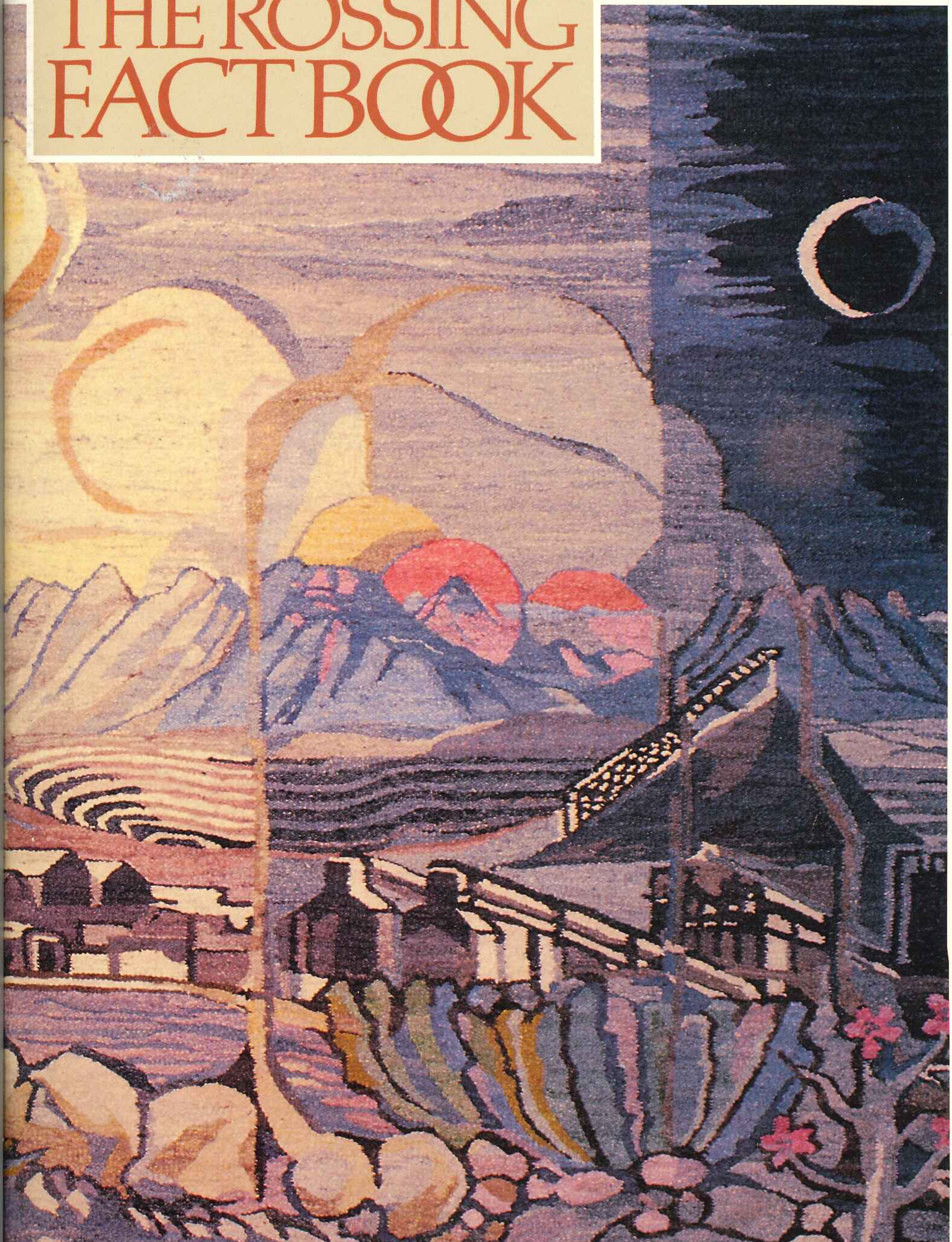
THE RÖSSING FACT BOOK



INTRODUCTION

Namibia is a large, sparsely populated country in south-western Africa, with an area of more than 800 000 square kilometres and a population of a little more than 1 million. It lies between the Kunene River to the north, the Orange River to the south, the Atlantic Ocean to the west and Botswana to the east. The Kalahari Desert straddles the border with Botswana and the Namib Desert runs the entire 1300 kilometre length of the coast, varying in width from 80 to 120 kilometres. It is in the Namib, 65 kilometres north-east of the seaside town of Swakopmund, that the Rössing orebody lies.

Construction of workshops and plant for the opencast mine at Rössing began in July 1974, and the first production of uranium oxide commenced two years later. Many severe problems had to be overcome during those two years and in the two years which followed, both in the technical area and in the field of human resources. The abrasive properties of the rock being mined and the discovery of design and engineering faults impaired plant efficiency; the low educational opportunity in Namibia and the lack of industrial experience among Namibians meant that most of the mine's workforce had to be trained from an elementary level before they could work productively. Today Rössing is a technologically advanced operation and its employees display a considerable range of skills.

Furthermore, homes and amenities had to be provided in the desert for employees and their families. The town of Swakopmund was expanded to accommodate senior staff, while for less senior employees a new town – Arandis – had to be created on a sandy plain 12 kilometres from the mine.

Out of these many difficulties, and in a surprisingly short time, the ideas behind Rössing triumphed, and one of the largest uranium mines in the world became a reality. The success was based on co-operation between investors who provided the risk capital for the venture and who were prepared to wait for a return on their investment; the employees – many from pastoral backgrounds – who had to come to terms with modern industry on a scale unknown to Namibia; the management of Rössing who had to take the blows of the early years and keep rising to the challenges; and the customers who had to accept delays in deliveries while the mine's problems were being overcome.

Mining, agriculture and fishing have been traditionally the three pillars of the Namibian economy. In recent years the effects of drought and of apparently dwindling fish resources have placed increasing importance on mining and on Rössing's contribution. Apart from being a major taxpayer, the company spends about R120 million inside Namibia each year, almost half on wages, salaries and other employee related costs, and the rest on the purchase of goods and services.

The extensive training programmes conducted by Rössing have added greatly to the pool of skilled labour available in Namibia; and the mine's need for specialized supplies and services – from catering to engineering – has had a ripple effect, benefitting the country as a whole.

Rössing's social contribution has also been important to Namibia. Steadfastly opposed to racial discrimination in the workplace and in the community as a whole, Rössing's practical example is followed by those organizations and people who wish to be part of the emergent Namibia. Recognizing that better education must be provided and developed throughout the country if Namibians are to improve the quality of their life, the company established the Rössing Foundation in 1978, to concentrate on providing adult education to a wide cross-section of Namibians on a national basis.

Rössing Uranium Limited is a young company whose first years proved to be a period of great adversity. The company has now shown itself to be efficient, flexible and enlightened – qualities which it will continue to deploy during Namibia's transition to independence and nationhood.

Cover: 'Rössing in the Namib', a tapestry designed by Christine Marais and made in Namibia by Jenny Carvill, Johannes Auchab and Ananias Andimba.

1. *Dust on haulroads is suppressed by spraying water.*

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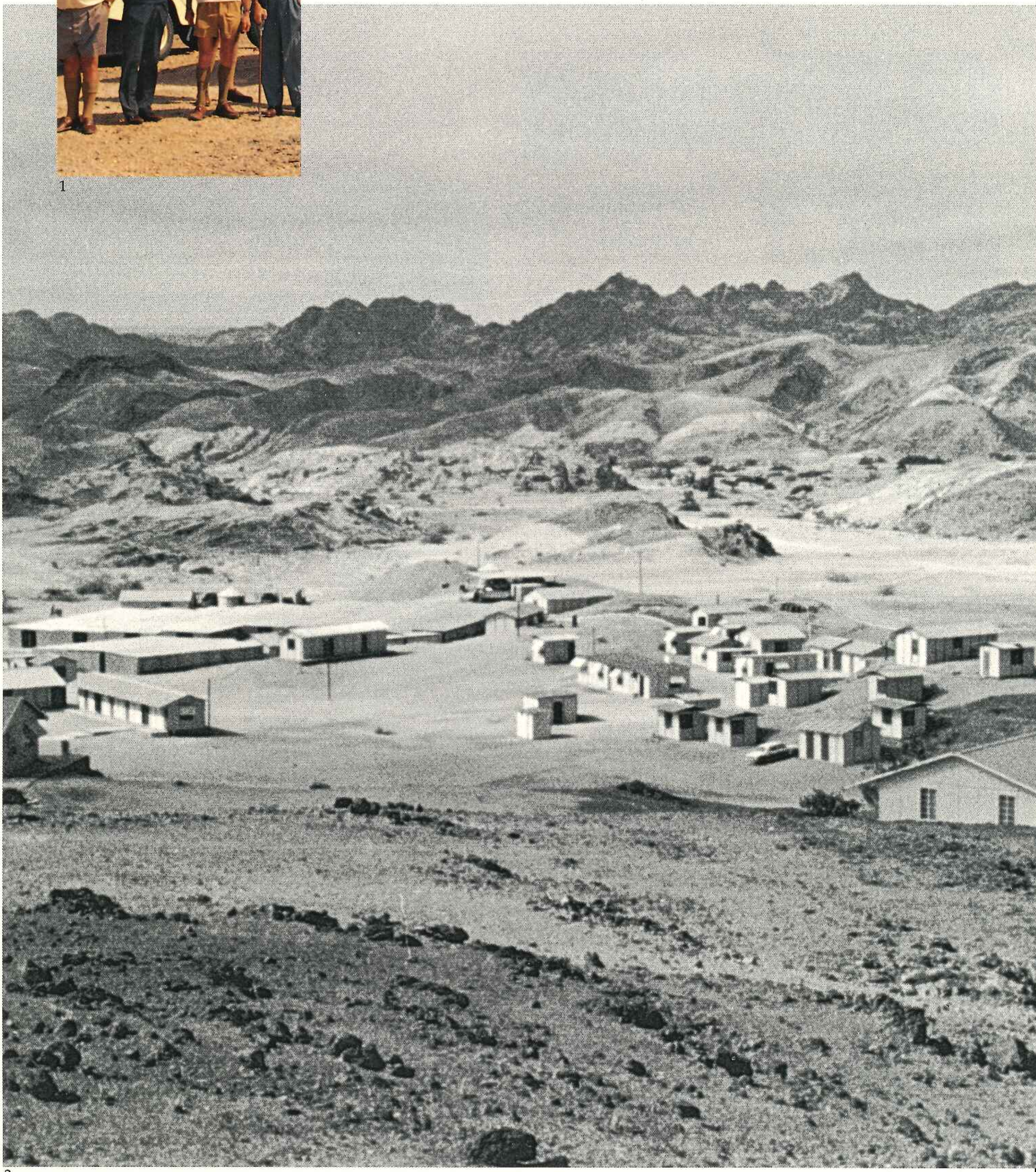
CONTENTS

Rössing

1

THE MAKING OF A MINE



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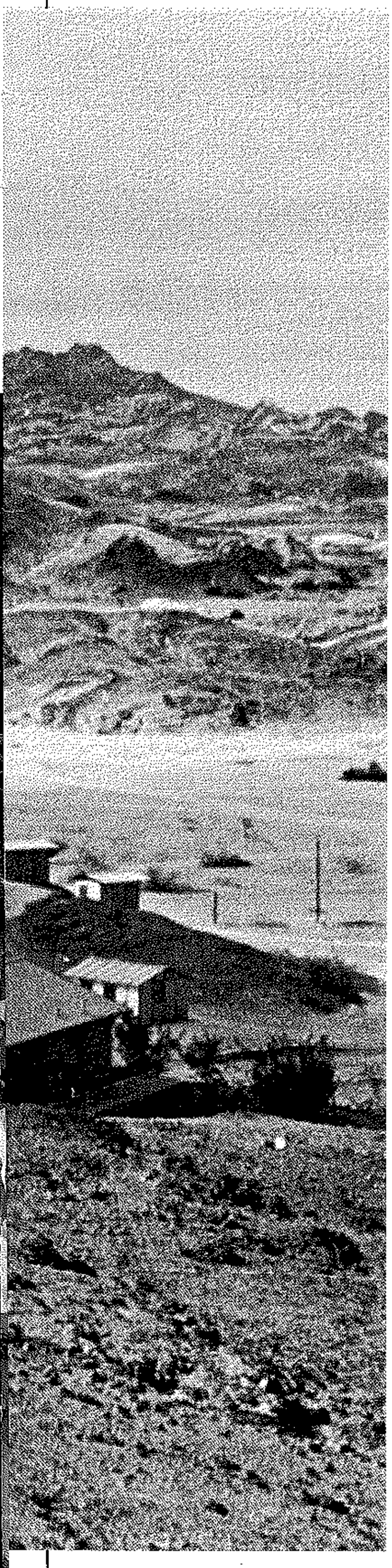
1. *The late Capt Peter Louw (far right) on a visit to the Rössing site. John Berning is at far left.*
2. *The exploration camp eventually grew into a full village.*
3. *The late Capt Peter Louw at the entrance to an adit excavated in 1956.*



In 1966 John Berning, exploration manager of Rio Tinto Management Services South Africa (Pty) Limited – a subsidiary of the Rio Tinto Zinc Corporation (RTZ) – negotiated an option of six years' duration on the 1 000 sq km concession held by G P Louw (Pty) Limited, when Rössing was just a pin on the map. It was a very small team which then came to the Namib Desert to carry out initial reconnaissance and survey work.

Airborne and ground radiometric surveys and geological mapping narrowed the area of search. Gradually, the tempo of exploration work quickened. Diamond drills arrived to probe the rock at depth in pre-determined locations, so that a 'picture' of the ore-body could be built up. A shaft was excavated to recover material in bulk so that the metallurgists could determine how the ore could best be treated. A pilot plant was built to establish whether the proposed extraction process could indeed produce uranium oxide from the ore at a marketable price.

During the pilot plant stage there were about 90 employees on site.

Meanwhile, moves were afoot to arrange capital finance for the establishment of a mine, which, it was realised, would be a large undertaking even by the standards of the 1970s.

Contracts were negotiated for supplies of uranium from Rössing, to generate electricity in industrialized countries.

A comprehensive feasibility study, completed by May 1973, embraced the preliminary mining plan, plant design and infrastructural requirements, providing estimates of all capital and operating costs. The decision to go ahead with the project was made in August 1973. Detailed engineering of the plant was to be undertaken by a partnership of Western Knapp (USA) and Davy Power Gas (UK) who had been jointly appointed as principal design and construction managers in 1971. Skilled labour, materials and equipment came mainly from the United States and South Africa.

Other contracts were awarded for mine service facilities, initial site preparation, the building of construction camps, road, rail and air links and power supply. Fortunately an existing main road and a railway line passed within 12 kilometres of the new mine.

In July 1974, construction started with the pouring of concrete for the large mine workshops. During the next two years, construction teams poured 30 000 cubic metres of concrete, erected 2 200 tonnes of steel plate and installed 15 000 tonnes of mechanical equipment in an isolated spot in the desert, bringing Rössing Uranium Mine into existence.

The mine and plant – designed to produce 5 000 short tons of uranium oxide per year – began operating in March 1976, but serious setbacks arose from the nature of the ore. Rössing's metallurgists and engineers were confronted with many operating difficulties caused by the abrasive properties of the granitic rock containing the uranium minerals. Tremendous wear and tear – in pipelines and machinery – were the main manifestations. Moreover, a number of design and engineering faults impaired the overall extraction efficiency of the plant.

By mid-1976, the Rössing team, with the help of consultants, had identified the major problem areas and formulated solutions. A series of major alterations and additions to the plant, costing R100 million, was put in hand. This entailed an ambitious construction and modification programme which was carried out while the plant remained in production.

In 1978, when the modifications were nearing completion, a major fire in one of the two solvent extraction units resulted in considerable damage and caused a further production bottleneck. Nonetheless, the entire modification programme was completed on schedule and within budget, and the section of the plant destroyed by fire was rebuilt with design improvements.

Prior to full commercial production in 1978 some rescheduling of product deliveries was necessary. This was achieved with the co-operation and understanding of the company's customers.

MINING OPERATIONS

1. Operations at Rössing continue throughout the night.
2. A load of ore being checked by scanner.
3. The open pit at Rössing.
4. A haultruck being loaded with ore in the open pit.

The scale of the mining operation at Rössing in full production can be illustrated by the fact that the equivalent of a 100-truck groods train loaded with rock leaves the open pit every 20 minutes, 24 hours a day, 365 days a year.

Large electric rotary drills prepare a predetermined pattern of blastholes 380 millimetres in diameter and 18 metres deep. Each of the blastholes is charged with approximately 1 600kg of ammonium nitrate-based explosive. A total of about 300 tonnes of explosive is used each week.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The pit is mined in 15 metre-deep benches. After each blast, electric shovels load the broken rock into 150 tonne haultrucks which deliver the uranium bearing ore to the primary crushers and waste material to discard dumps outside the pit area. The uranium in the ore is very erratically distributed which requires carefully planned blending of ore from several locations in the pit in order to give a consistent feed to the mills. Shovels are allocated to ore and waste mining in order to deliver the required ore blend to the primary crushers and at the same time to achieve the necessary stripping of waste to expose further ore.


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5. *Electric rotary drills prepare a predetermined pattern of blastholes.*
6. *Meticulous mine planning is carried out.*
7. *Blasting breaks and loosens the hard rock.*

The shovel operators and the haultruck drivers are in radio contact with controllers who overlook the entire pit. Their job is to direct the haultrucks to a particular shovel according to a predetermined plan based on analytical data and verified by scintillometer readings. The loaded trucks are then sent either to the waste dumps or to the primary crusher.

As in all open-cast operations, the strategy for developing the pit is based on an overall mining plan drawn up for the anticipated life of the mine. This plan is modified from time to time in the light of further geological knowledge of the grade of ore which can be mined and treated.

Rössing has developed sophisticated mine planning and grade control procedures which use computer graphics to optimise the mining operation. In order to develop the best long-term design for the open pit, geotechnical studies on the stability of the pit walls are undertaken continuously.

The average slope of the pit sides is 45°; the eventual area of the pit will be over 5 sq km and the depth more than 300 m.

Studies are constantly being carried out at Rössing to determine such matters as drilling patterns for optimum fragmentation, the best construction materials to resist the severely abrasive nature of the ore, and to improve maintenance procedures for equipment.

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GEOLOGY OF THE URANIUM DEPOSIT

The Rössing orebody is unique in that it is the largest known deposit of uranium occurring in granite.

Most of the other major uranium deposits of the world, such as those in South Africa, Canada, the USA and Australia, occur in sedimentary formations.

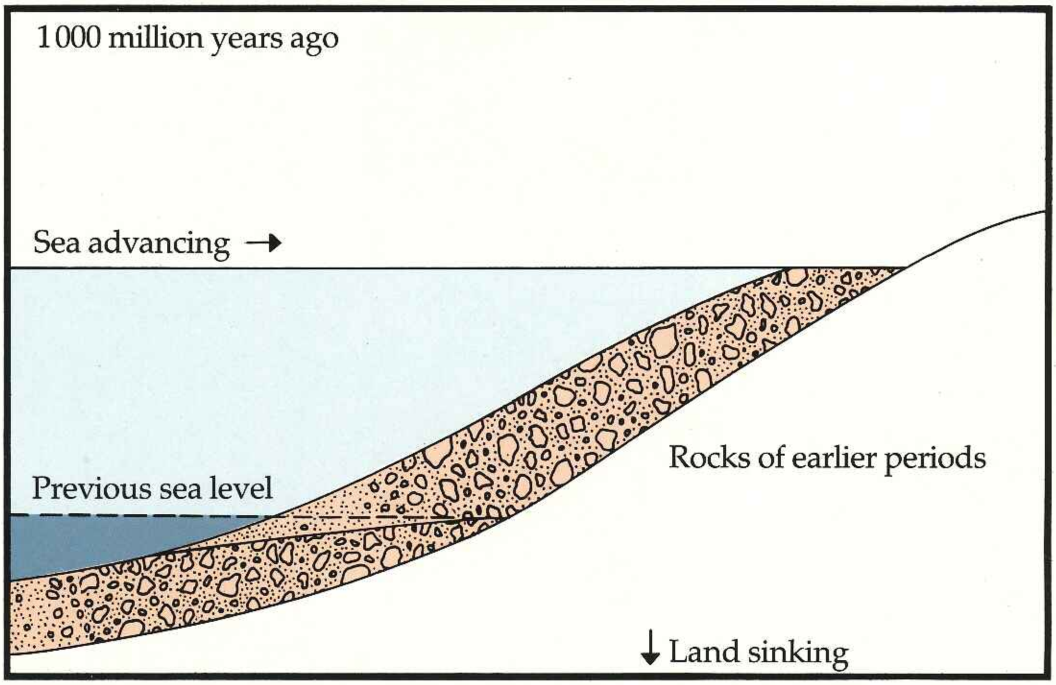
On surface the Rössing ore-zone has an arrowhead-like outline, pointing towards the south-east, and is approximately three kilometres long and one kilometre wide. There is evidence from diamond drilling that the ore-zone pitches downward in the direction of the crude arrow-head.

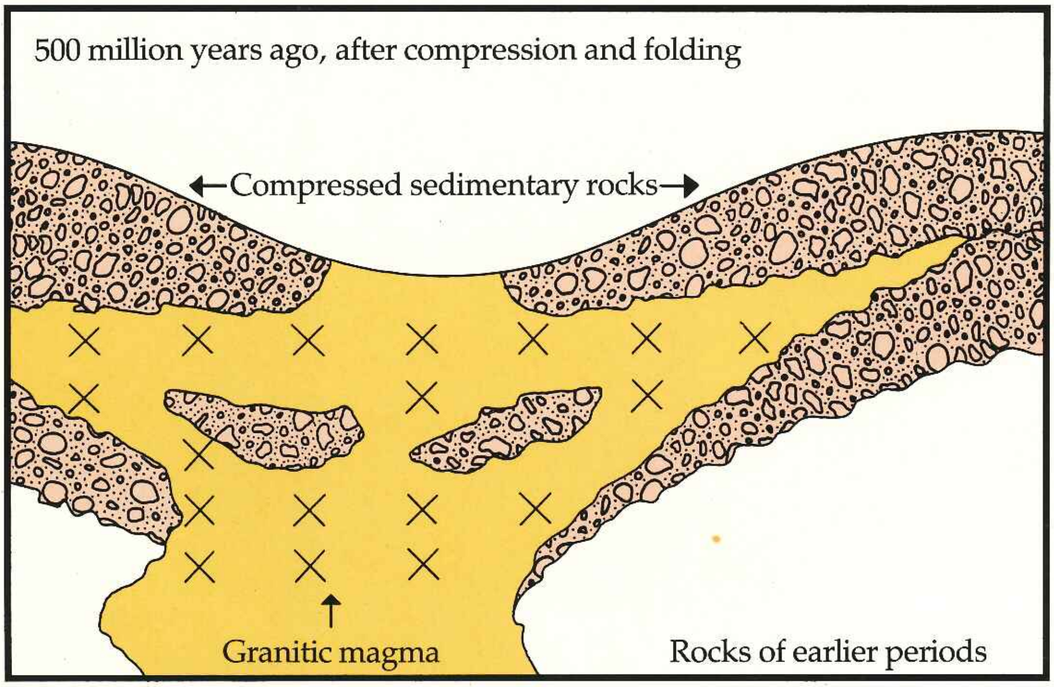
Some 1 000 million years ago, in the late Pre-Cambrian period, sediments of the Damara Group were deposited in a sea which extended in a north – easterly direction across south-central Africa. In the shallow waters along the shores of this sea, coarse sand-stones were formed followed by siltstones, graywackes and marls in slightly deeper water. This is known as the Khan Formation. In still deeper water, where more stable conditions prevailed, finer sediments such as shale and limestone were deposited to form what is known as the Rössing Formation. As the shoreline advanced on to the land the finer sediments of the Rössing Formation were deposited on top of the coarser, older sediments of the Khan Formation.

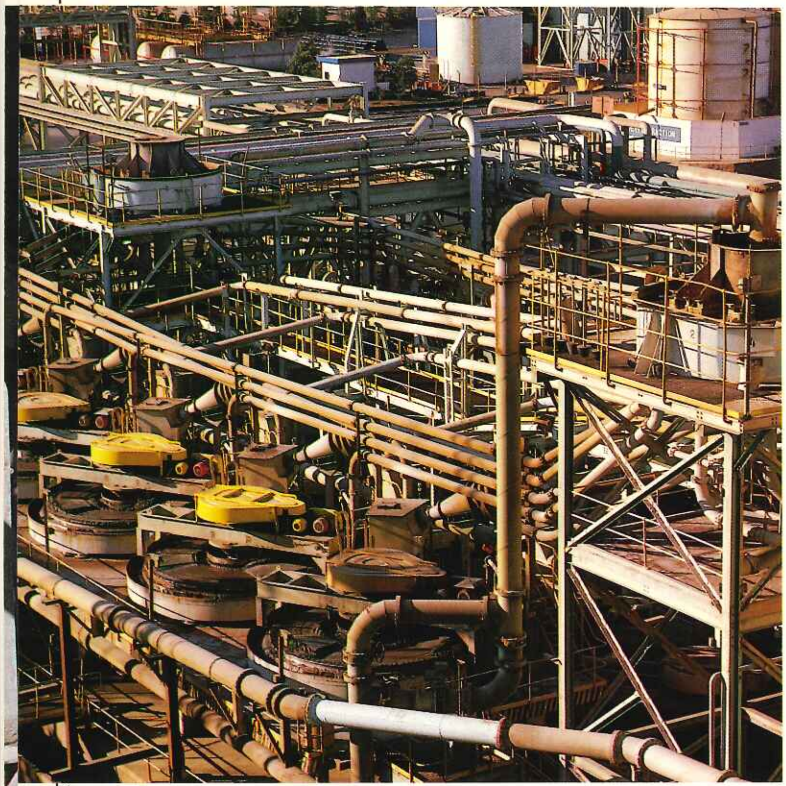
Then, about 500 million years ago, the thick pile of sediments which had accumulated began sinking to great depths in the earth's crust. This resulted in the development of stresses which caused complex folding of the formations. The high temperatures and pressures prevailing at these depths altered the rocks extensively; the rocks of the Khan Formation were changed to gneiss, schist and amphibolite and those of the Rössing Formation to marble, gneiss and quartzite.

While this was taking place, granitic magma began moving upwards through the folded rocks of the Damara Group.

Along the contact between the Khan and Rössing Formations, the magma intruded as pegmatitic granite, known as alaskite, in the form of narrow dykes, or large irregular bodies that cut across and in places engulfed the other rocks. This pegmatitic granite or alaskite contains the uranium minerals, uraninite and beta-uranophane, whereas the sediments are low in uranium content.







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METALLURGICAL OPERATIONS

The next step in the process is to reduce the mined ore to a size small enough for the uranium minerals to be exposed to leaching reagents; this is effected in four stages of crushing and one stage of wet grinding. Two primary gyratory crushers reduce the ore from the 'as mined' size to less than 160 mm. This primary crusher product is then conveyed to a coarse ore stockpile which has a live storage capacity of some 70 000 tonnes. Ore is reclaimed from this stockpile by vibrating feeders situated in a tunnel underneath the pile and is delivered on to a conveyor which transports the ore to the fine crushing plant.

In the fine crushing plant the ore is reduced by secondary, tertiary and quaternary crushers to less than 19 mm. This material is stored in a fine ore stockpile ahead of the rod mills. The crushing plant is capable of a throughput rate of 2 500 tonnes per hour.

The final stage of size reduction employs four rod mills. The crushed ore is withdrawn from the stockpile by conveyors to the mills where water is added to make a pulp. Grinding is effected by cascading steel rods within the rotating mill. The rods are themselves gradually worn down by this action and are replenished daily.

The resulting slurry is pumped to the leaching section where it is mixed with sulphuric acid, ferric sulphate and manganese dioxide in a series of six leach tanks. The pulp is kept in suspension by large mechanical stirrers and the leaching process extracts approximately 90% of the uranium from the rock particles in solution.

Having extracted the uranium into sulphuric acid solution, it is then necessary to separate that solution from the waste solids, and to wash out any entrained uranium-bearing solution from the solids. The first step is to separate the relatively coarse sand particles from the fine slime. This operation is carried out by hydrocyclones. The overflow from the hydrocyclones contains the fine solids (or slimes) and most of the uranium-containing solution. The underflow contains the coarse sand particles.

The uranium is washed out of the slime in five stages of counter-current decantation thickeners in which the solids settle to the bottom, and clear liquid, known as pregnant solution, overflows from the periphery of the thickener and goes forward to the next process stage, ion exchange.

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1. *The sands are washed in rotoscoops.*
2. *Operators check samples in the ion exchange plant.*
3. *A drum of uranium oxide is removed from the final product plant.*
4. *The crushed ore is ground to a pulp in the rodmills.*
5. *A central computer controls the metallurgical plant.*
6. *The coarse ore stockpile.*

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The final thickener underflow from the fifth stage rejoins the sands product for disposal.

The coarse sands are washed in a two-stage process with the solution from each being fed to the thickeners. Sands washing is carried out on rotoscoops in which settled sand is lifted out of the solution by a rotating table fitted with a plough. The final washed sand is conveyed to the tailings section where it is recombined with the slimes and pumped away to the tailings dam.

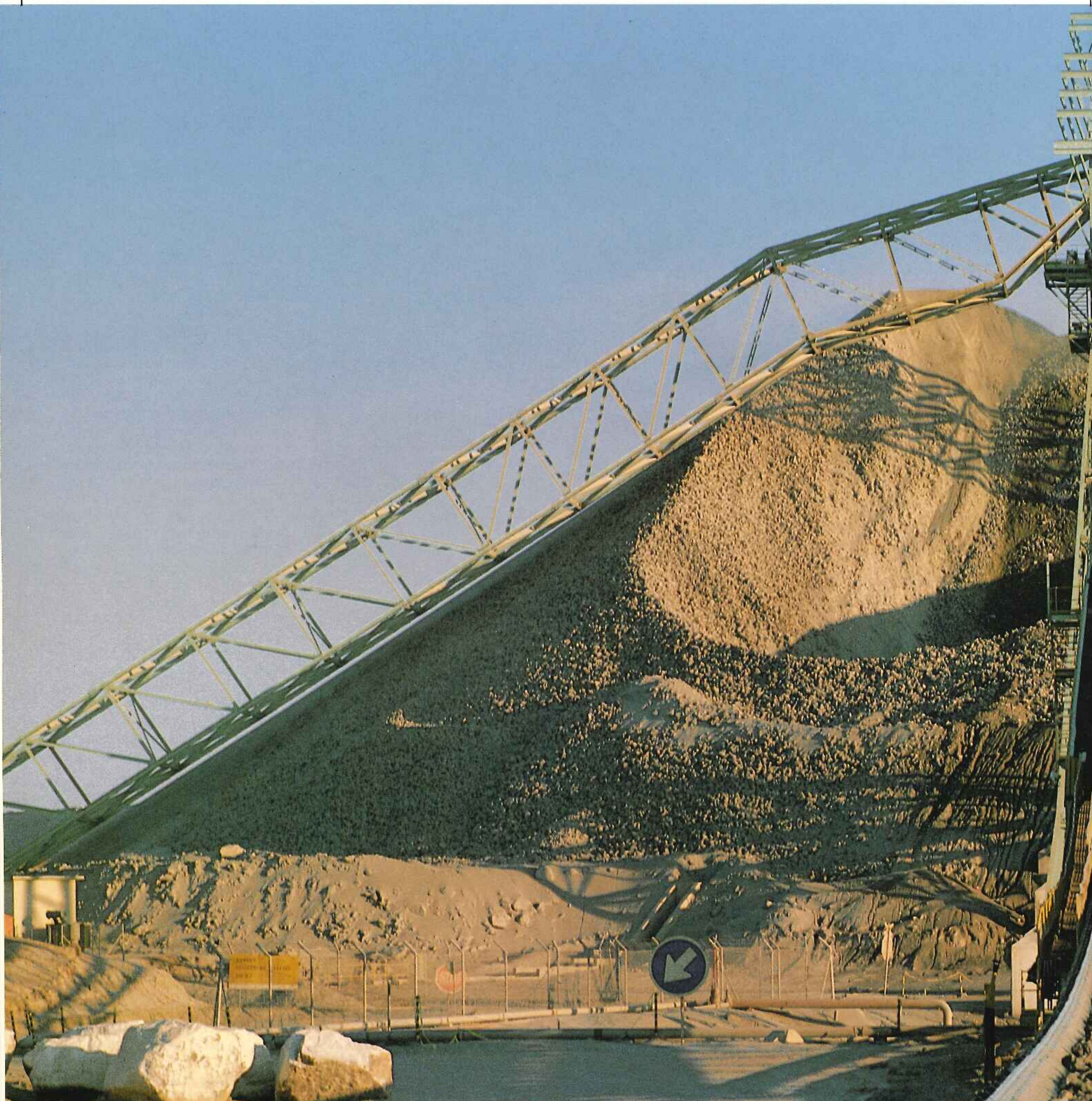
Tailings disposal is a vital step in any mining operation and at Rössing nearly 80 000 m^3/day of pulp, containing over 40 000 tonnes/day of solids, are pumped through 450 mm diameter pipeline systems to the tailing disposal area. This area is a valley, across the mouth of which a dam has been built with tailings, behind which the fine tailings and water are stored. Water is recovered from the tailings dam for re-use in parts of the plant; in this way fresh water usage at the mine is reduced by almost 50%.

In the leaching and washing circuits uranium has been transformed from the solid state into solution in sulphuric acid. This solution is fed to the counter-current ion exchange plant where the uranium is transferred from solution on to resin beads as a uranium compound, and then back into solution at a much greater concentration.

The next process is solvent extraction, where the chemistry is rather similar to that of ion exchange but the carrier, instead of being resin beads, is in this case a liquid organic compound. Again the process is in two stages: in the first stage the uranium is extracted out of the aqueous solution into the organic phase and the two liquids are separated by settling. The organic liquid, which is now loaded with uranium, is fed into the stripping section where the pH of the solution is raised by the addition of ammonia; under these conditions the uranium is taken back into aqueous solution at a higher concentration and in a purified form because the chemistry of the process is almost totally selective to uranium.

The final steps in the process consist of the precipitation of ammonium diuranate or yellowcake, by the addition of further ammonia. The yellowcake is then thickened, washed, filtered, and finally heated in a six hearth roaster to produce uranium oxide (U_3O_8). This contains about 98% U_3O_8. After sampling, the oxide is packed in steel drums for despatch to overseas customers.

An accurate knowledge of the uranium content and impurities content of many materials arising throughout the process is vital to efficiency and particularly to product quality. The

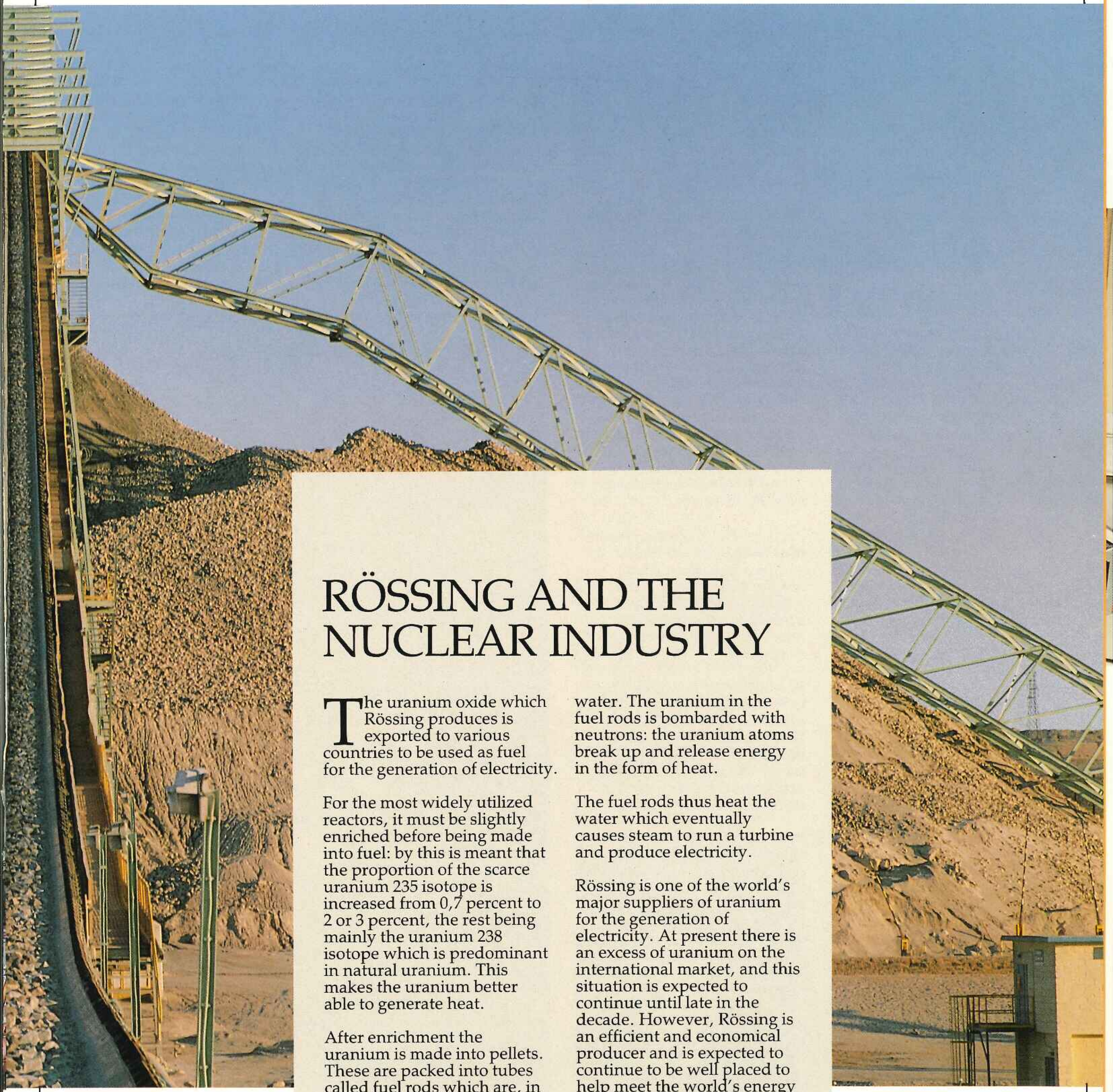


analytical laboratory provides a service in this respect and handles over 25 000 samples per month, carrying out some 36 000 determinations. A wide range of modern analytical techniques is used including X-ray fluorescence, spectroscopy, atomic absorbtion and radiometric techniques.

A recent innovation in the metallurgical plant has been the installation of a R2m centralised computer control system, to replace the existing ten separate control rooms. The entire metallurgical operation is now controlled from one location. This has resulted in improved control of various operations and increased efficiencies.

The major consumable item in the extraction process is sulphuric acid required for the leaching process. Rössing's own acid plant, based on roasting of pyrite, produces the mine's total requirement.

Because of the isolated position of the Rössing operation, its maintenance and engineering services have to be virtually self-sufficient. The mine is capable of carrying out maintenance tasks that range from light vehicle servicing to the overhauling of heavy equipment.



RÖSSING AND THE NUCLEAR INDUSTRY

The uranium oxide which Rössing produces is exported to various countries to be used as fuel for the generation of electricity.

For the most widely utilized reactors, it must be slightly enriched before being made into fuel: by this is meant that the proportion of the scarce uranium 235 isotope is increased from 0,7 percent to 2 or 3 percent, the rest being mainly the uranium 238 isotope which is predominant in natural uranium. This makes the uranium better able to generate heat.

After enrichment the uranium is made into pellets. These are packed into tubes called fuel rods which are, in turn, placed in the core of a nuclear reactor, immersed in water. The uranium in the fuel rods is bombarded with neutrons: the uranium atoms break up and release energy in the form of heat.

The fuel rods thus heat the water which eventually causes steam to run a turbine and produce electricity.

Rössing is one of the world's major suppliers of uranium for the generation of electricity. At present there is an excess of uranium on the international market, and this situation is expected to continue until late in the decade. However, Rössing is an efficient and economical producer and is expected to continue to be well placed to help meet the world's energy needs in the 1990s and beyond.

RÖSSING AND THE ENVIRONMENT

All human activity has an impact on the environment and mining is no exception. However the benefits to mankind in releasing useful and valuable minerals from the earth greatly outweigh any negative environmental impact, provided this impact is kept to a minimum. In order to achieve this, Rössing created an Environmental Control and Water Management Department which monitors and controls all forms of environmental impact and occupational hygiene.

RADIATION
What is radiation? All material is made up of elements and the basic unit of any element is the atom. At the centre of every atom is a nucleus which is made up of positively charged particles (protons) and others with no charge (neutrons). Around this nucleus a number of negatively charged particles (electrons) travel in orbits.

Atoms of some elements such as uranium are unstable because there is an imbalance of protons and neutrons in the nucleus. They emit particles and energy and in the process change into atoms of other elements. This emission is called radiation. Different atoms emit different types of radiation such as alpha, beta and gamma or X-ray emissions, with varying degrees of penetration. Natural uranium is mainly an alpha emitter. The very small amount of beta and gamma radiation at Rössing pose no environmental problems. Alpha radiation cannot penetrate more than six centimetres of air; it can also be stopped completely by any solid object, for example a sheet of paper. However, alpha-emitting materials can be hazardous to health if they come into contact with internal tissues, through being inhaled or swallowed, causing internal radiation.

The ore from Rössing mine is of a low grade, ie. it contains little uranium and thus emits little radiation. The external radiation hazard in the pit is thus small, and emphasis is placed on preventing internal radiation through ingestion. The part of the operation where the greatest concentration of uranium occurs is the final product area, where the substance is roasted and packed. This area is kept very clean, so that there is virtually no trace of dust in the air. In fact radiation levels in Rössing's final product area are as low as those in the best of similar plants elsewhere. However, as an additional precaution, employees who enter this area wear overalls, boots, gloves, safety helmets, safety glasses and respirators. Before leaving the area they discard their working clothes, shower, change into their own clothes and pass through an electronic monitor which determines whether they are clean.

All workers in the area wear film badges which record external radiation. Each employee regularly provides a urine sample which is analysed for uranium as a check for possible internal exposure.

No employee at Rössing has ever exhibited sickness due to exposure to radiation, and because Rössing applies the best possible health and safety standards, no health problems are anticipated in future.

It is important to understand that radiation is a natural part of the human environment. Our greatest sources of daily external radiation exposure are the sun and the soil. Stone and brick houses, medical X-rays and foods are also common sources of radiation.

Radiation doses to humans are measured in Sieverts. A Sievert is a unit which takes into account the amount of radiation and its effects on human tissue. A milliSievert is 1/1 000 of a Sievert.

To put radiation in perspective one should consider the fact that residents of the Namibian capital of Windhoek are exposed to about 2,5 milliSieverts a year from the sun and earth as background radiation. The average production worker at Rössing is exposed to only an additional 1,4 milliSieverts of external radiation a year as a result of his work. The internationally recommended limit for additional radiation exposure of employees in the nuclear industry is 50 milliSieverts per year.

DUST
Visible dust can be a nuisance but it is not necessarily a health hazard. This is because large dust particles cannot reach the lungs. It is the very fine dust, invisible to the naked eye and called the 'respirable fraction', which can cause lung problems. When this dust contains large quantities of silica, inhalation of fine particles over several years can cause a lung disease called silicosis.

The dust at Rössing mine is relatively low in silica. Nevertheless, great care is

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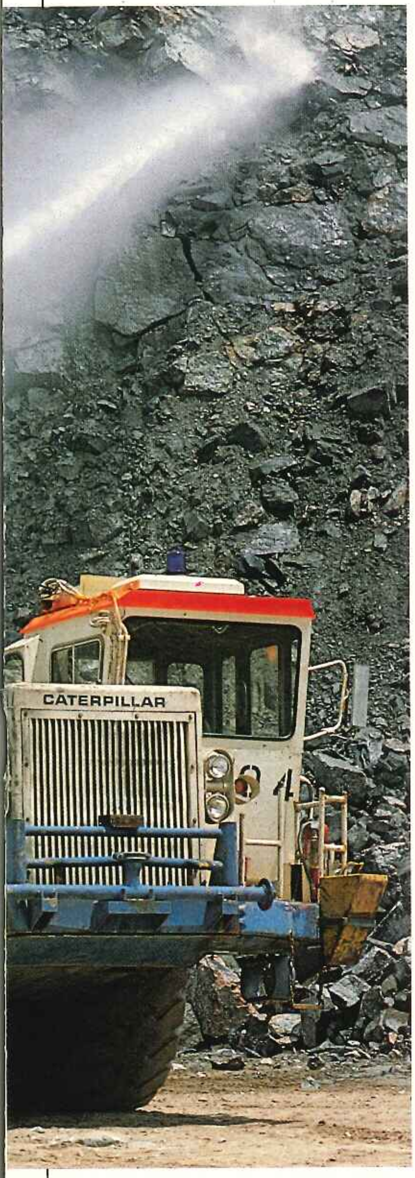
taken to prevent workers from inhaling it. Two kinds of precautions are taken:

- Various engineering techniques are used to prevent dust from arising or to contain it;
- Where dust cannot be prevented or contained, people working in dusty areas are properly protected.

At Rössing, water is used to suppress dust in the open pit and at various crushing stages. Brackish water, which percolates through the rocks and collects at the bottom of the pit, and also treated waste water, are used for this purpose.

In the pit, jets of water are directed on to the blasted rock before loading by electric shovels into haultrucks commences. Water tankers patrol the roads in the pit, spraying them continually to prevent dust from being thrown up by haultrucks.



Only wet drilling is permitted in the pit as dry drilling would generate unacceptable dust levels.

At the primary crushers, when the haultrucks tip their loads, sprays of water suppress the dust. Sprays are used, too, at the further crushing stages. In addition to suppression by water, collection of dust by suction takes place at several points in the crushing process.

Most people who work in the open pit are operators of mobile equipment such as drills, shovels and haultrucks. The cabs of these machines are all airconditioned, with efficient dust filters. The few people who have tasks to do from time to time in dusty areas and who are not inside airconditioned cabs, must wear respirators, or 'Airstream' helmets.

As part of its environmental programme Rössing uses a mathematical model to study air dispersion, mainly of dust, in the vicinity of the mine. Although this study is not yet complete, preliminary measurements show that an environmental problem is most unlikely. Independent scientists are also carrying out an ecological survey in the area.

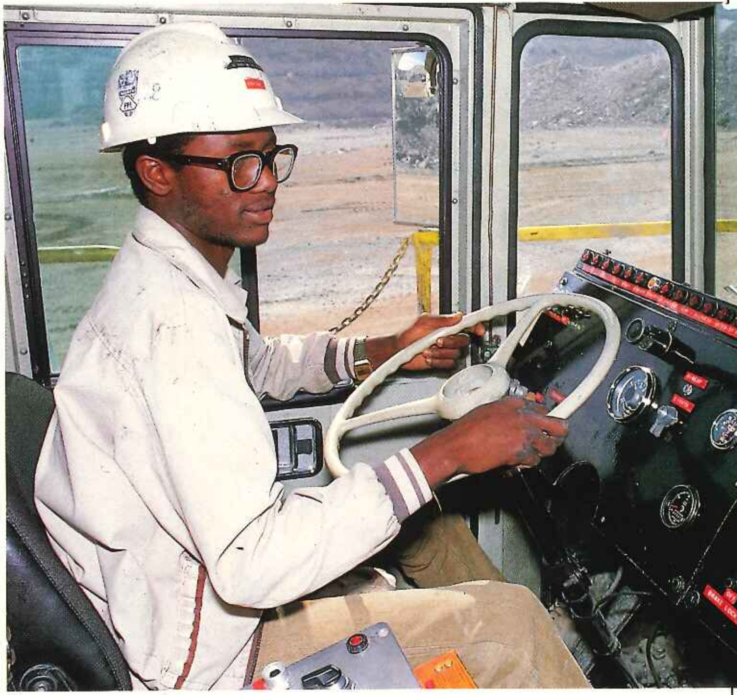
At Rössing's occupational health centre at the mine, regular checks are routinely carried out on employees, and include computerised lung function tests.

NOISE

Noise is a worldwide problem and if people are not protected from it they can eventually suffer hearing loss. Excessive noise can also have other effects such as producing a feeling of fatigue or irritation, or causing high blood pressure.

Common recreational causes of hearing problems include listening to the hi-fi with the volume turned up too high and target shooting or motorcycle scrambling without ear protection.

Noise is also a common industrial problem. Noise levels often accepted by people at home are not acceptable at Rössing mine,



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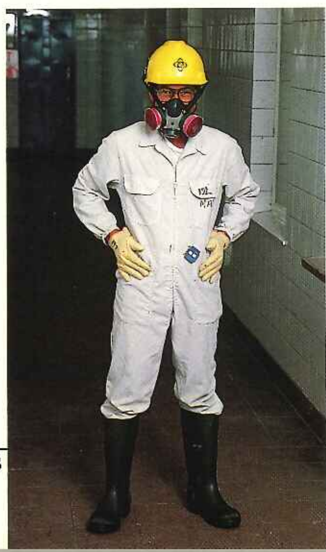
which sets its noise limit at – without ear protection – 85 decibels.

There are various locations at the mine, such as workshops, where employees must wear hearing protection, and Rössing supplies them with earmuffs or earplugs. Where it is feasible, Rössing uses engineering methods to reduce noise. An example is the replacement of jackhammers with rock drills operated from inside cabs.

GASES

Gases and fumes that occur in particular sections of the plant or workshops at Rössing are mainly sulphur dioxide, welding gases and exhaust fumes. Rössing's environmental staff monitor the concentrations of these gases and recommend appropriate steps to remove any hazard.

Equipment can be modified to eliminate or reduce the escape of gases, and/or employees can be issued with and required to wear respirators.



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Environmental and medical staff evaluate chemicals to pinpoint potential hazards such as gases.

Radon is a naturally occurring radioactive gas which is associated with uranium. Mining and other activities which disturb the soil release radon into the atmosphere.

In underground mining special ventilation techniques are used to prevent radon from becoming a hazard to the miners. At Rössing's opencast mine the low concentration of radon which is released during blasting is rapidly diluted and is therefore no hazard to the miners or the environment. Nevertheless, Rössing includes careful monitoring of radon in its environmental controls.

1. *A water cannon is used to soak blasted ore before loading starts.*
2. *A haultruck driver in his airconditioned cab.*
3. *A Rössing employee in the final product area, wearing safety clothing which includes a dust respirator and a film badge.*
4. *An employee passes through the radiation monitor at the exit from the final product area, to ensure that he is clean before going home.*
5. *An environmental officer checking the gas level in a tank before maintenance workers are allowed to enter it.*
6. *Environmental officers seen at Rössing's water recycling dam.*

WATER MANAGEMENT

The use of water is essential to Rössing's mining and milling processes. It plays a major part in the extraction process and is a carrier for the ore as it is processed through various parts of the plant, and for the solid waste as it is pumped to the tailings dam for disposal.

The supply of water to Rössing is handled by the Department of Water Affairs of Namibia, and the supply to the mine is part of the Central Namib State Water Scheme.

Under this scheme, water is pumped from the sands in the deltas of the Omaruru and Kuiseb Rivers to collecting stations and from there to reservoirs at Swakopmund. Water is distributed from there to the town of Swakopmund and to Rössing mine, via a pipeline and a series of pumping stations.

There are two aspects of water management to which Rössing pays particular attention – conserving water by means of economy and recycling, and controlling seepage from the tailings dam to minimise its infiltration into the natural groundwater in the vicinity of the mine.

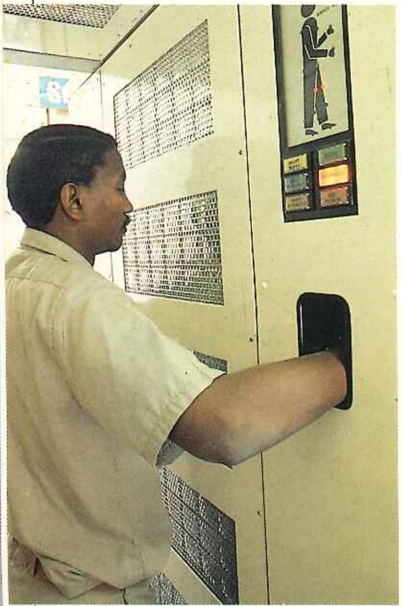
Since Rössing mine reached full production for the first time in 1979, use of fresh water has reduced steadily, due to improved methods of economy and by the progressive introduction of recycling. Currently almost half the water used by Rössing is recycled. In fact, Rössing uses less water per unit of ore processed than most mines in the world. Recycled water is used in the rodmills where the crushed ore is ground to a paste. It is also used for dust suppression and for flushing of plant. Capital costs of the water recycling programme have exceeded R4 million.

Various waste products are present in the tailings which are pumped to a dam on the mine property for storage after the uranium has been extracted. These include acid, dissolved salts and certain radioactive elements. Water in an earth dam naturally seeps into the surrounding soil. In the case of the tailings dam the acid and all the radioactive elements are captured by the soil immediately beneath, beside and in the earth dam, and remain there. The water which seeps out moves slowly through fractured rock formations on the mine property, carrying with it dissolved salts such as nitrates and sulphates.

The rock formations carry the water along identified routes towards the Khan River, which has no permanent surface flow but which has a significant underground flow of salty water. Before the seepage from Rössing leaves the mine property it is stopped by a series of trenches and wells – and pumped back for re-use. Any small amount of water which escapes capture and reaches the Khan River makes so slight an impact on the existing salty water there that it remains totally acceptable for its only use – drinking by game.

A computerized model of water seepage has been developed for Rössing by an international firm of engineering consultants. Its purpose is to help predict seepage flow and to enable the mine to continue to improve its water management techniques.

To ensure that water quality both on and off the Rössing property is properly monitored, water samples are continually collected from a series of boreholes, for laboratory testing. The boreholes in the Khan River bed are both upstream and downstream from the mine. Monthly reports are submitted to the Department of Water Affairs and regular discussions are held on the results. This government department is responsible for both water supply and for policing the quality of water returned to the environment by industries.



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PEOPLE AT RÖSSING

Rössing employs about 2600 people. The mine is situated in an inhospitable desert where originally there were few local people with the skills required, and so the company had to attract people from all corners of Namibia and elsewhere.

Rössing's objective is to build up an indigenous workforce with all the skills necessary to run the operation efficiently and in doing so to contribute to the stable development of the national economy.

At Rössing there are no separate classes of 'indigenous' or 'expatriate' employees; there are no special employment contracts or different salary scales. The company's employment conditions and practices are entirely non-discriminatory. All employees are graded according to the internationally recognised Paterson Scale regardless of race, colour, sex or any other consideration. Jobs are graded on the Paterson job evaluation system according to the level of decision-making, and range from grades 1 to 13 (grades 1 and 2 being unskilled levels, 3 to 8 semi-skilled and 9 and above skilled).

The minimum cash wage (excluding bonuses and overtime) is R356 per month (1985). In addition, mine employees receive housing at nominal rental, have a comprehensive medical aid scheme, permanent health insurance, life insurance and a pension fund.

Relatively few employees are new, unskilled workers on the minimum wage. Owing to the sophisticated, mechanized nature of the operation the manpower structure bulges in the middle, in the R500 to R1000 per month range. In the past five years, the unskilled base has shrunk considerably and the semi-skilled 'bulge' has enlarged. This process will continue as the effect of training programmes becomes more marked and as productivity continues to improve.

TRAINING

When Rössing commenced production in 1976 the company was unable to recruit suitably trained and industrially experienced Namibians. Most of the local people seeking work at the mine were unfamiliar with industry. To make matters worse, their educational levels were low and many applicants were illiterate. Thus, training of employees had to be extensive and had to begin at an elementary level.

Over the years substantial strides have been made in developing the full potential of employees, in keeping with the company's manpower requirements. In fact, in the past four years about three-quarters have been promoted after successful completion of various levels of training.

The manpower services department and divisional training sections ensure that training and development of employees takes place. While the role of the training specialist is that of developer, instructor, facilitator, administrator and consultant, the responsibility to develop employees lies with line management. Rössing has established several programmes to provide for employee advancement.

The operator training programme seeks to provide career paths for all employees in semi-skilled grades. Most employees in these grades receive task-oriented training to ensure competence at each step in the career path. The system is flexible enough to cater for the diverse needs of the various workshops, maintenance crews, operating personnel and clerical functions. It is in use in about 70 sections on the mine.

Employees are appointed to a job once they have been trained in all its component tasks, providing that a vacancy exists. While they function in the job, they receive training for the next one. In this way it is ensured that employees in grades 3 to 8 (60% of the workforce) are fully competent to perform the work required of them.

Promotion is thus based on competence rather than on subjective criteria. Employees can continue to be promoted in this way until they reach their highest level of competence.

To move beyond grade 8, though, usually required some formal qualification. In the workshops and maintenance areas promotion to grade 9 or higher depends on passing a Rössing competence test and a national trade test. Since 1980, 70 operators have passed these tests and have become artisans.

Since 1979, when formal training of operators began at Rössing, 1200 employees have been trained as part of this programme. It has proved to be an excellent system, holding considerable benefit for employees, for line management and for the mine as a whole. These benefits include higher productivity, lower costs, fewer accidents, greater employee morale, stability and, of course, promotion.

A student programme began in 1978. It is open only to Namibians and its aim is to provide Rössing's future managers. School leavers interested in a career with Rössing are selected each year from many applicants. They spend one year at Rössing during which they receive bridging education in mathematics, science and English. During this period they also receive leadership training and broad exposure to the mine and its systems, as well as grass roots exposure in the discipline of their choice. After successfully completing this first year they are sent to a university or technical college for degree or diploma courses in such fields as mining engineering, personnel management, electrical engineering, accountancy, commerce and data processing. Several students have been sent to overseas universities.

The student continues to be a Rössing employee during his study period and all employment benefits continue to accrue. On qualifying, the new graduate begins his career at the mine and receives the necessary exposure and training to further his development. There are currently 30 students on this programme.

Apprentice training started at Rössing in 1978 and since then 45 apprentices have qualified as artisans. Twenty seven of these still work at the mine. The number of apprentices in training at any given time varies between 50 and 70.

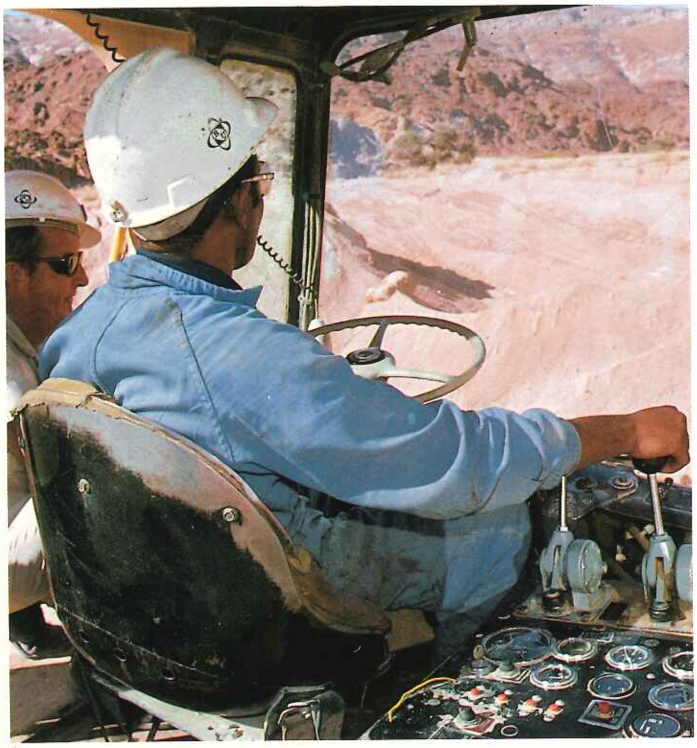
In the first year apprentices receive instruction in the apprentice training centre in all the skills of their chosen trade. In the second and third years they spend most of their time in workshops acquiring practical exposure. The rest of their apprenticeship is spent in the training centre upgrading their skills and theory.

It is the company's policy to fill vacancies from within, whenever possible. To be considered for promotion an employee must demonstrate competence either by passing a predetermined test or by successfully performing the work expected of him.

The 2200 promotions which have taken place in the past four years have resulted in a large increase in the number of black employees in grades 7 and above. Many employees who have not yet been promoted have been enabled meanwhile to perform better in their current jobs.

Training and advancement are always based on careful assessment of employee potential. At Rössing a manpower planning and co-ordination section ensures that the mine's manpower requirements are properly planned and that line managers are aware of all possible options to provide for their needs.

To assist in the task of assessment, psychological measurements are used to identify potential. Among the qualities measured in this way are trainability, aptitude, interest, personality and managerial capability. Tests range from the fairly simple to assessments lasting several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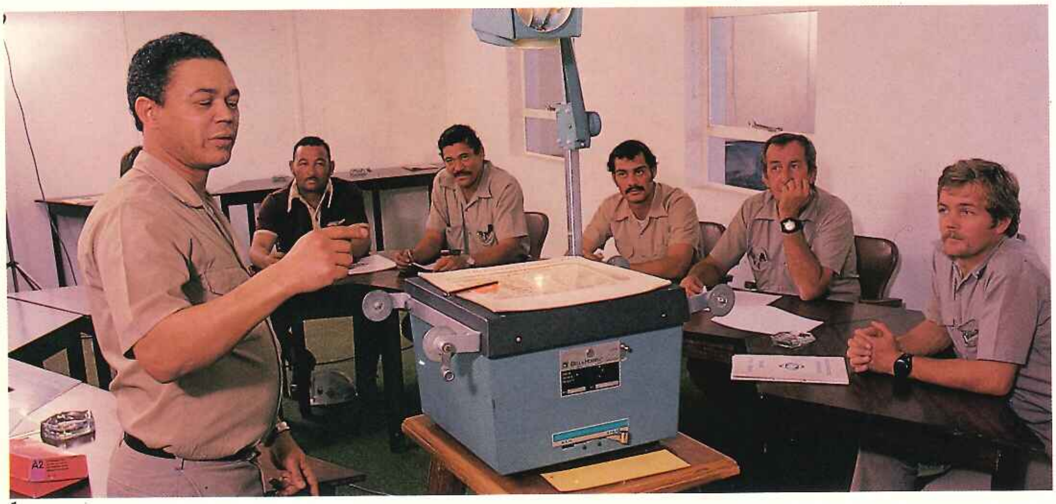
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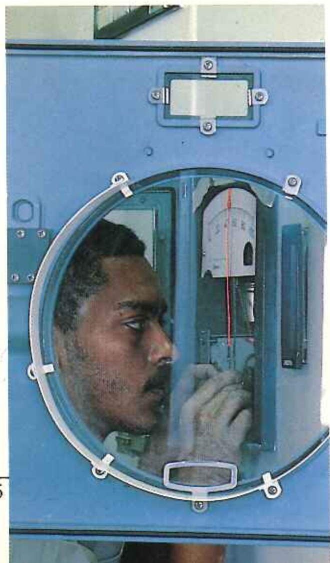
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days. It must be ascertained what the strengths, weaknesses and eventual potential of employees are. Tests have been particularly successful in measuring the aptitude and potential of those who are under-educated and who have had little or no previous industrial experience.

Many Namibians due to lack of opportunity, have a low level of education and are either illiterate or semi-literate. For this reason much effort at Rössing goes into teaching English literacy and encouraging employees to undertake correspondence studies. In 1984 there were 160 employees studying by correspondence and a further 91 had successfully completed literacy training. Correspondence students include those striving for school certificates, national technical certificates, various degrees and diplomas.

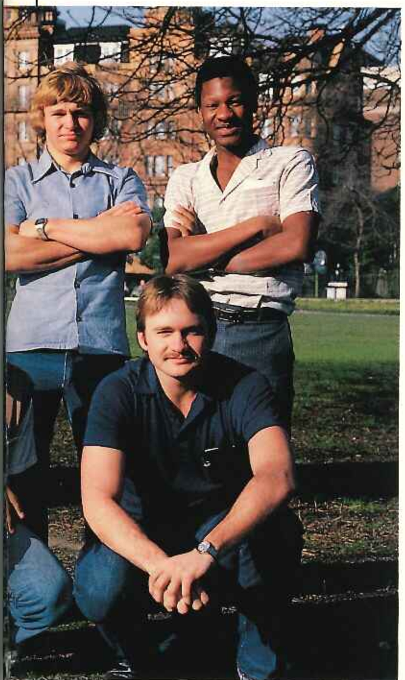
The mine's emphasis on safety and good housekeeping is supported by first aid training and National Occupational Safety Association courses; 280 employees attended NOSA courses during 1984 and 539 employees received first aid training.

The industrial relations department conducts courses each year for employees and management representatives. The Central Training Department assists in the development of course material such as video and slide presentations.

The mining division at Rössing has a programme of training in analytical trouble shooting techniques (ATS), developed by a firm of consultants. This programme has been used to train 200 personnel in full ATS techniques and a further 500 have been through a one-day appreciation programme.

The engineering division is responsible for all driver training and in 1983 and 1984 more than 200 employees were taught to drive vehicles ranging from extra heavy-duty trucks to motorcycles.

The manpower services department produces its own video tapes such as 'Health and Safety', 'Tyre Care' and 'Sampling and Titration'. These videos are used for both instruction and information.



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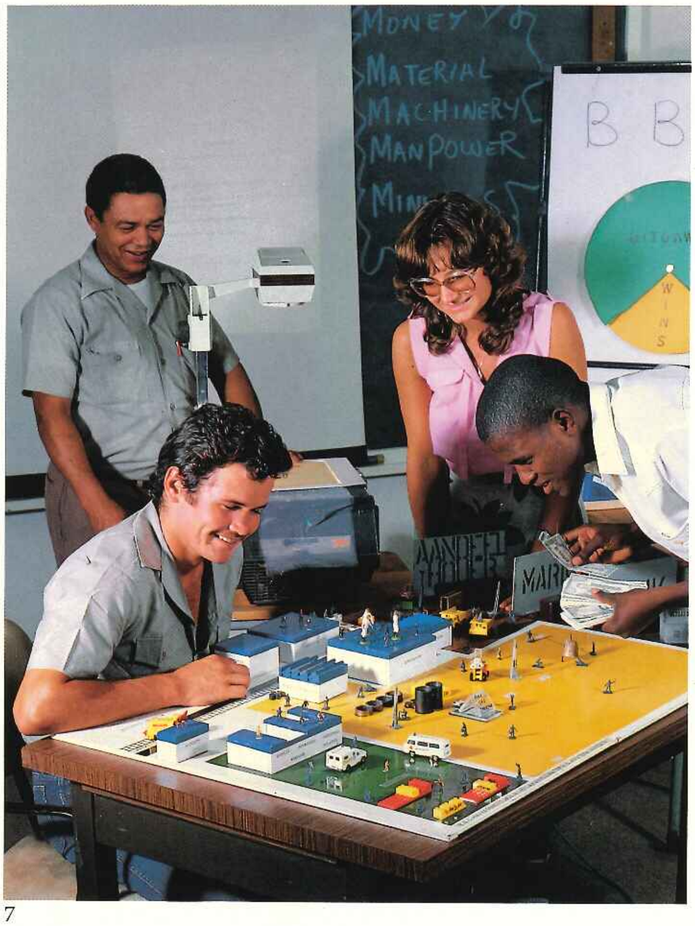

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1. An instructor conducting a course for supervisors.
2. An instructor explains the use of heavy pit equipment.
3. Learning to drive a 150 tonne haultruck.
4. Some of the young Namibians selected by Rössing to attend British universities before filling professional posts in the company. They are seen in London at the commencement of their studies.
5. An apprentice electrician learning his chosen trade at Rössing.
6. An employee receives instruction in the rubber lining workshop.
7. Employees attending a course on basic business concepts.

All new employees follow a careful programme of induction, being made aware of conditions of employment, industrial relations, safety and employee benefits.

Ancilliary courses such as speed reading, time management, transactional analysis, assessor training and basic business concepts are conducted whenever necessary. A secretarial training centre provides training on word processors as well as giving full clerical and secretarial skills training.

Leadership in any organisation is probably its most important resource. With this in mind, many specially designed supervisory and management courses are conducted to ensure that those in leadership positions have the necessary knowledge and skill in man and resource management to make a significant impact on productivity, efficiency and stability.

Rössing invests about R4 million a year on the training of employees.

INDUSTRIAL RELATIONS

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Good communications, fair disciplinary and grievance procedures and a democratic system of employee representation are the four cornerstones of Rössing's industrial relations.

In a large organisation it is easy for an employee to feel he has lost his individuality and is nothing more than a cog in a machine. If this problem is left unattended it can lead rapidly to disillusionment with the company and consequently to reduced work output, increased absenteeism and labour turnover. To overcome this situation, Rössing has expended considerable effort towards providing effective channels of communication for employees.

Once a week the Rössing News is published. In frequency and content, it is more characteristic of a local newspaper than a company magazine and has a wide and loyal readership among employees and their families.

At monthly intervals, the General Manager issues a brief to all employees to keep them informed on matters of importance affecting the company. These include achievements, problems, new senior appointments, new or revised policies, changes to conditions of employment and so on. The briefing group system ensures face to face communication between employees and their supervisors at all levels and is the most reliable method of ensuring that a message is passed along accurately and rapidly.

Other methods of communication include the production of a weekly information sheet for line management, and the holding of safety meetings once a month in every section of the mine to enhance awareness and understanding of safety rules and procedures.

An effective downward flow of communication is a function of good management, but at Rössing equal attention is paid to effective upward communication. In each division on the mine there is a Divisional Personnel Officer attached to the Industrial Relations Department. The DPOs, as they are called, fulfil an important role in helping to resolve, rapidly and at root cause, any conflict or problem which may arise. The DPOs advise both line management and employees in the interpretation of personnel policies and conditions of employment. Should an employee break the rules the DPO conducts a thorough investigation before any disciplinary action is taken – for example, obtaining statements from all involved – and only then presents a dossier containing all relevant facts to line management for them to take a decision. This procedure helps to ensure fairness and justice by providing for a cooling-off period as well as by concentrating on factual rather than emotional content. Should an employee feel that he has been unfairly treated, he has the right to appeal to a higher level of management, and the DPO will assist him in preparing his case.

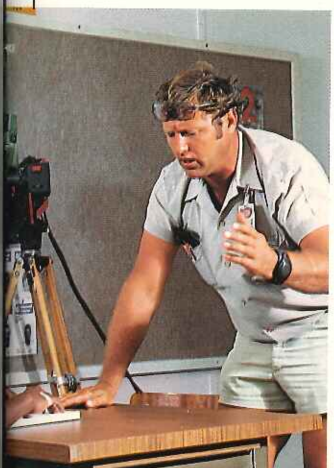
DPOs constantly monitor the state of labour relations in their divisions through regular personal contact with employees in the different sections, and through the production of monthly absenteeism and turnover statistics. The statistics are analysed on a departmental and sectional basis to identify any adverse trends and these are then investigated in conjunction with line management to determine possible causes, to enable appropriate remedial action to be taken.

The most important source of information on employee grievances and problems is from the mouths of the employees themselves. To channel this source, the company has established an employee representative system – the Rössing Council. The system has a two-tier structure. It consists of five divisional committees at the lower level, where elected representatives meet with their respective divisional managers to consult on matters affecting the interests of employees within the divisions. In addition, a residential committee meets with relevant members of management to discuss offsite matters relating to such things as housing, transport, medical facilities, sport, recreation and welfare. The employee representative chairman and vice-chairman of each of the six lower tier committees are 'ex-officio' members of the upper tier Rössing Council. This meets at less frequent intervals with the General Manager to discuss policy issues and matters affecting the interests of employees across all divisions.

A feature of the Rössing Council system is the wide range of items raised at its meetings. Many tangible benefits have accrued to employees through the efforts of their representatives, including an extension of permanent health and personal accident covers, changes to the design of new company houses and improvements of leave privileges for employees in lower grades. Representatives receive specific training in their functions and duties, have permanent representation on the company job evaluation grading committee, medical benefit society and pension fund, and have the right to assist their colleagues in disciplinary and grievance cases if requested to do so by the persons concerned.

The Rössing Council system is not intended to supplant trade unions and the company is prepared to recognise any union which represents a majority of Rössing employees. However, at present trade unionism is little developed in Namibia.

1. *A mechanic in the mine maintenance workshops discusses a problem with his foreman and the divisional personnel officer.*
2. *Role play is used in industrial relations training.*
3. *The general manager's monthly briefing is read to employees in the rubber lining workshop by the general foreman.*
4. *An employee caucus meeting which forms part of the Rössing Council system.*



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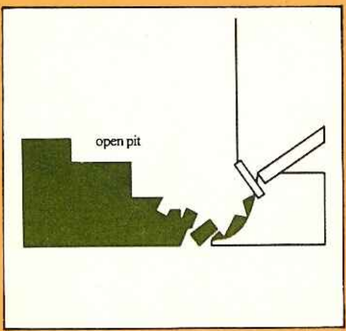
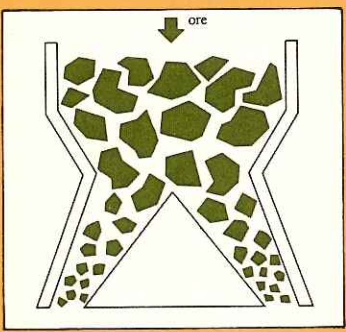
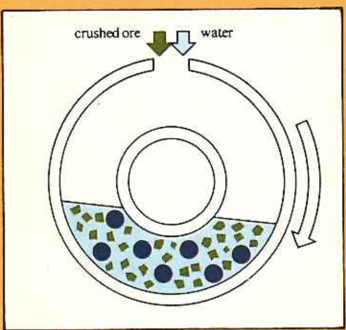
THE MINE



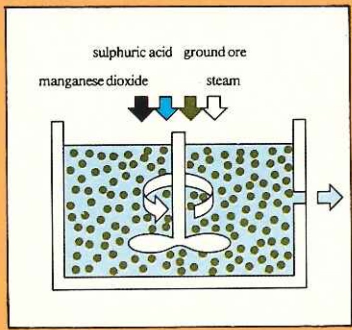
1) MINING (1)
The uranium ore at Rössing is recovered by drilling, blasting, loading and haulage. The material is sent to the primary crushers (2) or to a low-grade stockpile. Waste goes to a separate dump.



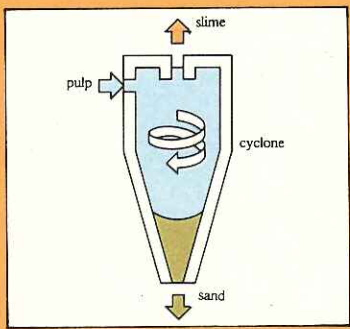
2) CRUSHING
Ore is delivered to the primary crushers (2) and then by conveyor to the coarse ore stockpile (3). It then passes through further series of crushers and screens (4) until the particles are -14 mm. This fine ore, after weighing (5) is stored on another stockpile (6).



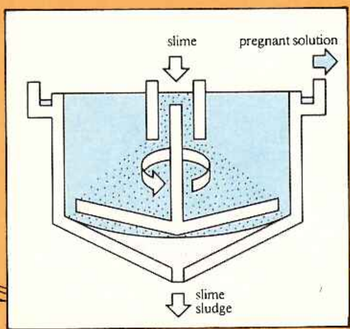
3) GRINDING
Wet grinding of the crushed ore by means of steel rods reduces it further to a slurry with the consistency of mud. The four rod mills (7), 4,3 metres in diameter, operate in parallel.



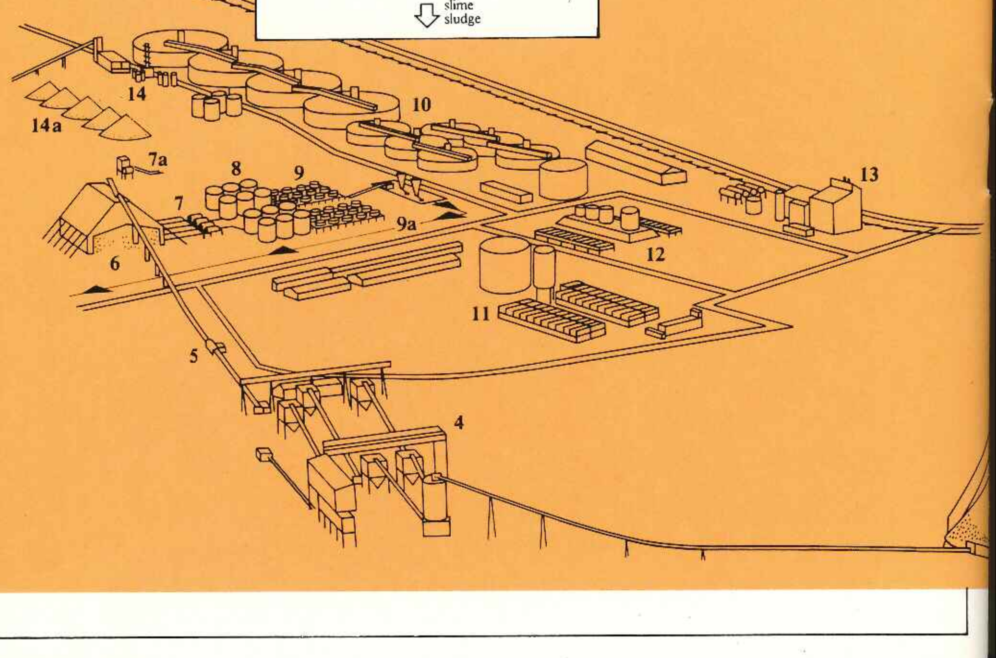
4) LEACHING
A combined leaching and oxidation process takes place in large mechanically-agitated tanks (8). The uranium content of the pulped ore is oxidised by ferric iron and manganese dioxide and dissolved by the action of sulphuric acid at elevated temperatures.

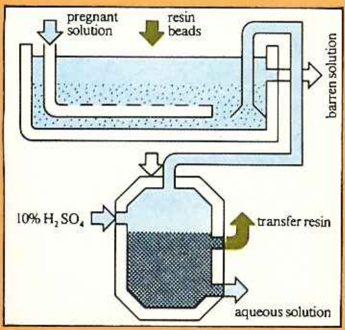


5) SAND/SLIME SEPARATION
The product of leaching is a solution containing suspended sand and slime. Cyclones separate these components and the sand, after washing in Rotoscoops (9) to remove traces of solution, is pumped through pipes (9a) to a tailings disposal area.

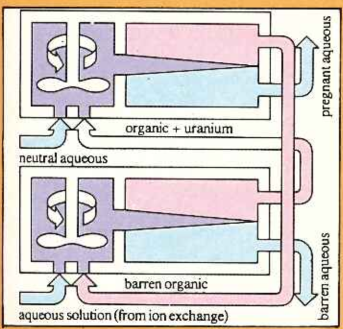


6) THICKENING
Counter-current decantation thickeners (10) wash the slimes from the previous stages. A clear uranium-bearing solution ('pregnant' solution) overflows from the No. 1 thickener while the washed slime is mixed with the sands and pumped to the tailings area.



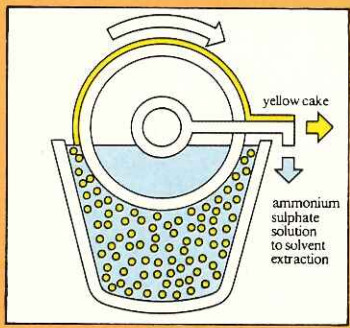


7) CONTINUOUS ION EXCHANGE PLANT-CIX (11)
The clear pregnant solution now comes into contact with beads of specially formulated resin. Ions containing uranium are absorbed onto the resin and are preferentially extracted from the solution.
Beads are removed periodically to elution columns where a strong acid wash removes the uranium from the beads. The resulting eluate contains uranium in solution.

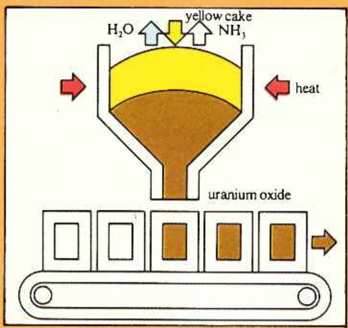


8) SOLVENT EXTRACTION PLANT-SX (12)
The acidic eluate from the ion exchange plant is mixed with an organic solvent which takes up the uranium-bearing component; in a second stage, the organic solution is mixed with a neutral aqueous ammonium sulphate solution which takes up the uranium producing 'OK liquor'.
The acidic 'barren aqueous' solution returns to the elution columns.

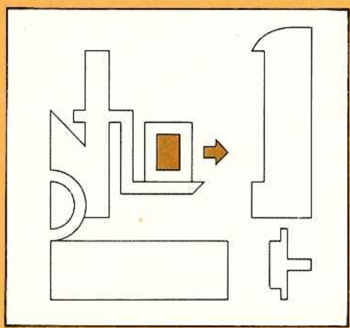
9) PRECIPITATION (13)
The addition of gaseous ammonia to the OK liquor coupled with a pH adjustment, precipitates ammonium diuranate which is then thickened to a yellow slurry.



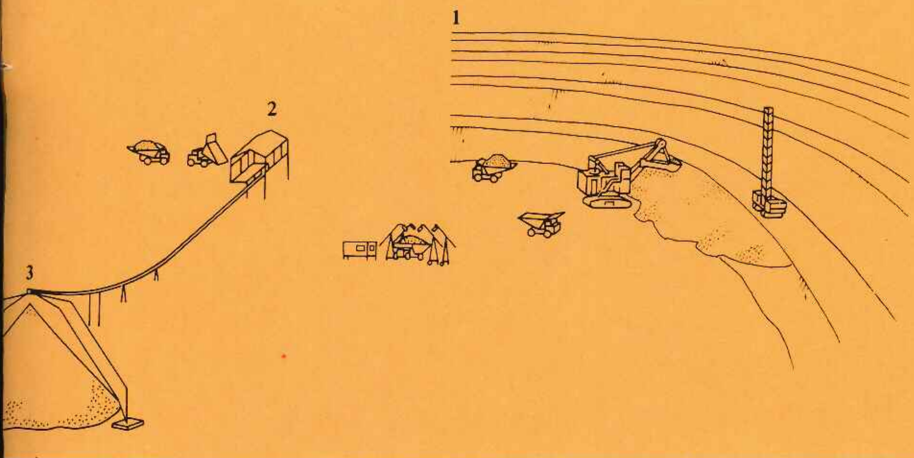
10) FILTRATION (13)
The ammonium diuranate is recovered on rotating drum filters as a yellow paste – 'yellow cake'.



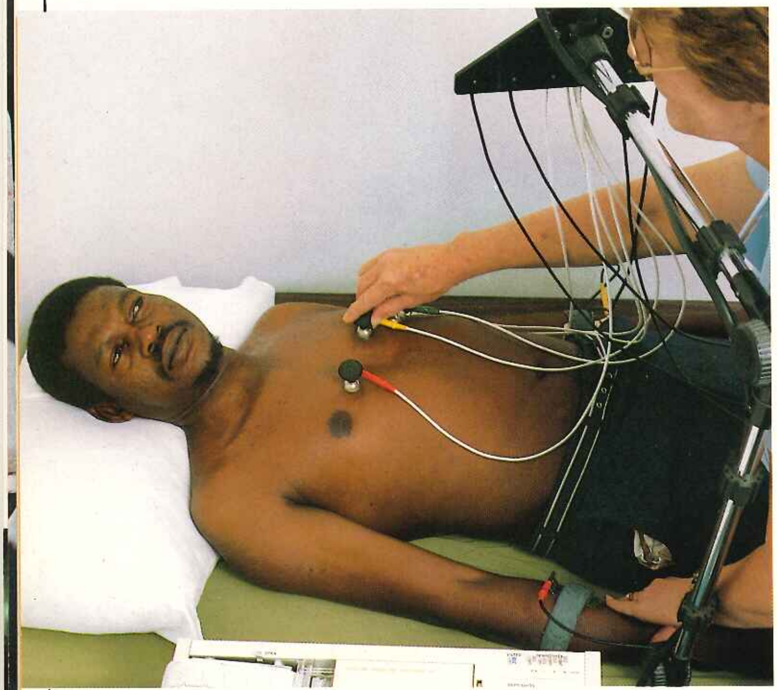
11) DRYING AND ROASTING (13)
Final calcining drives off the ammonia leaving uranium oxide. The product is then packed into metal drums.
Ammonium diuranate is not an explosive material and neither is uranium oxide. The product may therefore be safely transported in steel containers.



12) LOADING AND DESPATCH (13)
The drums of uranium oxide are loaded and exported to overseas customers for further processing.
In addition to the ore mined in the open pit, other raw materials needed to process uranium are water, sulphuric acid and manganese dioxide. Sulphuric acid is produced from pyrites (14a) in the company's own plant (14).
Manganese dioxide is ground up in a ball mill (7a) and delivered as a pulp to the leach tanks (8).



SAFETY, HEALTH AND MEDICAL CARE



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The mining of uranium in a remote desert area is a great challenge to industrial medicine and to social standards, and this led to the establishment of a comprehensive occupational health service at Rössing. The company views medical services as a complete concept. Apart from seeking to ensure good health of employees and their families, it also entails the advancing of both physical and psycho-social well-being at work and at home. The three broad categories where services are rendered are preventive services, curative services and rehabilitation.

Experience serves to underline the saying: Prevention is better than cure. Situations and agents that could damage the workers-safety and health are identified, quantified and controlled. Special departments constantly monitor the environment and conduct a rigorous programme to prevent accidents. Rössing's safety policy states, in part, that safety will take precedence over expediency and short cuts and, in fact, the mine holds the highest, 5-star rating of the National Occupational Safety Association, and, in 1983, achieved three million man-hours without a disabling injury.

A public health team is responsible for keeping a constant vigil on the mine and in the residential areas. It does immunisations and tracks down and treats contagious diseases. Another important aspect of the team's daily tasks is to advise people on social problems such as alcoholism and smoking and on family planning.

The regular medical examinations which Rössing's employees undergo as part of the preventive programme at the same time monitor the effectiveness of the preventive measures taken. All employees are medically examined before, during and at termination of employment. The frequency of these examinations is determined by the type of work the employee performs. Food handlers, bus drivers and workers from the final

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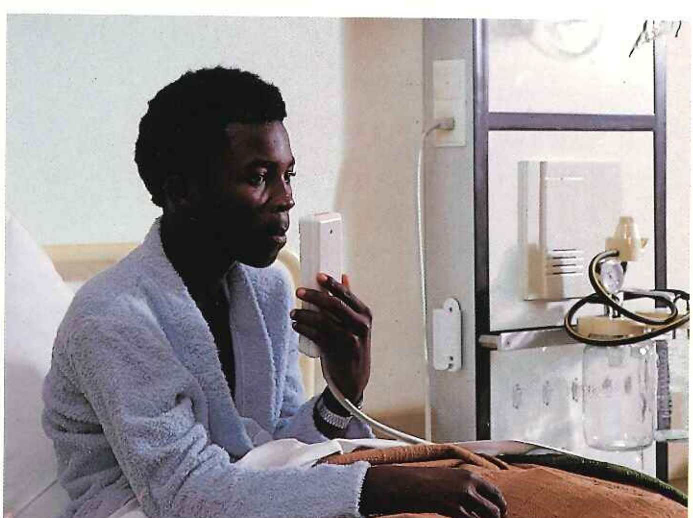
1. *An ECG is one of the many tests carried out as part of medical examinations of employees.*
2. *Blood samples being checked in the occupational health laboratory at Rössing.*
3. *A patient calling for a nurse at Rössing's cottage hospital in Swakopmund.*
4. *One of the regular safety meetings in progress at the mine.*
5. *An employee has a routine lung function test at Rössing's occupational health centre.*
6. *Surgery in progress at the Rössing cottage hospital.*
7. *An employee receives attention at the mine medical centre.*



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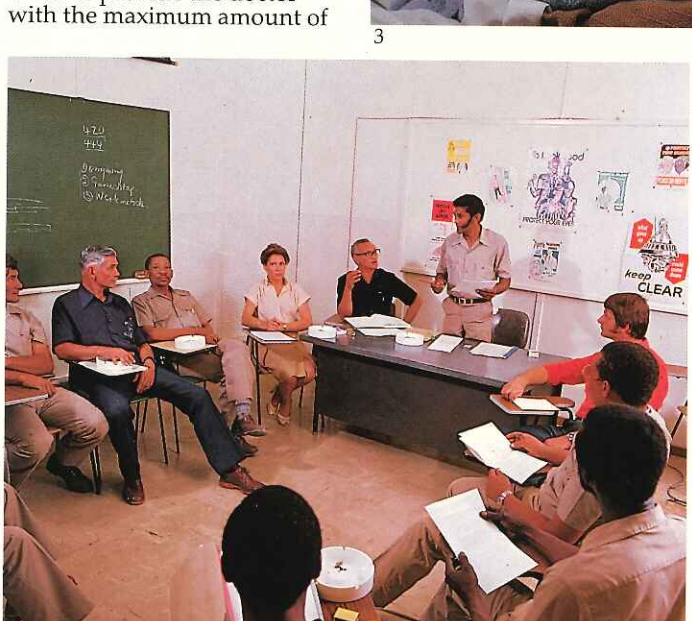
product recovery area are examined once every six months, while other production workers are examined annually. These examinations include a physical examination by a doctor and a battery of special investigations. The latter are chosen and developed in order to provide the doctor with the maximum amount of



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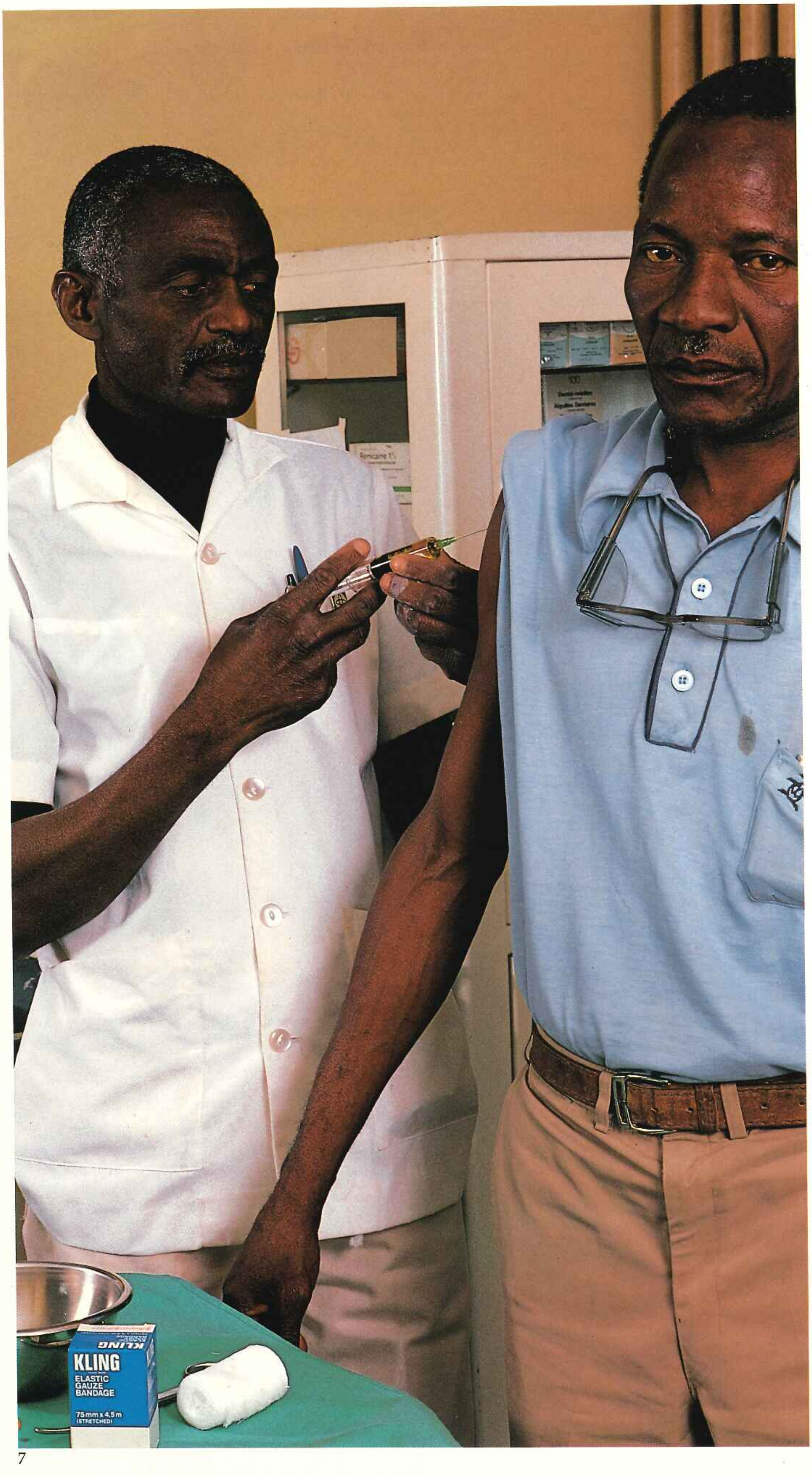
relevant information required to detect and treat abnormalities as early as possible. They include eye and ear tests, x-rays, ECGs, sputum cytology, and a wide range of lung, blood and urine tests. The sophisticated computerized lung evaluation system used at Rössing ranks with the world's best. Specialists visit the mine monthly to report on x-rays, lung functions, skin and eye conditions. Comprehensive records are kept on the health of each employee and people who leave the company are required to notify the Chief Medical Officer of any subsequent changes in health.

Curative medical facilities include a well equipped medical centre in Arandis as well as a modern hospital in Swakopmund. Patients are able to consult doctors during normal consulting hours and make use of emergency facilities on a 24-hour basis. An increasing number of operations are performed locally rather than sending patients to Windhoek and elsewhere. Where the local medical practitioners lack specific medical expertise, specialists are brought in to perform the operations locally. The costs associated with the provision of curative services are jointly shared by contributions received from Rössing and the company's employees through the Rössing Medical Benefit Scheme.

The third aspect of a comprehensive medical service is rehabilitation of the injured or ill. Ample paid sick leave, together with disability insurance, ensures that employees are not bothered by financial problems during the recovery period.

Owing to its excellent safety record, Rössing has an extremely low incidence of disabling injuries. It is more likely that accidents on the public road or on the sportsfield will lead to permanent disablement of an employee. To deal with this, Rössing operates a system which assists disabled employees to find suitable positions when they return to work. Employees disabled to such an extent that they are unable to continue employment are assured of a generous monthly income and they remain members of the medical benefit scheme.



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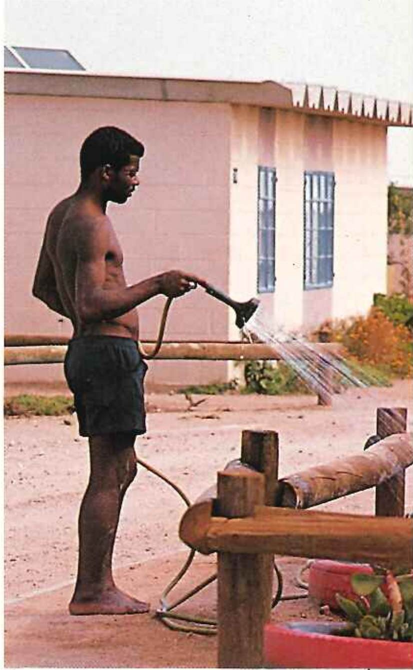
HOUSING AND SOCIAL AMENITIES

Rössing's objective is to offer every employee the chance to bring his family to live in one of the comfortable residential areas provided by the mine. At the end of 1984 the mine had provided – at nominal rental – houses for 1 546 families and single quarters for 573 people. Family houses have been provided for all those who request them, but there are still some married men living voluntarily in single quarters; these mainly have smallholdings in rural areas and elsewhere in Namibia and elect to leave their families there to farm.

Rössing has three housing areas in which homes are allocated according to the grade of the employee – Arandis, Tamariskia and Vineta. The last two are suburbs of Swakopmund.

The town of Arandis was built to accommodate Rössing's less skilled workers. In ten years it has not only developed physically into a comfortable town with civilised amenities – it has also grown into a community where people of widely different ethnic backgrounds live side by side in harmony. In some ways Arandis can be considered a microcosm of what Namibia should become in the future.

While Rössing administers the town, residents have a strong input in such matters as the design of houses and public amenities. Because many residents are from rural backgrounds it is necessary for them to adapt to an urban lifestyle. The Community Department assists with this and avoids an atmosphere of 'teaching down' by encouraging new residents to join clubs in which residents of longer standing are able to help them.



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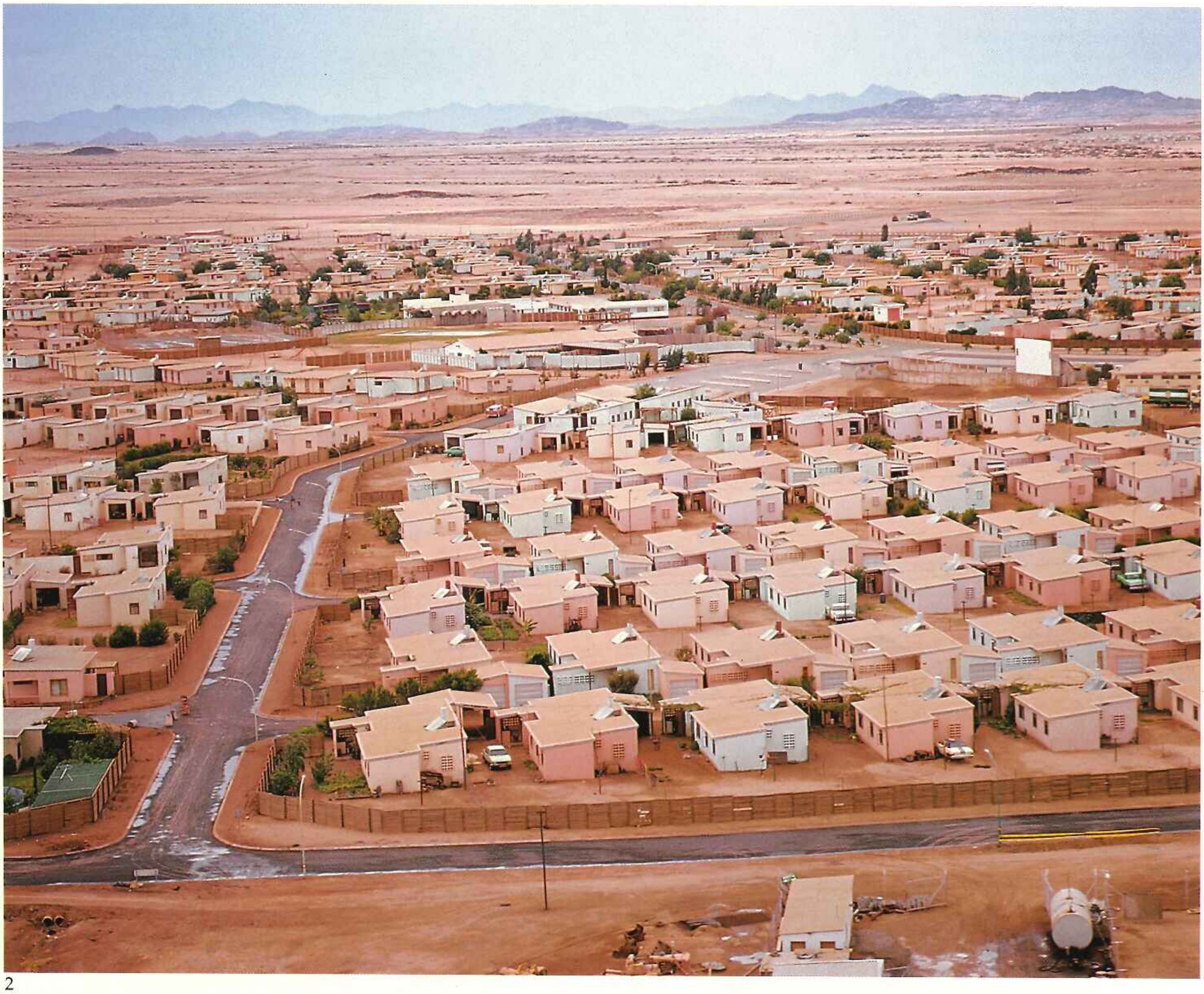

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1. *A Rössing employee watering his garden in Arandis after work.*
2. *An aerial photograph showing part of Arandis.*
3. *The strength and skill of Rössing tug o' war teams are feared by their adversaries on the sportsfields of Namibia.*
4. *Employees of the company seen relaxing in the pub of the Rössing Country Club.*
5. *Youngsters play table tennis at the Tamariskia community centre in Swakopmund.*
6. *Members of the Arandis Club enjoy drinks on the terrace.*
7. *Science class at the Arandis secondary school.*
8. *The son of a Rössing employee at tennis practice in Arandis.*
9. *The Arandis Clothing Co-operative.*


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Houses in Arandis are of a high standard with solar hot water systems, electricity, and water-borne sewage. They have three or four bedrooms, a bathroom complex, kitchen (with electric cooker) and a central living room with dining area. Newer houses have garages.

Single-quarter units have been built consisting of 24 to 30 single rooms with communal lounges. There is a concierge for each unit who also looks after its surroundings and gardens.

Central community services include a library, a community centre, a social club, swimming pool, open-air beer garden, a community hall, children's play area, an amphitheatre and a non-denominational church building.

Sporting and recreational facilities include a main stadium comprising grassed football field, athletics track and changing rooms, two tennis courts, two netball fields, practice football fields and a gymnasium. Sport has a high priority among Arandis residents, and Rössing sportsmen and sportswomen compete at a national level in track athletics, marathon running, boxing and karate.

Businesses in the town include a bank, garage, supermarket, restaurant, bakery, bottle store, furniture shop, butcher's shop and a


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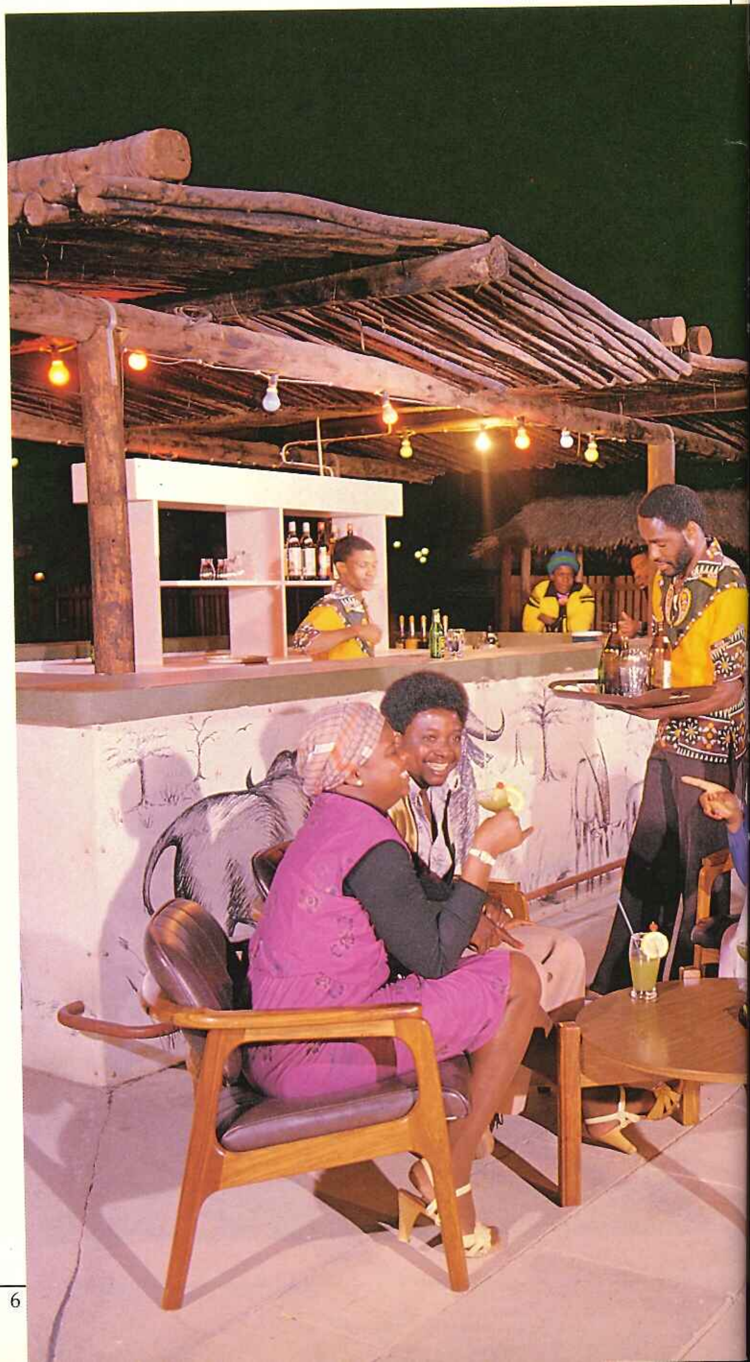
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record and photographic shop. With the exception of the bank, all are privately owned by local people.

A 42-bed hospital – built by Rössing and donated to the State – provides male, female and children's wards, a maternity ward and an outpatients department.

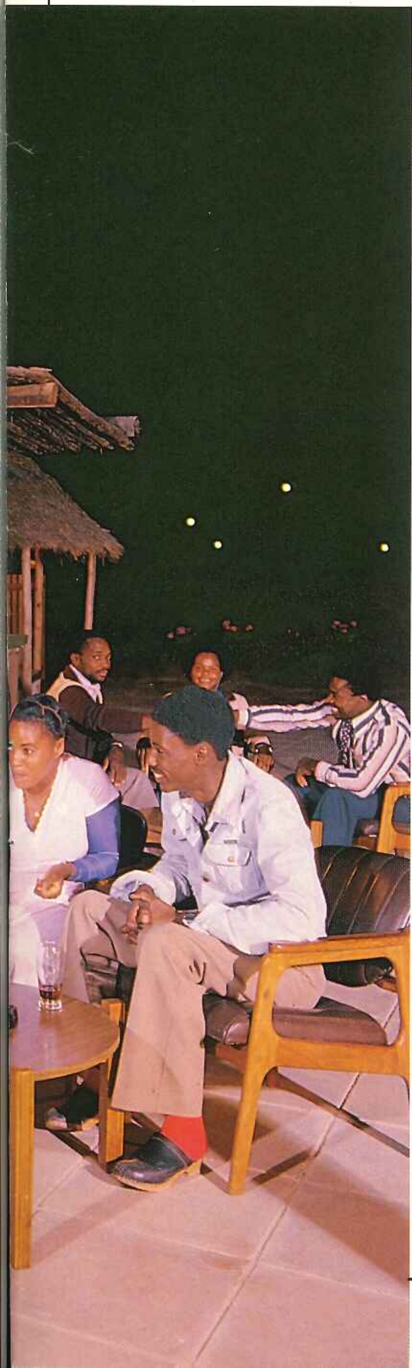
A second primary school and a secondary school were opened in 1981, having been financed with money raised through the Rössing Foundation.

Because most of the employees at Rössing mine are men, and because Arandis was not an existing town when Rössing commenced operations, employment opportunities in the area for women are limited. However, cottage industries are encouraged by Rössing through various craft clubs. These have led to a modest income for women undertaking activities such as leatherwork and specialised baking. Sewing, which started as a cottage industry, has developed into a clothing factory run as a co-operative by a group of Arandis women. The company provided a building and lent the co-op money to buy industrial sewing machines. The loan is being repaid out of part of the profits.

The co-op has entered into an agreement to supply Rössing with working clothes and track suits at market prices. The company's purchasing officers report that the garments are of excellent quality.

Tamariskia and Vineta are home to Rössing's employees in the higher semi-skilled, skilled, professional and managerial grades. When employees are promoted to a level which entitles them to a better house the company makes the new house available as soon as possible – but nobody is forced to move.

Swakopmund is an attractive seaside town with many striking old buildings from the German colonial era. Rössing has established a 30-bed cottage hospital in Swakopmund and a country club outside the town with sporting and dining facilities of a good standard. Membership of this club is available not only to any Rössing employee – whether living in Swakopmund or not – but to other residents of Swakopmund as well.

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RÖSSING'S WIDER HORIZONS

Economic ripples have spread from Rössing across Namibia. Apart from transforming Swakopmund from a quiet seaside town to a thriving business centre – without destroying its traditional charm – Rössing's activities have brought benefit to businesses in other parts of the country.

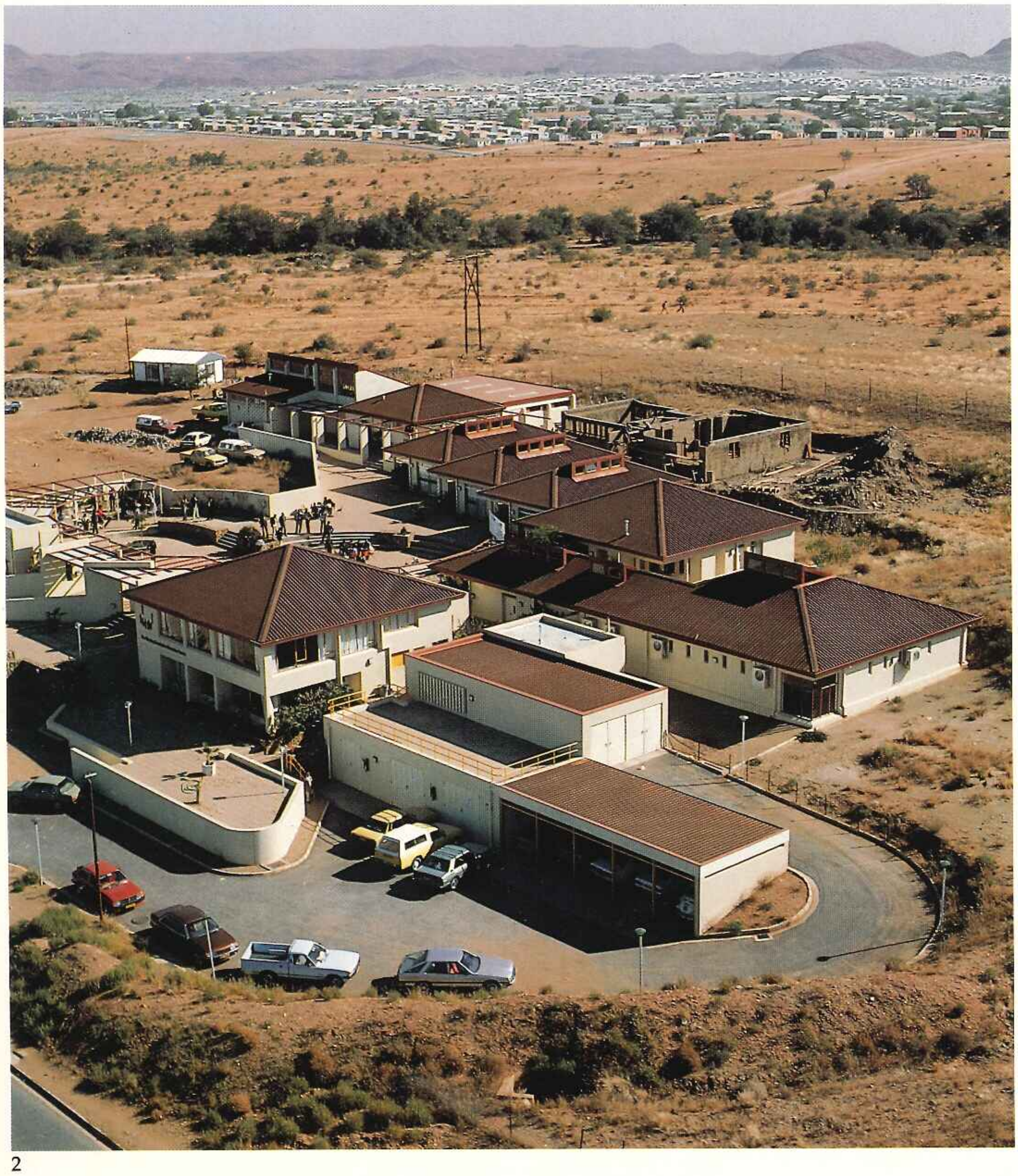
Each year Rössing injects about R120 million into the Namibian economy by way of salaries and the purchase of goods and services. In spite of the relatively low level of industrial development in Namibia, almost half of Rössing's annual purchasing expenditure takes place within the country.

Taxes are paid by Rössing to the revenue offices in Windhoek, for the benefit of the Namibian people.

Through its energetic training programme, Rössing is enlarging the pool of skilled people needed by the country for future industrial development.

But Rössing's presence brings more than just economic benefit to Namibia. The company's example of non-racialism has contributed to a shift in public opinion away from outmoded beliefs based on race.

Some benefits to Namibia happen automatically, as a spin-off from Rössing's operations. However, the company also conducts a deliberate and sustained programme of aid to the people of Namibia, particularly in the field of education. Spearheading these efforts is the Rössing Foundation.



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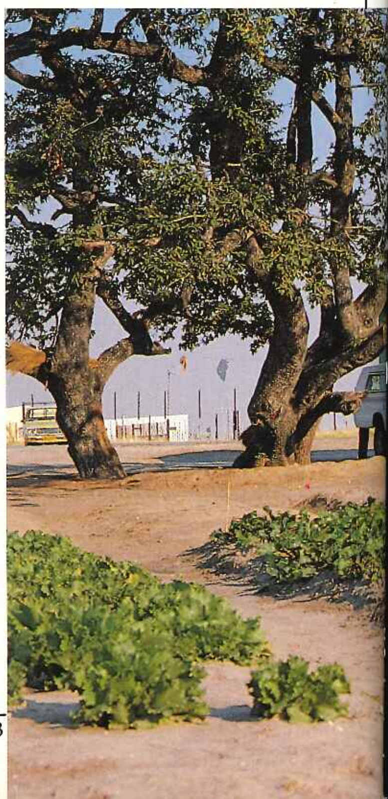

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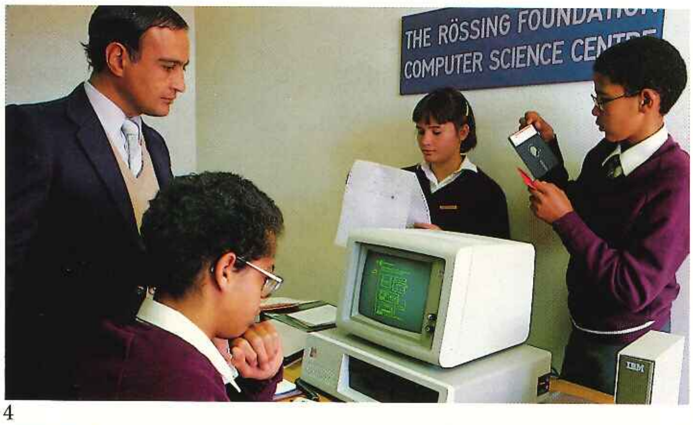
The objectives of the Foundation are based on the premise that the most urgent need of the country is greater educational opportunity for its people – not only formal education, but also education in its broadest sense. In a developing country like Namibia there is a pressing need to provide opportunities for people to acquire practical skills which will enable them to raise their standard of living.

The Foundation has its own full-time director, with executive powers, who is responsible to a multiracial board of trustees from Namibia who include leading businessmen, educationists, lawyers and two Rössing Uranium nominees.

At the outset the trustees identified a real need in the area of literacy and language training. It was decided, therefore, that the Foundation's first project would be an adult education centre which could cater for these basic needs. A principal was appointed and the centre was established in 1979 in a large house – rented and renovated – on the outskirts of the Windhoek business area.

The demand for the courses offered was so great that the trustees of the Foundation had no hesitation in agreeing to the construction of new premises in Windhoek. The new campus was first occupied in April 1982. To date, the expenditure on the new building totals R1,3 million.



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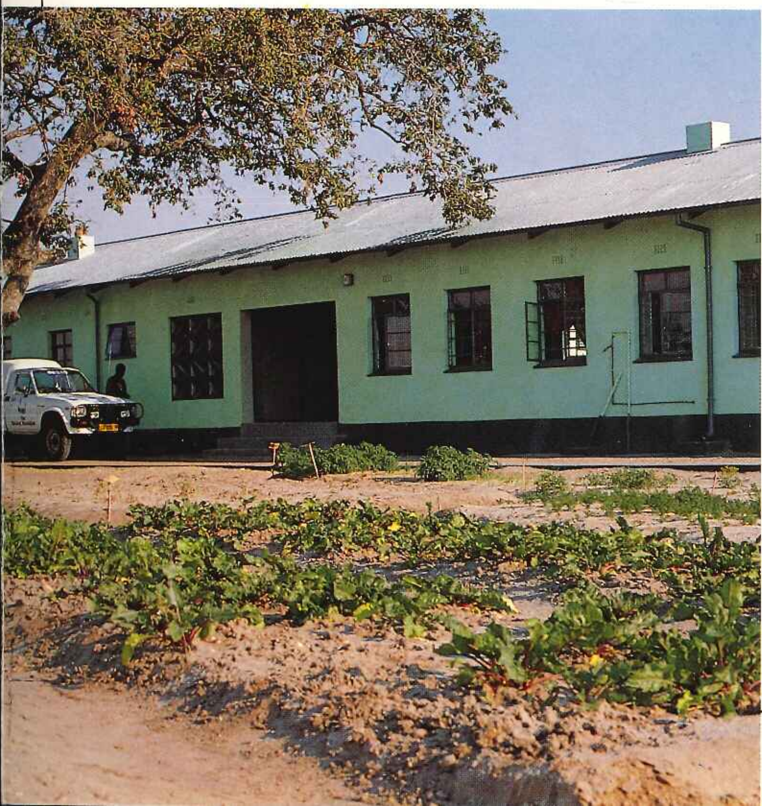
More than 1 000 people have attended courses at the Education Centre since its inception. In 1984 more than 700 students were registered for one or more of the 35 courses offered. These include literacy, three standards of English, German, office procedure, typing and sewing. Assistance is given with preparation for matriculation examinations. In a new workshop complex, courses are offered in leatherwork, vehicle maintenance, workship safety and practical science.

A mobile teaching scheme, operating from the Education Centre, takes health education to the Katutura and Khomasdal areas of Windhoek.

Small satellite education centres are operating successfully in the towns of Okakarara, Okahandja, Otjimbingwe, Lüderitz and Ondangwa. The activities of the Ondangwa centre – in Ovamboland – include practical courses for local farmers and vegetable growers as well as sewing classes for women. The centre is visited regularly by a health lecturer who runs courses in primary health care.

The Rössing Foundation has donated language laboratories to the Ovamboland and Damaraland administrations to help improve the teaching of languages in these areas. These facilities are also used for in-service teacher training and for the training of student teachers. A computer and associated software has been donated to a high school in Windhoek to encourage the teaching of computer science.

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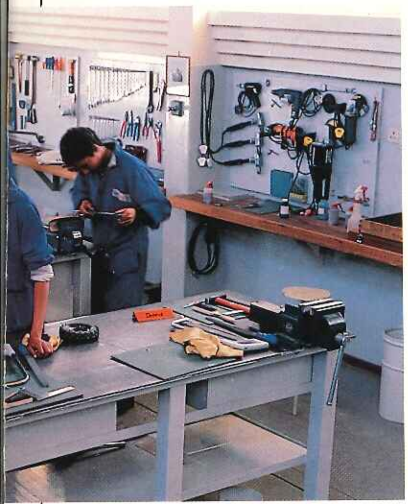
Another major project of the Foundation was the construction of two new schools in Arandis, a well balanced and largely self-contained community, but previously with only one primary school. The money for these schools – a primary school and a secondary school – was provided by an overseas institution interested in education and was channelled through the Rössing Foundation. The schools were completed in 1981 and were donated to the local education authority.

The Rössing Foundation scholarship schemes – through which pre-matriculation students are sent to the United World Colleges of the Atlantic, and Namibian post-graduate students are sent to American or British universities – continue to attract a wealth of applications. Students have attended Cornell, Harvard and London universities as well as the University College of Bangor in Wales. There is no commitment to work for Rössing or the Foundation, but students are required to return to Namibia on completion of their studies. The long term effects of this part of the Foundation's activities will not be felt for many years, but it is hoped that eventually the scholars will find their way into decision-making positions in the Namibian community.

An annual careers guidance seminar, hosted and organised by the Foundation in conjunction with the University of Cape Town and the Department of National Education, has become a prominent feature of the academic year. At the Education Centre in



THE FUTURE

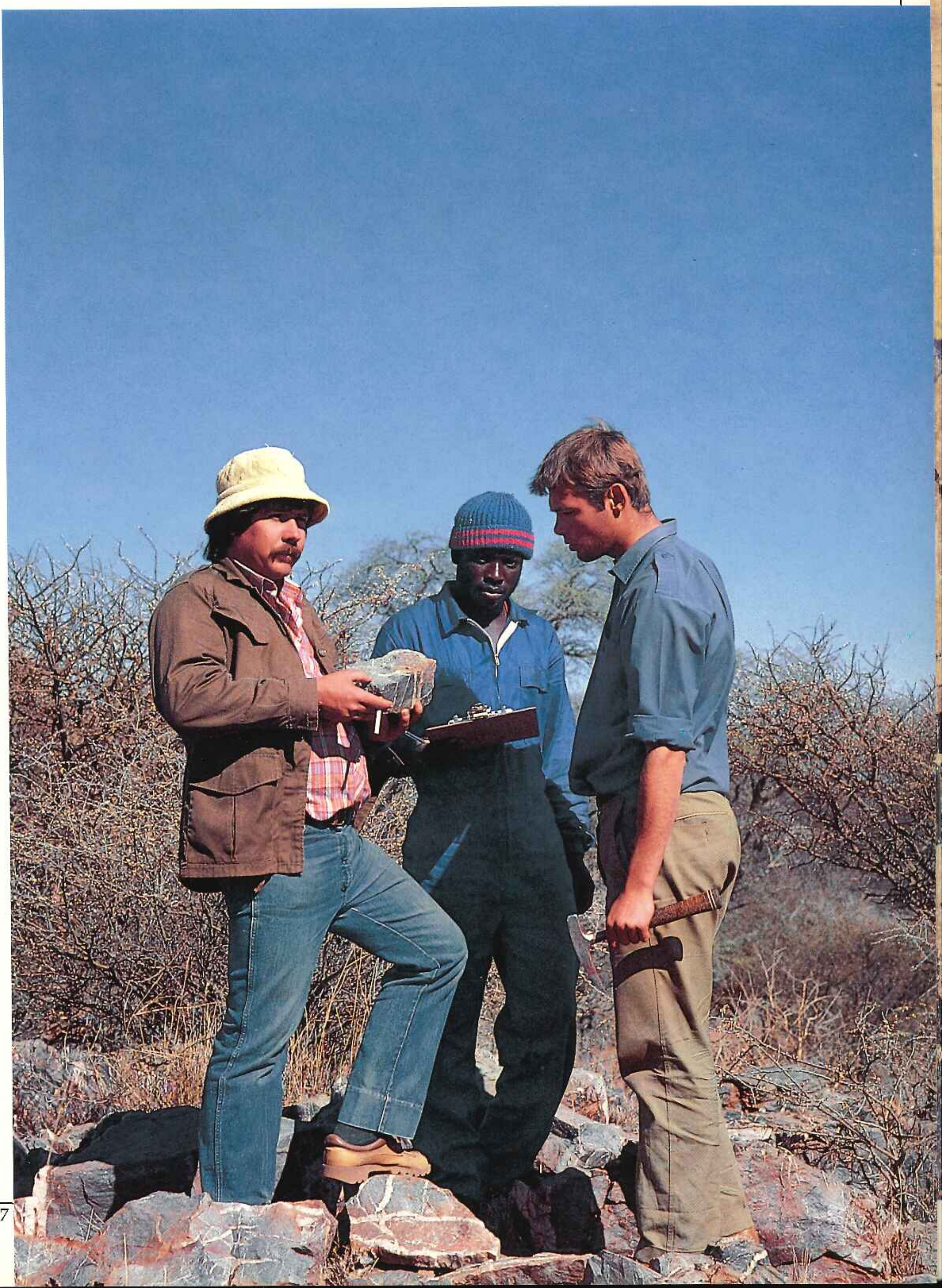
Before an orebody can be mined a mining company makes a substantial capital investment and commits itself to the project in the long term. Rössing Uranium Limited has indeed done this, and its commitment goes beyond the present mine's life. Since 1981 the company has been carrying out extensive exploration for other minerals, throughout Namibia.

Rössing has a stake in the future of the country; in the establishment of a sound environment in which living and educational standards can grow and where its present and future mining ventures can operate to the satisfaction of shareholders, employees and the people of Namibia alike.

Windhoek, up to 70 teachers involved in guidance and counselling gather for a three-day conference and seminar, and this makes a significant contribution towards the better use of the human resources of the country. Guidance and counselling in government schools particularly, has been poorly covered and this leads to a misuse or under use of the potential of many young Namibians. The guidance and counselling seminar goes some way towards rectifying the situation.

Educational activities of the company's head office in Windhoek complement those of the Foundation. The annual Sir Mark Turner Memorial Scholarship sends bright young Namibians to university for degree courses in subjects which will be of practical benefit to the country. Special projects conducted by the company in high schools, with the co-operation of the educational authorities, include 'The Young Scientists', an annual competition and exhibition which is aimed at promoting the study of science.

1. *Needlework class at the Rössing Foundation Education Centre*
2. *The Rössing Foundation. Education Centre in the Namibian capital of Windhoek.*
3. *The Ondangwa Training Centre – one of the Rössing Foundation's satellite education centres.*
4. *The Rössing Foundation donates teaching equipment to schools in Namibia.*
5. *An outdoor class being conducted by the health education unit of the Rössing Foundation.*
6. *A corner of the training workshop at the Rössing Foundation Education Centre.*
7. *Rössing exploration geologists examining rock samples in the field.*



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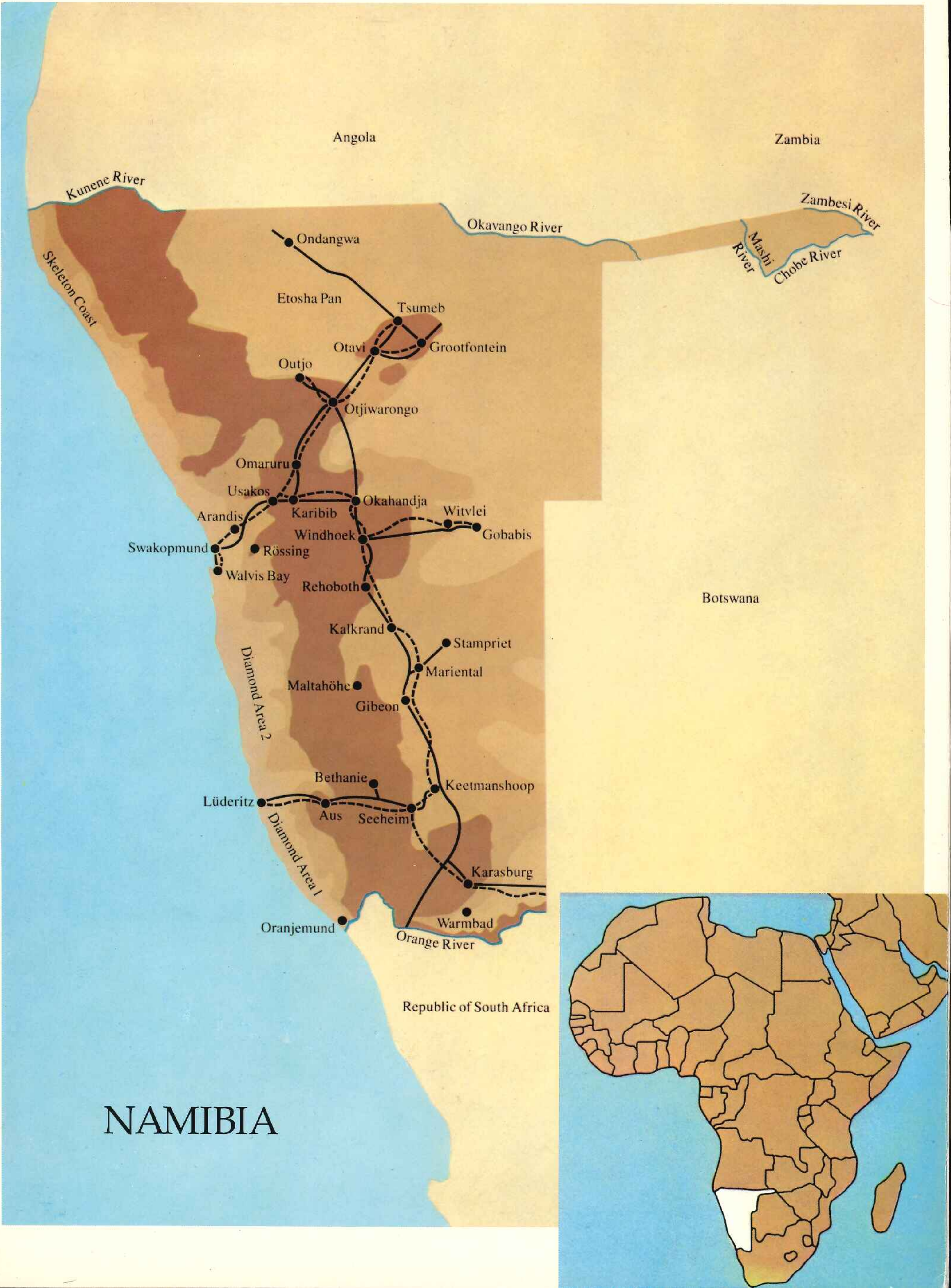
Angola
Zambia
Kunene River
Zambesi River
Okavango River
Mashi River
Chobe River
Skeleton Coast
Ondangwa
Etosha Pan
Tsumeb
Otavi
Grootfontein
Outjo
Otjiwarongo
Omaruru
Usakos
Karibib
Okahandja
Witvlei
Arandis
Windhoek
Gobabis
Swakopmund
Rössing
Walvis Bay
Rehoboth
Botswana
Kalkrand
Stampriet
Mariental
Diamond Area 2
Maltahöhe
Gibeon
Bethanie
Keetmanshoop
Lüderitz
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NAMIBIA

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