est le premier appareil réalisé en Afrique du Sud avec une cellule entièrement en composite de fibre de carbone.
- Une équipe du CSIR, avec le concours d'un cabinet d'architectes, a présenté l'inscription gagnante dans une compétition internationale pour la conception d'un hôpital de mission dans le nord de la Namibie ainsi qu'un plan de développement pour toutes les installations sanitaires de la région.
- Beaucoup de progrès ont été fait quant aux services de renseignements compréhensifs qui comportent le Worldnet Intelligent Gateway. Ces services mettront la connaissance mondiale à la disposition d'individus et d'entreprises sud-africains en possession d'un ordinateur, simplement en frappant une touche.



## CSIR

### Jahresbericht

1992:

### Zusammenfassung

Das vergangene Geschäftsjahr war geprägt durch die anhaltende wirtschaftliche Rezession im In- und Ausland, durch starke innere Unruhen und gesellschaftspolitische Umwälzungen sowie durch die Rückkehr Südafrikas in die Weltöffentlichkeit. Das Zusammenwirken all dieser Ereignisse stellte den CSIR vor eine ungewöhnliche Kombination aus neuen Herausforderungen und Möglichkeiten, aber auch Schwierigkeiten.

Die Vorteile, die sich dem CSIR aus neu geschaffenen Kontakten mit internationalen wissenschaftlichen und technischen Gremien eröffneten, wurden durch die Rezession sowie durch Kürzungen in den staatlichen Ausgaben in den meisten Bereichen – einschließlich einer Kürzung der Parlamentszulage an den CSIR um 1 Prozent - weitgehend kompensiert.

Trotz dieser Schwierigkeiten konnte der CSIR seinen Erls aus Drittmitteln im Vergleich zum Geschäftsjahr 1990/1 um insgesamt 8,5 Prozent erhöhen. Am Ende des Jahres wies die Organisation einen überschuß von 22,7 Millionen Rand auf und konnte somit ihre gesunde finanzielle Lage aufrechterhalten. Während der Erls aus Dienstleistungen an den Privatsektor um 25 Prozent zunahm, steigen die Einnahmen aus Lizenzverträgen sogar um 126 Prozent.

Auf internationaler Ebene stand der CSIR am Anfang eines neuen Zeitabschnittes. Eine neue Strategie mit der Zielsetzung, den CSIR als einen der weltweit führenden Technologieanbieter zu profilieren, erhielt die Zustimmung des Verwaltungsrates und wird gegenwärtig in die Tat umgesetzt. Darüber hinaus hat die Organisation eine Reihe von Maßnahmen ergriffen, um neue partnerschaftliche Beziehungen zu wichtigen internationalen Vertretern aus Industrie und Forschung

aufzubauen.

Mit dem Taiwanesischen Forschungsinstitut für Industrielle Technik (ITRI), dem Laboratorio Tecnológico del Uruguay (LATU) – der größte Forschungs-anstalt Uruguays – und dem Argentinischen Sekretariat für Wissenschaft und Technologie (SECyT) wurden Kooperationsverträge unterzeichnet.

Im Rahmen der Afrikastrategie, die ein fester Bestandteil unserer internationalen Strategie ist, wurde ein Abkommen mit dem Ministerium für öffentliche Bauten in Malawi abgeschlossen. Mehrere Projekte für afrikanische Regierungen, die sich mit spezifischen Ansuchen an den CSIR wandten, werden zur Zeit bearbeitet.

Um den Technologietransfer mit Afrika zu erleichtern, hat der CSIR sich bei der Weltbank und bei der Deutschen Gesellschaft für Zusammenarbeit als Beratungsfirma registriert.

Einige Höhepunkte des Jahres (siehe auch *Technology Impact*):

- Der Antrag des südafrikanischen Eichamtes (National Calibration Service, NCS), formell vom westeuropäischen Eichverband (WECC) anerkannt zu werden, wurde angenommen.
- Ovid, ein zweisitziges Schulflugzeug mit PTL-Triebwerk, welches vom CSIR und Armscor entworfen und gebaut wurde, hat alle Flugproben bestanden. Es ist das erste in Südafrika hergestellte Flugzeug mit einer Zelle aus kohlenstoffaserverstärktem Compositwerkstoff.
- Ein CSIR-Team, in Zusammenarbeit mit einem Architekturbüro, gewann einen internationalen Wettbewerb für den Entwurf eines Missionskrankenhauses im Norden Namibias, einschließlich eines Entwicklungsplanes für sämtliche Einrichtungen des Gesundheitswesens im Einzugsgebiet.
- Gute Fortschritte wurden mit dem umfassenden Informationsdienst gemacht, einschließlich Zugang zum Worldnet Intelligent Gateway. Somit wird es südafrikanischen Firmen und Privatpersonen ermöglicht, Wissen und Kenntnisse aus aller Welt durch Tastendruck über ihren eigenen Computer zu erhalten.

**Financial  
Statements  
1992**

# Balance Sheet

31 March 1992

	Notes	1992 R'000	1991 R'000
<b>Capital employed</b>			
Capital account	4	428 626	428 626
General reserve	5	57 923	35 255
		<b>486 549</b>	463 881
<b>Employment of capital</b>			
Fixed assets	6	295 619	304 980
Investments	7	27 297	27 225
Net current assets		163 633	131 676
Current assets		<b>256 944</b>	232 560
Debtors and advances		40 534	46 593
Stock and contracts in progress	8	26 264	22 828
Cash and short-term deposits		190 146	163 139
Current liabilities		93 311	100 884
Advances received		28 562	39 410
Creditors and accrued expenses		64 749	61 474
		<b>486 549</b>	463 881

A L MICHAU

**Executive Vice-President**

J B CLARK

**President**

The Annual Financial Statements of the CSIR have been audited in terms of sections 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 1992 and the results of its operations for the year then ended.

# Income Statement

31 March 1992

	Notes	1992 R'000	1991 R'000
<b>Income</b>			
Parliamentary grant		<b>210 008</b>	212 376
Contract income		<b>194 680</b>	179 495
Sundry income		<b>13 756</b>	7 663
		<b>418 444</b>	399 534
<b>Expenses</b>			
Salaries		<b>229 926</b>	215 520
Depreciation		<b>35 630</b>	26 687
Running expenses	15	<b>155 853</b>	159 764
		<b>421 409</b>	401 971
<b>Deficit for the year before interest</b>		<b>2 965</b>	2 437
Interest		<b>25 633</b>	21 548
<b>Net surplus transferred to general reserve</b>	9	<b>22 668</b>	19 111

# Income Statement

31 March 1992

Notes	1992 R'000	1991 R'000
<b>Income</b>		
Parliamentary grant	<b>210 008</b>	212 376
Contract income	<b>194 680</b>	179 495
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Interest	<b>25 633</b>	21 548
<b>Net surplus transferred to general reserve</b>	9 <b>22 668</b>	19 111

# Cash Flow Statement

31 March 1992

	Notes	1992 R'000	1991 R'000
<b>Cash available from operating activities</b>		<b>55 036</b>	54 352
<b>Cash generated by operations</b>		<b>34 353</b>	29 007
Deficit before interest income		<b>2 965</b>	2 437
Adjusted for assets written off	10	<b>1 688</b>	4 757
Adjusted for depreciation		<b>35 630</b>	26 687
<b>Cash (utilised)/generated by an (increase)/decrease in working capital</b>	11	<b>(4 950)</b>	3 797
<b>Cash generated from interest income</b>		<b>25 633</b>	21 548
<b>Cash invested to maintain operations</b>			
Fixed assets acquired	12	<b>27 957</b>	34 981
<b>Cash generated</b>		<b>27 079</b>	19 371
Investment in Impulse Deflection Measurements(Pty) Ltd		<b>72</b>	-
Decrease in the loan to the National Facilities		-	(9 289)
Funds transferred to the Foundation for Research Development	13	-	20 706
Increase in cash and short-term deposits		<b>27 007</b>	7 954
<b>Cash utilised</b>		<b>27 079</b>	19 371

# Value Added Statement

31 March 1992

	Notes	1992 R'000	%	1991 R'000	%
<b>Turnover</b>	14	417 742	145	396 339	154
Paid to suppliers for goods and services		155 853	54	159 764	62
<b>Value added</b>		261 889	91	236 575	92
Interest earned		25 633	9	21 548	8
<b>Total value created</b>		287 522	100	258 123	100
<b>Transfer to general reserve</b>		(22 668)	(8)	(19 111)	(7)
<b>Capital expenditure</b>	6	27 957	10	34 981	14
<b>Total value released</b>		292 811	102	273 993	106
<b>Apportioned as follows:</b>					
<b>Employees</b>					
Salaries, wages and other manpower costs		229 926	80	215 520	83
<b>Maintenance of fixed asset base</b>					
Depreciation		35 630	12	26 687	10
Net acquisition of fixed assets		27 255	10	31 786	13
● Fixed assets acquired	12	27 957	10	34 981	14
● Proceeds on disposal of fixed assets		702	0	3 195	1
<b>Total value apportioned</b>		292 811	102	273 993	106

# Notes to the Financial Statements

31 March 1992

## 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 in 1.5 the principal accounting policies are consistent with those followed in the previous year.

### 1.1 Foreign currencies

Assets and liabilities in foreign currencies are converted to South African rand at the rate of exchange ruling at year end or rates stipulated in forward exchange contracts. Conversion differences are dealt with in the income statement. Transactions during the year are converted to 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.

### 1.2 Fixed assets

All assets costing R2 000 (1991: R1 000) or less are written off when purchased. Land and buildings are stated at cost. Equipment and vehicles are stated at cost less accumulated depreciation. Depreciation is calculated on the straight line basis at rates considered appropriate to reduce book value to one rand over the estimated useful life of the asset.

### 1.3 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.

### 1.4 Investments

Investments are stated at cost.

### 1.5 Changes in accounting policies

#### *Discontinuance of reserve accounting:*

Income specifically earmarked for the funding of assets as well as the write off of assets, previously accounted for directly in the capital account, are now reflected in the income statement.

#### *Change in the basis of accruing for accumulated leave pay:*

The full amount due at year end in respect of accumulated leave pay has been accrued. Previously the amount was only partially accrued on the basis of expected future cash payments to employees.

The effect of these changes is set out in note 9.

## 2. Transfer of the National Facilities to the FRD

The National Accelerator Centre, the Radio Astronomy Observatory and the South African Astronomical Observatory were transferred to the Foundation for Research Development on 1 April 1991. The 1991 comparatives have been restated accordingly (see note 16).



### 3. Contingency

An outstanding claim from the Foundation for Research Development amounting to R25,6 million for accumulated cash reserves, over and above the assets and liabilities transferred to them on 1 April 1991, is in dispute.

### 4. Capital account

	1992 R'000	1991 R'000
Opening balance as stated previously	551 125	540 787
Less: Change in accounting policy – note 9	17 869	–
Adjusted opening balance	533 256	540 787
Less: Opening balance attributable to the Foundation for Research Development	–	8 878
Less: Opening balance attributable to the Foundation for Research Development in respect of the National Facilities	104 630	104 630
• Before change in accounting policy	113 255	113 255
• Change in accounting policy – note 9	8 625	8 625
Restated opening balance	428 626	427 279
Plus: Assets of the South African Forestry Research Institute	–	1 347
• Cost	–	6 155
• Accumulated depreciation	–	4 808
	428 626	428 626

### 5. General reserve

Opening balance as stated previously	45 220	47 264
Plus: Change in accounting policy – note 9	6 069	(11 800)
• Adjustment for discontinuance of reserve accounting	17 869	–
• Adjustment in respect of accumulated leave which accrued prior to 1991 – note 9	(11 800)	(11 800)
Adjusted opening balance	51 289	35 464
Less: Opening balance attributable to the Foundation for Research Development	–	19 320
Less: Opening balance attributable to the Foundation for Research Development in respect of the National Facilities	16 034	–
• Before change in accounting policy	7 409	–
• Change in accounting policy – note 9	8 625	–
Restated opening balance	35 255	16 144
Plus: Surplus transferred from income statement	22 668	19 111
• Before change in accounting policy	7 095	9 867
• Change in accounting policy – note 9	15 573	9 244
	57 923	35 255

## Notes to the Financial Statements (continued)

### 6. Fixed assets

	Land and buildings	Equipment	Vehicles	1992 Total	1991 Total
	R'000	R'000	R'000	R'000	R'000
<b>Cost</b>					
<b>Opening balance</b>	<b>142 224</b>	<b>401 976</b>	<b>2 625</b>	<b>546 825</b>	516 637
Relinquished to the FRD	43 938	76 818	26	<b>120 782</b>	119 134
<b>Restated opening balance</b>	<b>98 286</b>	<b>325 158</b>	<b>2 599</b>	<b>426 043</b>	397 503
Additions	7 430	20 487	40	<b>27 957</b>	41 136
Disposals	—	10 244	329	<b>10 573</b>	12 457
Relinquished	—	140	—	<b>140</b>	139
<b>Closing balance</b>	<b>105 716</b>	<b>335 261</b>	<b>2 310</b>	<b>443 287</b>	426 043
<b>Accumulated depreciation</b>	<b>—</b>	<b>145 806</b>	<b>1 862</b>	<b>147 668</b>	121 063
	<b>105 716</b>	<b>189 455</b>	<b>448</b>	<b>295 619</b>	304 980

Land and buildings are unencumbered.

### 7. Investments

	% Holding	1992 R'000	1991 R'000
South African Inventions Development Corporation	100	<b>27 220</b>	27 220
Woodchem (Pty) Ltd	50	<b>5</b>	5
Impulse Deflection Measurements (Pty) Ltd	25	<b>72</b>	—
		<b>27 297</b>	27 225

The Board considers the above values to be fair.

### 8. Stock and contracts in progress

	1992 R'000	1991 R'000
Stock	<b>5 700</b>	6 189
Contracts in Progress	<b>20 564</b>	16 639
	<b>26 264</b>	22 828

## 9. Effect of the changes in accounting policies

Two changes in accounting policies took place during the year (see note 1) as follows:

*Discontinuance of reserve accounting:*

The effect on the income statement figures for the year and the 1991 comparatives is set out below.

*Change in the basis of accrual for accumulated leave pay:*

The accumulated effect before 1991 of R11 800 000 has been disclosed as an adjustment to the general reserve opening balance (see note 5).

	1992 R'000	Total 1991 R'000	CSIR 1991 R'000	FRD 1991 R'000
<b>Discontinuance of reserve accounting:</b>				
<b>Increase in the surplus for the year</b>	<b>15 573</b>	17 869	9 244	8 625
<b>Increase in income</b>				
<b>Income earmarked for the funding of assets</b>	<b>17 261</b>	23 454	14 001	9 453
● <b>Parliamentary grant</b>	<b>16 544</b>	20 061	10 659	9 402
● <b>Sundry income</b>	<b>717</b>	3 393	3 342	51
From contractors to finance equipment	<b>15</b>	198	147	51
Proceeds on disposal of fixed assets	<b>702</b>	3 195	3 195	-
<b>Increase in running expenses</b>				
<b>Net assets written off</b>	<b>1 688</b>	5 585	4 757	828
● <b>Cost</b>	<b>10 713</b>	13 424	12 596	828
● <b>Accumulated depreciation written back</b>	<b>9 025</b>	7 839	7 839	-
<b>Net surplus before change</b>	<b>7 095</b>	17 276	9 867	7 409
<b>Net surplus after change</b>	<b>22 668</b>	35 145	19 111	16 034

### Change in the basis of accrual for accumulated leave pay:

<b>General reserve opening balance reduced by</b>	-	11 800	11 800	-
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## 10. Assets written off

	1992 R'000	1991 R'000
<b>Cost</b>	<b>10 713</b>	12 596
Disposals – note 6	<b>10 573</b>	12 457
Relinquished – note 6	<b>140</b>	139
<b>Accumulated depreciation written back</b>	<b>9 025</b>	7 839
	<b>1 688</b>	4 757

## Notes to the Financial Statements (continued)

### 11. Decrease/(Increase) in working capital

	1992	1991
	R'000	R'000
Debtors and advances	6 059	818
Stock and contracts in progress	(3 436)	(7 748)
Advances received	(10 848)	3 606
Creditors and accrued expenses	3 275	7 121
	<b>(4 950)</b>	3 797

### 12. Cash utilised for the acquisition of fixed assets

	1992	1991
	R'000	R'000
Fixed assets acquired	27 957	41 136
Less: Assets of the South African Forestry Research Institute acquired for no consideration	-	6 155
	<b>27 957</b>	34 981

### 13. Funds transferred to the Foundation for Research Development

	1992	1991
	R'000	R'000
Cash reserves transferred	-	19 320
Funding the loss for the six months ended 30 September 1990	-	780
Funding capital expenditure for the six months ended 30 September 1990	-	606
	-	20 706

### 14. Turnover

	1992	1991
	R'000	R'000
Parliamentary grant	210 008	212 376
Contract income	194 680	179 495
Sundry income	13 756	7 663
Less: Proceeds on disposal of fixed assets	702	3 195
	<b>417 742</b>	396 339

### 15. Running expenditure

	1992	1991
	R'000	R'000
Running expenditure includes audit fees	944	669
- For current year	800	669
- Underprovision for previous year	144	-

## 16. Restatement of comparatives at 31 March 1991

### 16.1 Balance sheet

	Effect of the changes in accounting			Restated R'000
	As previously stated	policies (note 9)	Less attributable to FRD	
	R'000	R'000	R'000	
Capital account	551 125	(17 869)	104 630	428 626
General reserve	45 220	17 869		
		(11 800)	16 034	35 255
	596 345	(11 800)	120 664	463 881
Fixed assets	425 762	–	120 782	304 980
Investments	27 225	–	–	27 225
Debtors and advances	47 105	–	512	46 593
Stock and contracts in progress	23 483	–	655	22 828
Cash and short-term deposits	163 139	–	–	163 139
Advances received	(39 452)	–	(42)	(39 410)
Creditors and accrued expenses	(50 917)	(11 800)	(1 243)	(61 474)
	596 345	(11 800)	120 664	463 881

### 16.2 Income statement

	Effect of the changes in accounting			Restated R'000
	As previously stated	policies (note 9)	Less attributable to FRD	
	R'000	R'000	R'000	
<b>Income</b>	453 420	23 454	77 340	399 534
Parliamentary grant	266 726	20 061	74 411	212 376
Contract income	182 347	–	2 852	179 495
Sundry income	4 347	3 393	77	7 663
<b>Expenses</b>	462 469	5 585	66 083	401 971
Salaries	239 323	–	23 803	215 520
Depreciation	26 687	–	–	26 687
Running expenses	196 459	5 585	42 280	159 764
<b>(Deficit)/Surplus for the year before interest</b>	(9 049)	17 869	11 257	(2 437)
Interest	26 325	–	4 777	21 548
<b>Net surplus transferred to general reserves</b>	17 276	17 869	16 034	19 111

## Notes to the Financial Statements (continued)

### 16. Restatement of comparatives at 31 March 1991 (continued)

#### 16.3 Cash flow statement

	Effect of the		Less funds attributable to FRD	Restated
	As previously stated	changes in accounting policies (note 9)		
	R'000	R'000	R'000	R'000
<b>Cash received from external sources</b>	286 985	(212 523)	74 462	-
<b>Cash available from/(used in) operations</b>	(216 630)	224 343	(46 639)	54 352
<b>Cash generated by/(used in) operations</b>	(249 088)	224 343	(53 752)	29 007
(Deficit)/Surplus before interest income	(9 049)	17 869	11 257	(2 437)
Parliamentary grant	(266 726)	201 717	(65 009)	-
Adjusted for assets written off - note 9	-	4 757	-	4 757
Adjusted for depreciation	26 687	-	-	26 687
<b>Cash (utilised)/generated by an (increase)/ decrease in working capital</b>	6 133	-	2 336	3 797
<b>Cash generated from interest income</b>	26 325	-	4 777	21 548
<b>Cash invested to maintain operations</b>	43 140	3 195	11 354	34 981
Fixed assets acquired	46 335	-	11 854	34 981
Less: Proceeds on disposal of fixed assets	3 195	(3 195)	-	-
<b>Cash generated</b>	27 215	8 625	16 469	19 371
Decrease in the loan to the National Facilities	-	8 625	17 914	(9 289)
Funds transferred to the Foundation for Research Development - note 13	19 320	-	(1 386)	20 706
Increase in cash and short-term deposits	7 895	-	(59)	7 954
<b>Cash utilised</b>	27 215	8 625	16 469	19 371

#### 16.4 Fixed assets

	Less		Restated
	As previously stated	attributable to FRD	
	R'000	R'000	R'000
<b>Cost</b>			
<b>Opening balance</b>	<b>516 637</b>	<b>119 134</b>	<b>397 503</b>
Additions	52 490	11 354	41 136
Disposals	13 285	828	12 457
Relinquished			
• To the Foundation for Research Development	8 878	8 878	
• Other	139	-	139
<b>Closing balance</b>	<b>546 825</b>	<b>120 782</b>	<b>426 043</b>
<b>Accumulated depreciation</b>	<b>121 063</b>	<b>-</b>	<b>121 063</b>
<b>Book value</b>	<b>425 762</b>	<b>120 782</b>	<b>304 980</b>

