



# **Bougainville Copper Limited**

(Incorporated in Papua New Guinea)

**Annual Report 1980**

## Notice of Meeting

The Annual General Meeting of Bougainville Copper Limited will be held at 10.00 a.m. on Wednesday 15th April, 1981 in the Panguna Cinema, North Solomons Province, PNG.

A separate Notice of Meeting is enclosed. All shareholders are cordially invited to attend.

**Bougainville Copper Limited**  
(Incorporated in Papua New Guinea)

**Registered Office:**  
Panguna Province of North Solomons  
Papua New Guinea

**Principal Registered Office in Australia:**  
55 Collins Street Melbourne Telephone (03) 658 3333

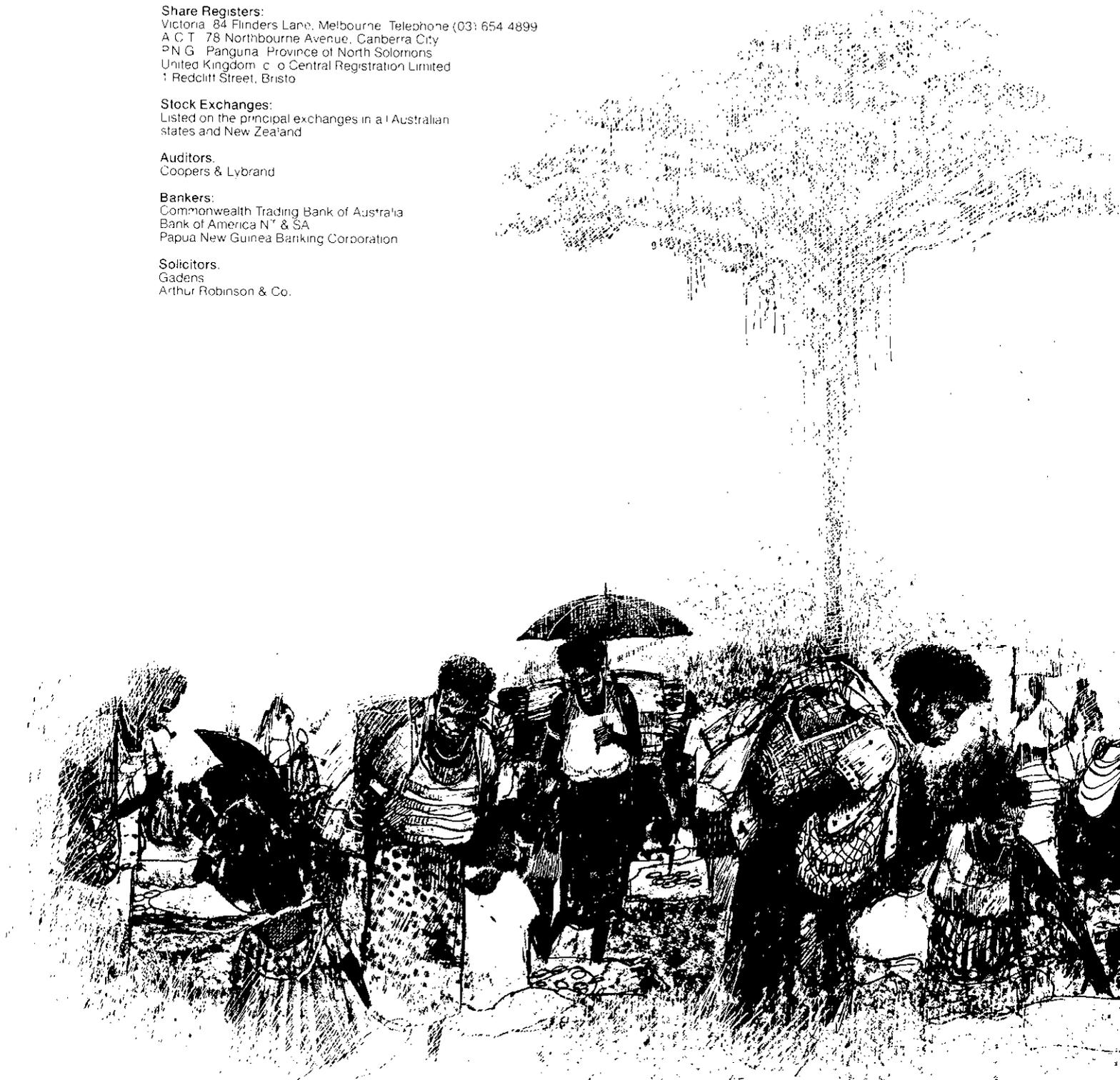
**Share Registers:**  
Victoria 84 Flinders Lane, Melbourne Telephone (03) 654 4899  
A.C.T. 78 Northbourne Avenue, Canberra City  
P.N.G. Panguna Province of North Solomons  
United Kingdom c/o Central Registration Limited  
1 Redcliff Street, Bristol

**Stock Exchanges:**  
Listed on the principal exchanges in all Australian states and New Zealand

**Auditors:**  
Coopers & Lybrand

**Bankers:**  
Commonwealth Trading Bank of Australia  
Bank of America N.Y. & S.A.  
Papua New Guinea Banking Corporation

**Solicitors:**  
Gadens  
Arthur Robinson & Co.





Bougainville Copper operates a large open pit mine and processing facility. It is located at 600m above sea level in the Crown Prince Range on the Island of Bougainville in the North Solomons Province of Papua New Guinea. It produces a concentrate which contains copper, gold and silver. The concentrate is sold principally to smelters in Japan, West Germany and Spain.

Exploration work on the ore body commenced in 1964 and the decision to construct the mine was taken in 1969. The original capital cost was more than K400 million and a further K250 million has been spent on capital works since the commencement of commercial production in 1972.

The production process begins when the orebody is blasted prior to mining with electric shovels. A fleet of 155 tonne haul trucks is used to move the waste material or transport the ore to the primary crushers. After treatment through a conventional flotation process, the concentrate is pumped in a slurry form to the port of Anewa Bay where it is filtered and dried prior to shipping.

In 1980, the Company mined 80 million tonnes of material. Of this, 38 million tonnes of ore was treated to produce 510 000 tonnes of concentrate. This concentrate contained 147 000 tonnes of copper, 14 000 kilograms of gold and 37 000 kilograms of silver and had a gross value of US\$553 million (of which copper contributed 51% and gold 46%).

The Company makes a substantial contribution to Papua New Guinea's economy. It employs approximately 4 300 people and as such is the country's largest industrial employer. The total value of the Company's net sales since start-up is over K2.1 billion which is approximately 50% of the country's total exports over the same period. Total production of the mine to date is 1.5 million tonnes of copper, 171 tonnes of gold and 390 tonnes of silver. Thus the Company is one of the largest copper mines in the world and is one of the major gold producers outside South Africa and the USSR.

Bougainville Copper Limited is owned 53.6% by CRA Limited, 20.2% by the Papua New Guinea Government and 26.2% by public shareholders.

**Directors**

- D. C. Vernon (Chairman)
- N. R. Agonia
- J. L. Auna
- Sir Roderick Carnegie
- Sir Frank Espie, O.B.E.
- R. H. Harding
- P. W. Quodling
- J. T. Ralph

**Alternate Directors**

- J. L. Kekedo
- M. P. G. Togolo

**Officers**

- P. W. Quodling  
(General Manager)
- J. R. Trezise  
(Assistant General Manager)
- B. J. Drew  
(Executive Manager — Mine)
- K. P. Gilbert  
(Executive Manager — Concentrator)
- D. S. Karpin  
(Executive Manager — Commercial)
- V. P. McCartin  
(Executive Manager — Personnel)
- J. M. Tynan  
(Executive Manager — Technical Services)
- J. M. Ferguson  
(Secretary)

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Cover Mt. Bagana, Bougainville Island

# The Year in Brief

		1980	1979
Production:			
Concentrate	(tonnes)	510 397	584 692
Containing copper	(tonnes)	146 813	170 788
gold	(kilograms)	14 050	19 703
silver	(kilograms)	36 856	44 640
Net sales revenue	(K'000)	335 140	339 706
Net earnings after tax	(K'000)	71 534	83 917
Earnings per share	(toea)	17.8	20.9*
Shareholders' funds	(K'000)	584 504	294 532
Return on shareholders' funds	(per cent)	12.2	28.5
Dividends declared:			
gross dividends	(K'000)		
— ordinary		64 170	80 213
— bonus (ex retained earnings)		16 043	26 737
per one kina share	(toea)		
— ordinary		16	20*
— bonus		4	6.7*
Depreciation	(K'000)	43 841	40 730
Government royalties	(K'000)	4 177	4 257
Taxation	(K'000)	51 179	77 900
Number of employees at 31 December		4 293	4 165

\*Figures have been adjusted for the 1980 capital reconstruction.

**January:**

Gold and silver prices reached unprecedented highs of US\$846/oz and US\$49/oz respectively.

**February:**

Copper price jumped to US\$1.44/lb, the highest price for six years.

**March:**

Gold price dropped to the year's low of US\$478/oz.

Silver market disrupted by difficulties with silver futures trading on the New York Commodity Exchange (COMEX).

**April:**

Shareholders approved at the Annual General Meeting an increase in authorised share capital, a 2 for 1 bonus share issue from Asset Revaluation Reserve and a consolidation of fifty toea shares into one kina shares.

**May:**

Payment of the final 1979 dividend of 20 toea per share and 1979 bonus dividend of 10 toea per share (equivalent to 13.3 toea and 6.7 toea respectively after adjustment for the 1980 capital reconstruction). These dividends amounted to K80.2 million and brought the total dividend payment to K388 million since 1972.

Silver price fell to the year's low of US\$11/oz.

**June:**

Half yearly net earnings were K38.0 million.

**July:**

A new five year Compensation Agreement was signed with landowners which provided for payments of K5 million over five years.

**August:**

The value of the Company's exports since commencement of commercial production passed K2 billion.

**September:**

The central bank of Papua New Guinea initiated a Treasury Bill market.

**October:**

Copper production since start of operations in 1972 reached 1.5 million tonnes.

**November:**

The 1980 interim dividend of 8 toea per share was distributed to shareholders.

The Board approved the construction of an eleventh ball mill.

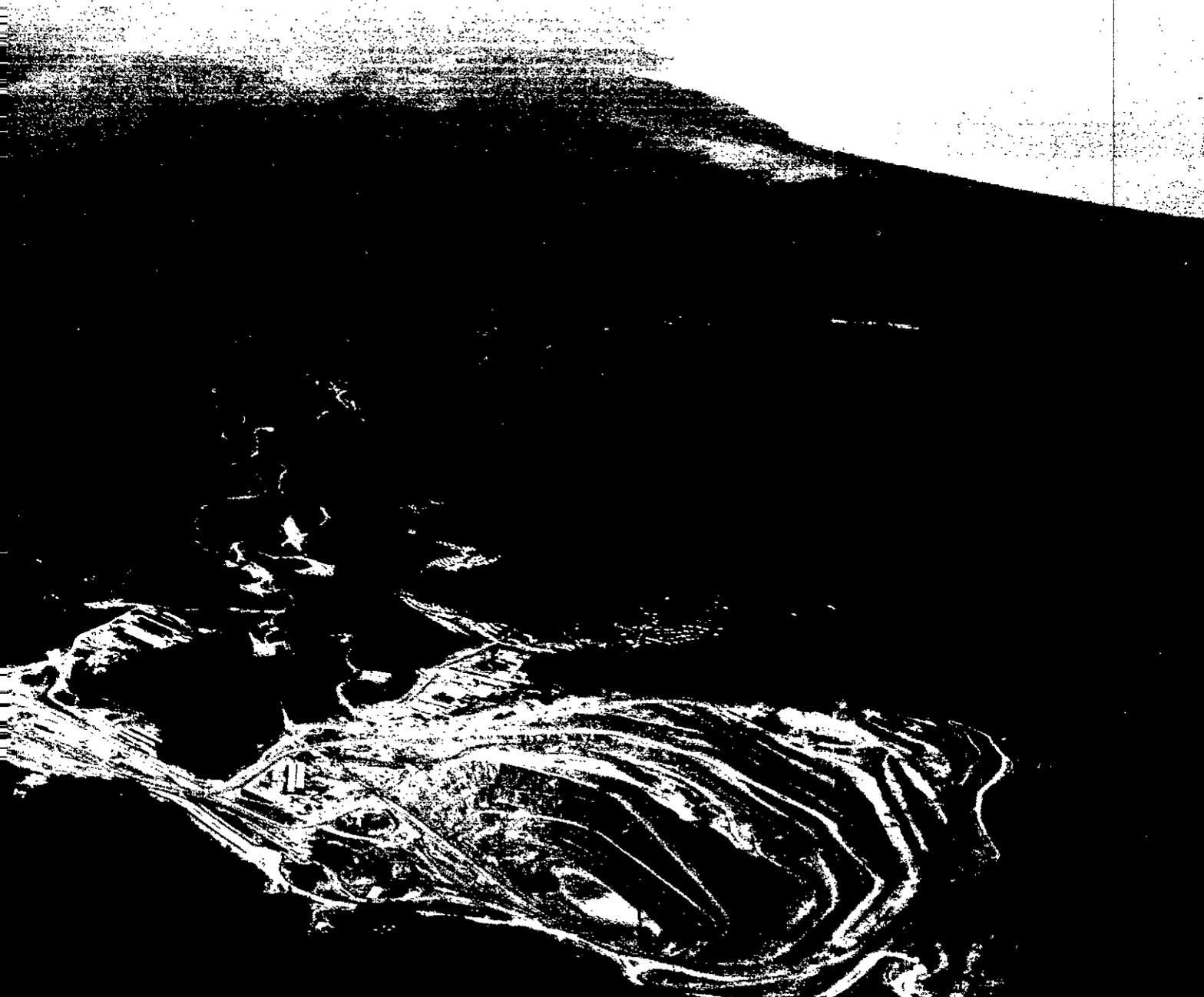
**December:**

Ball mill utilization reached a record annual average of 98.5%

Material mined during the year of 79.8 million tonnes was the highest on record.

The kina reached US\$1.55 and A\$1.32, the highest values since the introduction of the currency.

Copper price fell to US79c/lb, the lowest price for the year.



# Chairman's Statement

The Company's net earnings in 1980 were K71.5 million. This result was K12.4 million, or 14.8% below the 1979 result. Last year marked a significant decline in concentrate production combined with a continuing substantial increase in operating costs. The impact of these trends on profits was partially offset by an improvement in metal prices. Prices, however, are traditionally volatile and, as ore grades decline and cost inflation continues, the Company will be in a less favourable position to withstand periods of low prices.

During the year, the written down value of assets was increased from K325 million to K625 million. An Asset Revaluation Reserve was credited with the amount of the revaluation.

At the 1980 Annual General Meeting the shareholders agreed that part of this revaluation reserve be used to make a 2 for 1 bonus issue of ordinary shares and that the fifty toea shares be consolidated into one kina shares. As a result, the Company now has an issued capital of 401 062 500 one kina shares.

As the Company's assets have been revalued to more realistically reflect their current worth, it is now possible to make a better assessment of the shareholders' return on funds invested. For 1980 this rate of return is 12.2% which is disturbingly low, and given current levels of inflation in Papua New Guinea, returns must be considered inadequate.

Unfortunately the tax system under which the Company operates makes no allowance for inflation. This problem is exacerbated in years such as 1979 and 1980 when the Company paid additional profits tax, even though the return on shareholders' funds was modest when the effects of inflation are taken into account.

This year's Annual Report contains indicative results based on Current Cost Accounting principles. This is considered a more realistic statement of the Company's profitability, particularly in times of significant inflation.

The Company paid an interim dividend in November of eight toea per one kina share. The Directors have declared a final dividend of eight toea per share. The total ordinary dividend of 16 toea per share represents approximately 90% of the Company's net earnings in 1980. As was the case in 1979, the Directors have also decided to pay a bonus dividend out of retained earnings, as dividend payments were restricted in earlier years by the Company's loan agreements. The amount of the bonus dividend is four toea per share. Future dividends will depend principally upon metal prices and inflation — two factors over which the Company has no control — and internal cash flow requirements. It should be recognised, however, that on predicted metal prices, the 1981 earnings are expected to be lower than those in 1980.

In the first half of 1980 the general economic recession resulted in a surplus of oil supplies which caused a weakening in prices. This situation was changed by the Middle East war between Iraq and Iran. Oil supplies have now tightened and spot oil prices have increased. At the OPEC meeting in December the Saudi Arabia "marker price", effectively the official minimum price, was increased to US\$32 per barrel. The Company is totally dependent upon oil based products for its energy supplies — fuel oil for the power station and diesel for the operation of its haul trucks. The Company's oil costs increased by over 50% between 1979 and 1980. Energy costs now represent more than 20% of the Company's direct production costs. Energy cost escalation has been one of the principal causes of the 23% increase in the Company's cost of sales. Under these circumstances the Company is actively studying ways of diversifying its energy sources and is seeking means to resist further inflationary cost pressures.

The volatility of metal prices continued during 1980. Copper started the year at US105c/lb and rose to a peak of US144c/lb in February as a result of speculative pressures. The realities of the economic depression materialised in the second quarter and resulted in a fall in the copper price. It was only because of strikes in the US copper industry that the price held in the US90-100c/lb range during the third quarter. The strike settlement allowed the underlying economic realities to emerge and copper traded in the US80-95c/lb range in the fourth quarter to close the year at US86c/lb. The prospects for copper in 1981 are not promising unless an economic upturn occurs earlier than most forecasters predict.

Speculation took the gold price to a peak of almost US\$850/oz in January. For most of the year, however, gold fluctuated in the US\$500-700 range with variations caused by continuing political uncertainties in Afghanistan, the Middle East and Poland. In November/December US interest rates started to climb and the US prime rate reached a record level of 21½%. This put pressure on the gold price and caused further falls. The price at the year end recovered somewhat to US\$590/oz. The current high US interest rates will militate against any short term recovery in the gold price unless there are further political crises. Silver rose to a peak of US\$49/oz in January largely as a result of speculative activities in the USA. Silver closed the year at US\$15.5/oz.

There was some indication at the year end that US interest rates had peaked and may reduce as 1981 progresses. However, should these high interest rates continue, this should tend to strengthen the US dollar which benefits the Company as all its sales are denominated in this currency. The exchange rate at the start of the year was US\$1.45 to one kina. Appreciation of the kina took the exchange rate at the year end to US\$1.55 to the kina, a record high. While a strong kina helps in containing price escalation on imported supplies, the net effect on the Company's profitability is negative due to the larger impact on sales revenue.

Head grades continued to decline in 1980 as expected with a consequential drop in production levels. This more than offset the gains through increased metal prices. These factors, together with increased operating costs, resulted in a significant reduction in the Company's profitability. To offset the effects of the fall in head grade, the Company has decided to install an eleventh ball mill. Its total cost is estimated at approximately K37 million and it is due to be commissioned in mid-1982. The additional mill should add around 10% to the Company's production capacity.

During the last year potentially serious problems emerged within Papua New Guinea's economy. Inflation has been steadily gathering momentum and the annual rate of increase in the "Consumer Price Index" is now approximately 12%. This inevitably flows through to all sectors of the economy in the form of wage increases. The balance of payments has also been placed under pressure; the first three quarters of 1980 showed a deficit on current account of K83 million, the

equivalent figure for 1979 being a surplus of K52 million. These two factors have caused speculation that the Government might be forced to reconsider its hard kina strategy. However, in the Budget delivered in November, the continuation of the hard kina policy was confirmed. As noted above such a policy will tend to adversely affect the Company's profitability.

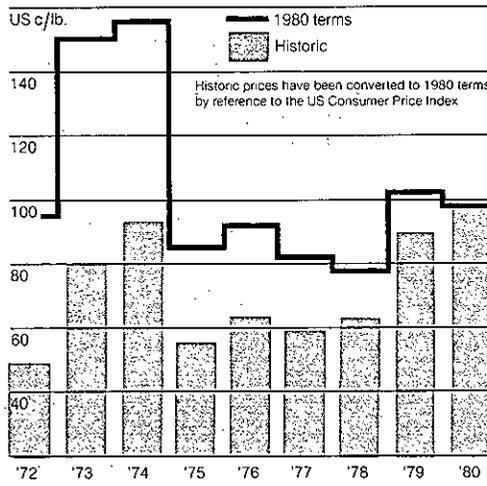
1980 has been a year of political change in Papua New Guinea. At the national level, Sir Julius Chan replaced Mr. Somare as Prime Minister. In the Provincial elections held in June, Mr. Hannett defeated Dr. Sarei and became the new premier for the North Solomons Province.

During 1980 the Company continued to make a significant contribution to Papua New Guinea's economy. The Company's net sales were an estimated 57% of the country's total exports in 1980. Payments to the Government in the form of dividends, taxes (excluding those on salaries and wages) and royalties amounted to K81 million. Taxes on wages and salaries indirectly contributed a further K7 million. The Government's planned expenditure for 1981 is K694 million.

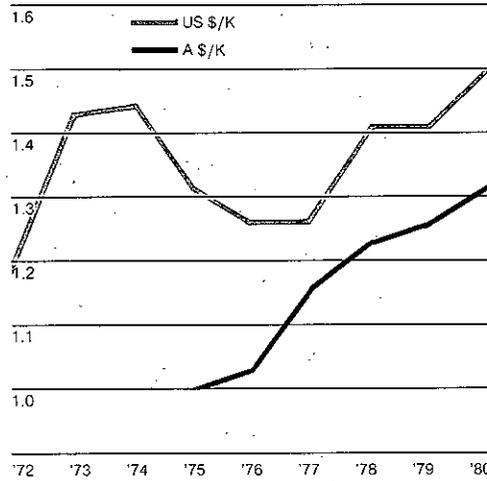
The magnitude of this contribution to the country's economy makes it important that the Company's orderly development is efficiently planned. Current ore reserves are estimated to last until the end of this century. However, given the extremely long lead times involved in locating, exploring and developing new ore bodies, it is essential that the present restriction on the Company's ability to explore outside its current lease be relaxed as soon as possible. If this is not done it may not be possible to make optimum use of the infrastructure already developed on Bougainville Island. Discussions are currently continuing with both National and Provincial Governments and the Company is hopeful that the position may change in the near future.

The Company continues to emphasise the employment and training of Papua New Guinea Nationals at all levels of management as part of its localisation programme. The speedy recruitment of skilled staff is of great importance to the efficient operation of the Company. The recent introduction of the Employment of Non Citizens Act has been causing a number of problems for the Company in its recruitment of overseas personnel. The procedures involved in obtaining work permits and visas have become extremely protracted. Unless this situation improves in the near future it is likely that the efficiency and profitability of the Company's operation will be adversely affected.

Copper prices 1972-1980



Exchange rates 1972-1980

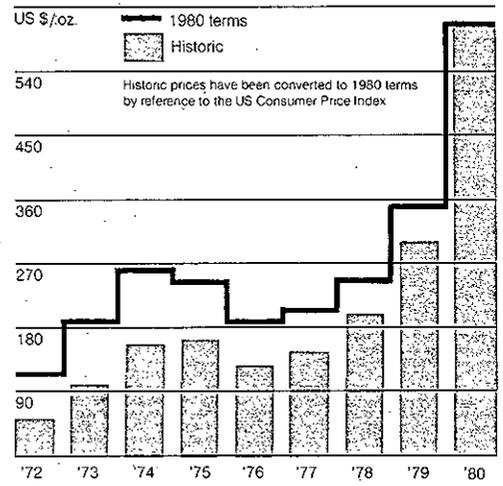


The Bougainville Copper Agreement, as amended in 1974, provides for reviews of the Agreement's operation at seven year intervals. The first of these reviews is due in 1981. There are a number of issues that the Company wishes to discuss with the Government covering topics such as taxation, including the impact of inflation, and exploration. The resolution of these problems would enable the Company to enter the next decade with greater confidence and certainty with regard to its future.

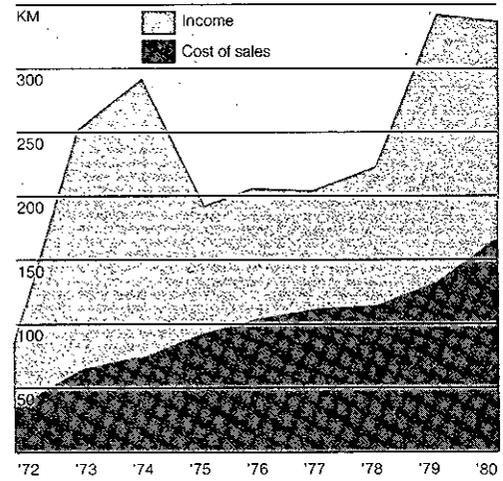
The Directors would like to take this opportunity to pay tribute to the dedication of all its employees and thank them for their efforts over the past year. Their work has enabled the Company to maintain its now customary high level of efficiency. This year we have taken the occasion of the Annual Report to feature four of them.

D. C. Vernon, Chairman  
10th February, 1981

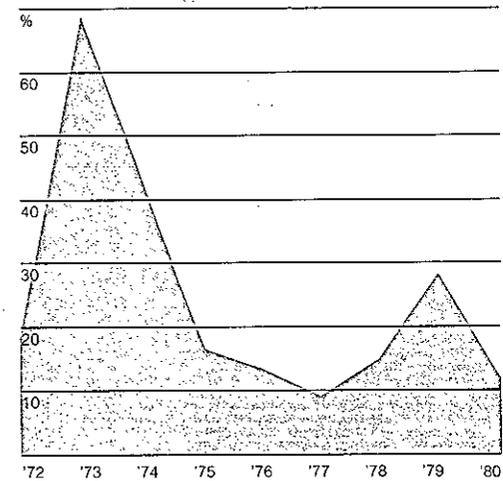
Gold prices 1972-1980



Income/cost of sales 1972-1980



Return on shareholders' funds 1972-1980



# Review of Operations

## Measured Ore Reserves:

Measured ore reserves at the end of 1980 were estimated at approximately 650 million tonnes, averaging 0.43% copper and 0.48 grams of gold per tonne of ore.

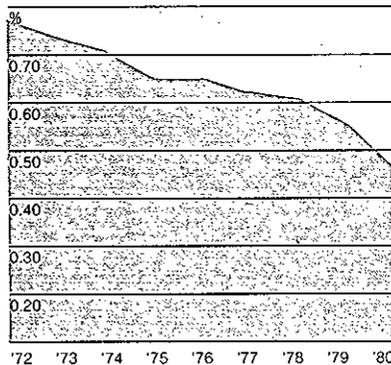
A geostatistical model of the orebody is currently being developed using the same diamond drilling data as was used for the original calculation of ore reserves. It is expected that this model will give a more accurate interpretation of the orebody than the original models, but preliminary indications are that there will not be major changes. After auditing of the model by the Company's consultants, it is intended to review the measured ore reserves in 1981.

## Production:

Production statistics were as follows:

	Year Ended 31/12/80	Year Ended 31/12/79
Material mined (millions of tonnes)		
Ore	37.6	36.2
Waste	42.2	39.8
Waste/Ore ratio	1.12/1	1.10/1
Ore grade		
Copper (per cent)	0.46	0.55
Gold (grams/tonne)	0.50	0.75
Silver (grams/tonne)	1.47	1.70
Concentrate produced (dry tonnes)	510 397	584 692
Concentrate grade		
Copper (per cent)	28.8	29.2
Gold (grams/tonne)	27.5	33.7
Silver (grams/tonne)	72.2	76.3
Contained metal in concentrate		
Copper (tonnes)	146 813	170 788
Gold (kilograms)	14 050	19 703
Silver (kilograms)	36 856	44 640

Copper ore grade 1972-1980



## Mine:

During 1980 the major mining activity continued to be concentrated on the northern and eastern sides of the pit. Pit depth was increased by 30 metres during the year to 445 metres above sea level. Pit depth is not expected to be increased further until the completion of the pit gravity drainage tunnel in 1982.

A total of 37.6 million tonnes of ore and 42.2 million tonnes of waste was mined during the year. This is a slight increase over the previous year.

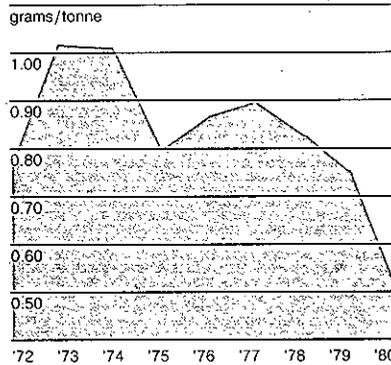
Ore grades continued to decline as mining advanced into the lower grade areas on the periphery of the orebody. Average grades were 0.46% Cu (0.55% in 1979) and 0.50 grams per tonne of gold (0.75 grams per tonne in 1979). The decline in grade is expected to continue in future years but at a reduced rate.

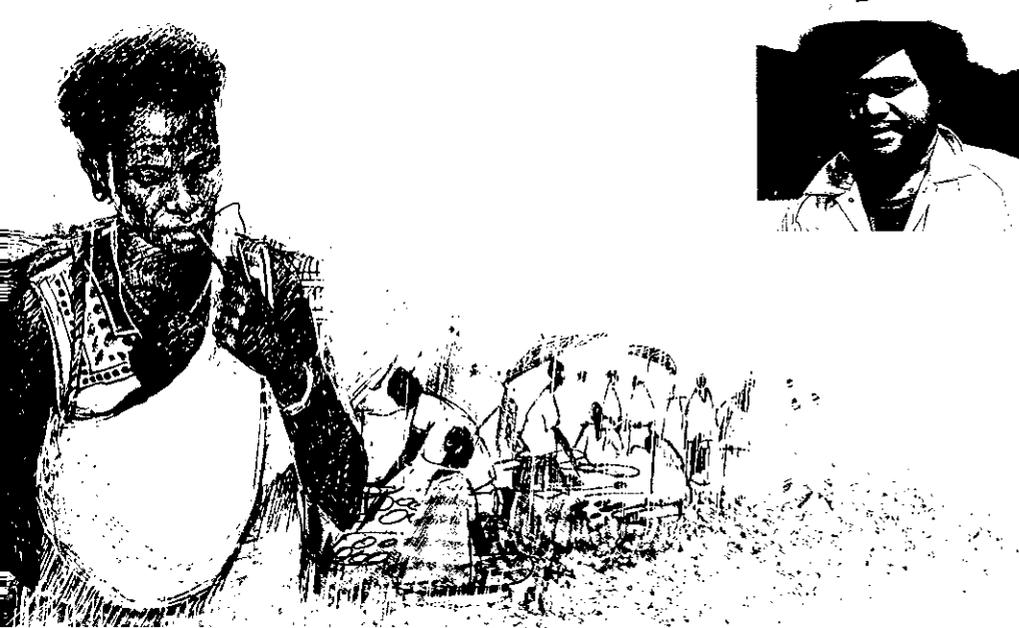
Availability and performance of major mining equipment continued at the high levels achieved in 1979.

During the year investigations were commenced into the possibility of reducing diesel fuel consumption by the haul truck fleet. These investigations cover areas of fuel efficiency and external electrical assistance to the electric wheel drive haul trucks.

Construction of the 6 400 metre tunnel for gravity drainage of the pit continued and at year end had advanced to 4 420 metres from the portal. Progress was hampered by difficult ground conditions in the first half of the year.

Gold ore grade 1972-1980





**LUKE LOLOWA**  
Luke Lolowa is a driver of the 155 tonne haul trucks. He has worked for the company for over 7 years, first in the Concentrator

*Division and then in the Mining Division. Luke comes from Tung Village on the west coast of Buka Island which is just to the north of Bougainville Island.*



**MICHAEL LUAKENU**  
Michael Luakenu is a computer operator in the Company's Technical Services Division. He joined the Company in 1972 and has worked in several

areas before joining the Computer Department in 1976. Michael comes from Luaguo Village, Buin which is at the south end of Bougainville Island.





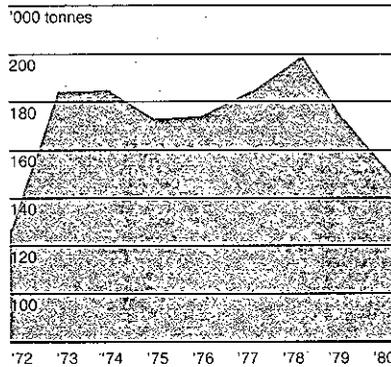
**Concentrator:**

The Concentrator treated 37.6 million tonnes of ore, compared with 36.2 million tonnes in 1979. The increase in throughput resulted from improved plant utilisation, the operation of the ball mills at higher average treatment rates and a finer mill feed. Plant utilisation during 1980 was the highest achieved since the commencement of operations and reflects considerable improvements in mechanical availabilities.

Production for the year was 510 397 tonnes of concentrate containing 146 813 tonnes of copper, 14 050 kilograms of gold and 36 856 kilograms of silver. Production of concentrate was below the 1979 level of 584 692 tonnes. The lower copper production reflected a combination of the reducing ore grades and lower metal recoveries from the treatment of oxidised ores mined from recently developed areas of the pit. The considerably lower gold production was a direct result of disproportionately lower gold head grades.

The programme, commenced in 1979, to replace secondary crushers with extra heavy duty units will be completed early in 1981. Engineering for the installation of an eleventh ball mill and associated equipment is well advanced. This mill is expected to be commissioned in mid-1982 with the resulting increased copper and gold production offsetting the effect of falling head grades.

Production of contained copper 1972-1980



**Technical Services:**

Over the past 12 months a large civil works programme has been in progress aimed at minimising the risk of flood damage both to the Panguna townsite and the mine service areas. Associated with this river control work has been the construction of the concrete lined North Channel extension. This extension will ensure that the Kawerong River is carried safely across the top of the waste dumps and is discharged downstream of the ultimate dump limit. Because of the channel extension it now becomes feasible to reroute the public road, from Panguna to Jaba, around the edge of the pit. The entire programme is scheduled for completion in early 1981.

During 1980 a new high level section of the Jaba Pump Station road, 6 kilometres long, incorporating a relocated Jaba water line, was opened to traffic. This will reduce the risk of interruption to Concentrator operations resulting from flood conditions that have, in the past, made both the pump station and the pipe line inaccessible.

Following the commissioning in 1982 of the eleventh ball mill the generating capacity of the power station will act as a constraint on production. Feasibility studies have been carried out during the past year to identify and cost the options available for power station expansion using either coal or oil as fuel. Further investigation of the alternatives is continuing.

**Operating Costs:**

Inflationary cost pressures were again evident during the year. The rate of cost inflation experienced by the Company is in excess of general levels of inflation mainly due to dependence on oil based products as the Company's source of energy. Energy costs account for an increasing proportion of total operating costs and are now more than 20% of direct production costs. Oil prices have doubled over the past two years.

Maintenance expenditure is the single largest cost item and continues to increase with the ageing of plant. High equipment availability is necessary to ensure maximum production levels at a time of falling ore grades.

These inflationary pressures have resulted in the Company's cost of sales increasing from K135 million in 1979 to K167 million in 1980 — a rise of 23%. Lower production of concentrate, combined with cost inflation, has increased the unit cost of sales by 46%.



### Marketing:

During the year, the Company shipped 494 422 dry tonnes of concentrate containing 142 240 tonnes of copper, 13 687 kilograms of gold and 35 719 kilograms of silver. With the exception of two small shipments to China, concentrate deliveries were directed towards meeting the Company's obligations under the original long term contracts with buyers in Japan, West Germany and Spain.

The annual average copper price for 1980 was the equivalent of US 99c/lb, which kept pace with inflation when compared with the average price for 1979 of US90c/lb. However, the copper market encountered significant fluctuations during 1980 with the price reaching a peak of US144c/lb in a speculatively fuelled metal price surge in February and falling briefly below US80c/lb in December as the effects of US interest rate increases unsettled metal markets.

Precious metal prices also recorded marked fluctuations during 1980, reflecting the volatile nature of economic and political events during the year.

The gold price reached a peak of US\$846/oz. in January as a result of speculation triggered by the political problems in Iran and Afghanistan. The lowest price recorded during the year was US\$478/oz. in March, and the 1980 annual average price recorded on the London Gold Market was US\$615/oz. compared to US\$305/oz. in 1979.

Silver largely reflected the performance of gold, though it was further influenced by a severe disruption to silver futures trading during March. From a peak of almost US\$50/oz. in January, the silver price fell below US\$11/oz. in May, before returning to the US\$15-25/oz. range. The annual average price for silver on the London Market was US\$21/oz. (US\$11/oz. in 1979).

The "hard kina" policy followed by the Papua New Guinea Government over recent years was reinforced during 1980. This gradual strengthening of the kina was particularly significant in respect of the US dollar/kina exchange rate which recorded an effective appreciation of the kina of almost 7% during the year. The resulting reduction in revenue outweighed any benefits the Company derived through cheaper imports.

### Finance:

Total loan payments during the year amounted to K11.6 million in principal and K3.5 million in interest. The year end loan balances totalled K30.3 million.

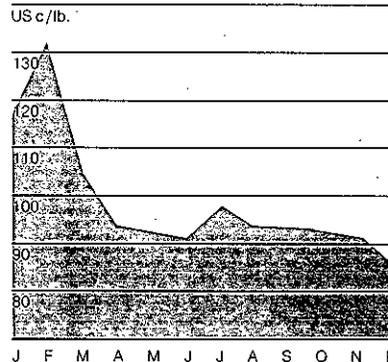
The commencement in August of a Treasury Bill auction system in Papua New Guinea has allowed the Company to invest short term kina funds more profitably while retaining liquidity. The Treasury Bill market represents a significant and welcome development in the capital market in Papua New Guinea.

### Personnel:

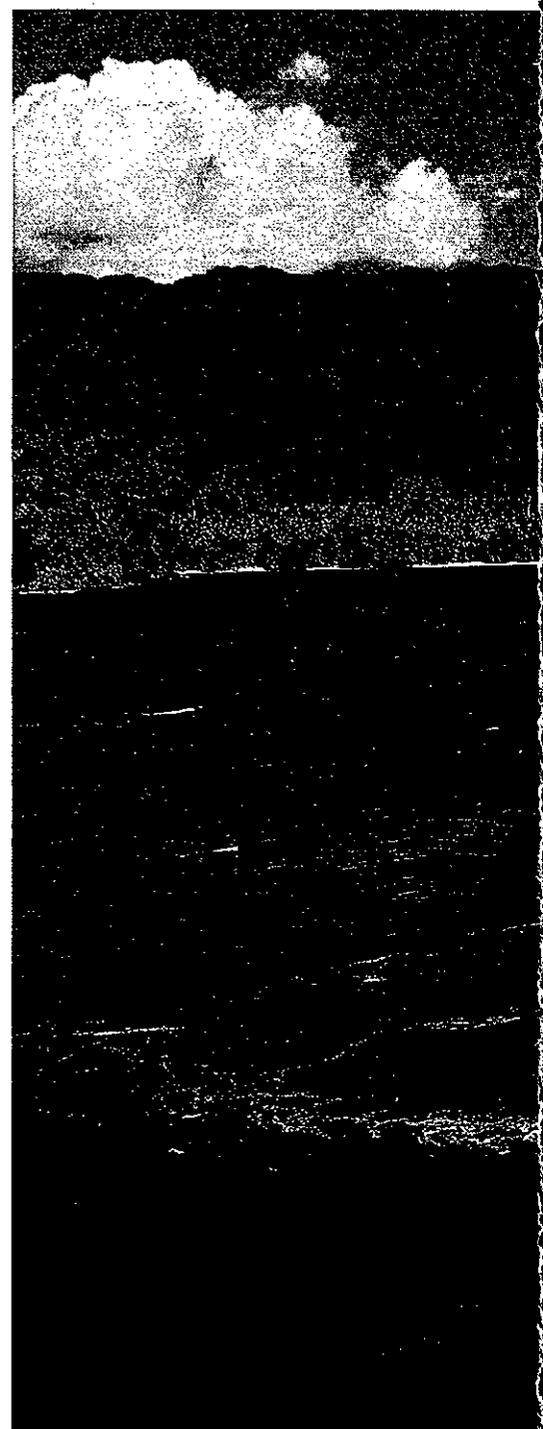
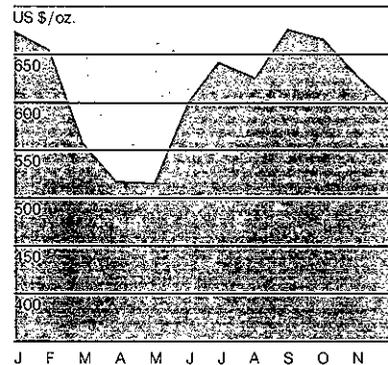
At the end of 1980 the Company's total manpower was 4 293 of which 3 416 were Papua New Guinea Nationals.

During 1980 the Manpower Plan exercise, started in 1979, was completed and a manpower strategy produced to set targets for overall establishment levels and for National recruitment and training for the period 1981-1985. In addition, an innovative staff development system has been formulated that allows an individual to self regulate

Monthly average copper prices 1980



Monthly average gold prices 1980





**NUKUMURI SIONE**  
Nukumuri Sione is the Tugmaster of the "Masthead" — the Company's tug. He has been with Bougainville Copper for three years.

*Nukumuri comes from the Mortlock Islands some 120 miles north east of Bougainville.*



**JULES POWELL**  
Jules Powell  
supervises the  
Company's  
environmental  
research in the field  
of marine biology.  
He joined the  
Company in 1975 to

examine the  
biological and  
chemical aspects of  
marine tailings  
disposal. Jules  
obtained his M. Sc.  
from the University  
of Queensland.





and measure his progress towards more senior levels in the organisation.

In order to comply with the Employment of Non Citizens Act information prepared from the manpower strategy has been forwarded to the Department of Labour and Industry as the Company's Training and Localisation Plan. From 7 February 1981, work permits will be issued to non citizens only for positions in the organisation approved by the Government.

Training of National employees continues to play a significant part in the commitment to the Company's localisation programme. In 1980, 21 new National graduates joined the Company making a total of 77. In addition, there are 34 Bougainville Copper undergraduates still to complete their courses.

In 1980, 82 apprentices secured their indentures; at the end of the year 267 apprentices remained in the training stream. Apprenticeships are offered in 17 trades.

Undergraduate and post-graduate training was undertaken by five Nationals in Australian institutions.

Under the terms of the Bougainville Copper Agreement, the Government is responsible for the provision of satisfactory community health, education and police facilities. However, the Company has found it necessary to progressively increase its role in

community support activities. The Company has given notice to the National and Provincial authorities that it wishes to review both the standards of these services and the responsibility for their operation.

**Environmental:**

Investigations into the long-term effects on the environment of tailings disposal continued as a major research programme.

During 1980, agreement was reached with the customary landowners of lease held land on the levels of compensation to be paid over a five year period. Both National and Provincial Governments participated in negotiations and contributed to the formalisation of the Agreement.

**Exploration:**

The governmental restriction on mineral exploration on Bougainville Island remained in force during the year. The drilling programme in the north east corner of the Special Mining Lease was completed; results indicate no extension of the ore body. A programme of diamond drilling to test the grade of mineralisation below the present planned pit bottom continued through the year. Results of this programme will be assessed during 1981.

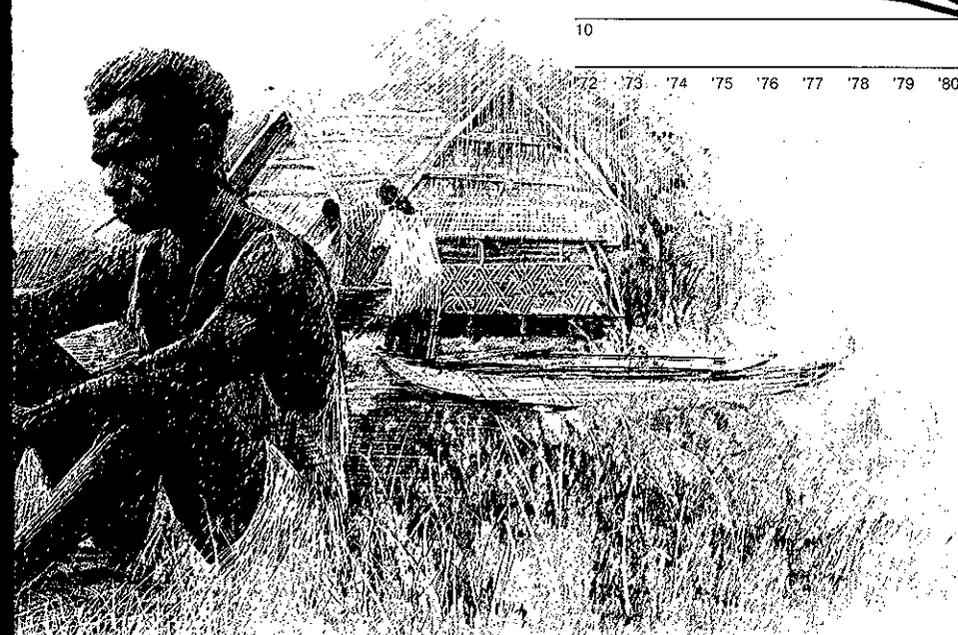
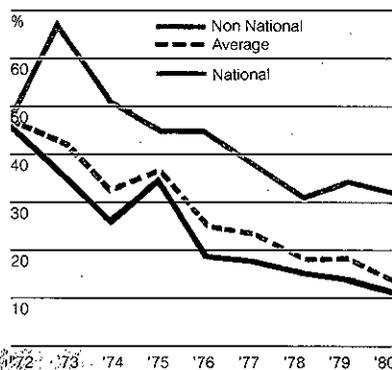
**Capital Expenditure:**

Capital expenditure for the year totalled K31.6 million.

The relocation of roads, pipeline and power reticulation in the Lower Kawerong Valley continued at a cost to date of K4.8 million.

A further K2.8 million was expended on the pit drainage tunnel during the year; the total cost so far being K8.4 million. The extension to the North Channel drainage system cost an additional K1.8 million bringing the total to K7.2 million. Additional accommodation cost K3.4 million.

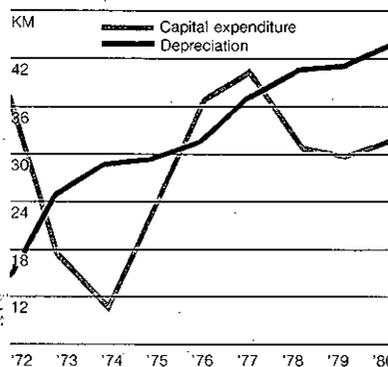
Annual labour turnover 1972-1980



*P. W. Quodling*

P. W. Quodling, General Manager.  
10th February, 1981.

Capital expenditure & depreciation 1972-1980



# Gold mining in Papua New Guinea



14 oz nugget, Sandy Creek, Wau.  
(Courtesy P. L. Lowenstein)



Gold mining, Kupei, Bougainville Island.

## Introduction

The relatively short history of the Bougainville project has coincided with a period of dramatic upheaval in the gold price, causing a major reappraisal of the role of gold both in the operational and commercial activities of the Company and to the economic well-being of Papua New Guinea.

For the Company, the significance of gold has grown from that of a useful by-product during the feasibility study and construction of the project, to that of a co-product with copper in recent years. For Papua New Guinea, gold has become a valuable component of the nation's exports, helping to diversify the export base of the economy.

## New Guinea Goldfields

The rumours emanating from early explorers that New Guinea would prove a rich source of gold were given some basis in 1852 by the observations of Dr. John MacGilluray, when he found traces of gold at Redscar Bay in the present Central Province. Subsequently, in 1873 Captain Moresby located further traces of gold near Fairfax Harbour, around which the nation's capital, Port Moresby, is now located. These rumours attracted a number of prospectors, some being disappointed miners from the Australian goldfields. By the 1890's the islands of the Louisiade Archipelago supported several hundred miners and gold constituted the major export from what was then British New Guinea.

In 1922 gold was discovered on the Watut River, causing an upsurge in prospecting in the Watut/Bulolo River system. This effort was

rewarded by an extremely rich strike of alluvial gold at Edie Creek near Wau in 1926. These discoveries soon attracted large-scale interests in the Bulolo/Wau area. By 1930, companies such as Bulolo Gold Dredging and New Guinea Goldfields were implementing major projects in the area.

The dredging operation of Bulolo Gold Dredging exploited the deep alluvial reserves along the Bulolo and Wau valleys. Eight dredges were eventually constructed, the two largest weighing 2,500 tonnes each. These huge dredges recovered more than 62,000 kilograms of gold before the last one ceased operating in 1965. A notable feature of the development of the Wau/Bulolo goldfields was the extensive use of air transport. Bulolo Gold Dredging, operating three Junkers G31, airlifted some 40,000 tonnes of cargo in Bulolo between 1931 and 1942 without a single serious accident. This demonstrated the viability of large scale air transport and can be considered as a milestone in aviation history.

New Guinea Goldfields continues to operate in the Wau/Bulolo area and the rising price of gold has attracted many of the local villagers to work alluvial occurrences with simple panning and sluicing methods. The output from these operations varies, but normally ranges between 500-800 kilograms per year.

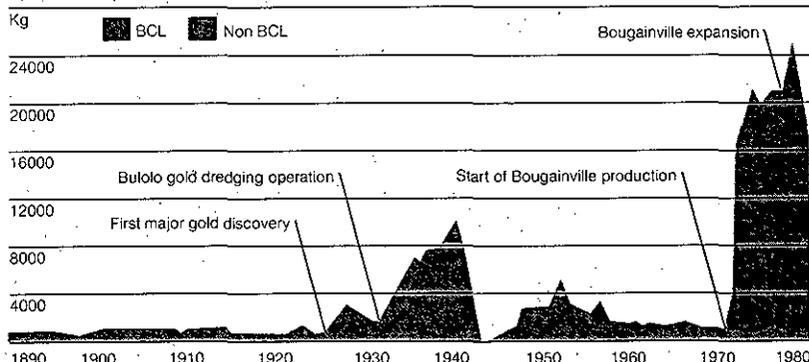
## Gold on Bougainville

Prospectors Jack Comb and Bob Palmer discovered gold in the dense rainforest of the Crown Prince Range at Kupei in 1929. A small mine was established there as well as others at nearby Moroni, Panguna and along the Kawerong River. However, the gold was difficult to win from the copper ore due to its complex metallurgy. Mining at the Kupei fields therefore tapered off in the late 1930's.

When the initial evaluation of the Panguna orebody was undertaken, the presence of gold in the ore, although in only small quantities, was recognised as a substantial benefit to the viability of the proposed large tonnage copper mining operation. Despite the low grade of gold in the ore, the massive scale of mining operations results in Bougainville Copper being ranked high on the list of the world's gold producers. In fact the mine on Bougainville is the largest single gold source in the non-Communist world outside of South Africa. Gold production for 1980 was 14,000 kilograms; total production of gold since the commencement of operations in 1972 has amounted to 171 tonnes.

Coincidentally with the commencement of production in 1972, the price of gold — which had been held at US\$35.00/oz. since 1934 — was effectively thrown open to free market forces. As a result the price has increased dramatically, though erratically, to reach a high point of US\$848/oz. in January 1980. This unparalleled rise in the price of gold has been reflected in the contribution that gold has made to the gross revenue of the Company. From a level of 16% in 1972, the first year of the Company's

PNG gold production 1890-1980 (Figures from P. L. Lowenstein (courtesy Department Minerals & Energy))



production, the contribution of gold increased to 46% of the Company's gross revenue in 1980. Thus from the status of a by-product when the mine was first conceived and brought into production, gold has developed to a position of almost equal importance with that of copper.

**A national asset**

Papua New Guinea has emerged as one of the world's major gold producing countries. In 1980 Papua New Guinea — with an estimated production of some 14,600 kilograms of gold — ranks as the sixth largest gold-producing country in the world, behind South Africa, U.S.S.R., Canada, U.S.A. and Brazil.

The impact of gold on Papua New Guinea's economy is particularly significant. The contribution of gold to the total export earnings of the nation has grown from 11% in 1972 to an estimated 26% in 1980, surpassing such traditional exports as coffee, cocoa and copra. Thus, gold has been a major element in the establishment of a stable and diversified export base, which has facilitated the steady development of the economy in the critical period since the nation gained independence in 1975.

**The future**

Papua New Guinea seems destined to continue as a major gold producing nation. The existing ore reserves of the Bougainville mine are sufficient to sustain production well into the 1990's. While the peak level of gold production recorded in 1978 is unlikely to be matched in future years, Bougainville will continue as one of the world's largest gold producing mines for some years to come. In addition there are several other substantial prospects — at Ok Tedi, high in the Star Mountains near the Irian Jaya border; Porgera in the Central Highlands; Frieda River on the Upper Sepik — that appear likely to make substantial contributions to the nation's gold production over the coming decades. These successes are likely to stimulate further exploration efforts throughout the country and ensure gold a permanent position in the future of Papua New Guinea.

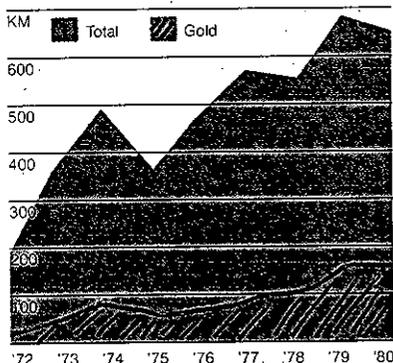


Sluicing, lower Edie Creek.  
(Courtesy P. L. Lowenstein)

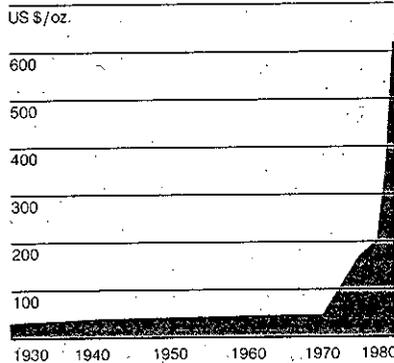
Panning for gold.

Top: Early drilling, Bougainville Island.

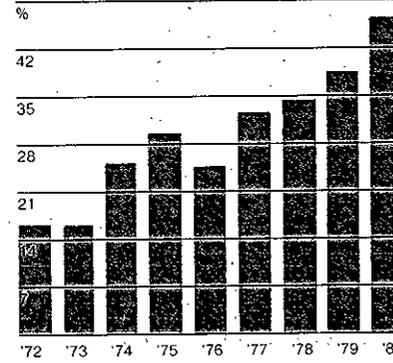
PNG exports 1972-1980



Gold prices 1930-1980



Gold as a percentage of Bougainville Copper gross revenues 1972-1980



# Simplified Financial Statements

Bougainville Copper Limited

## Earnings Statement

Income: K341m.

K mill.

K mill.

Expenses: K341m.

Sales and other income	341		
		170	Cost of sales
		44	Depreciation
		55	Taxation and royalties
		72	Net earnings

## Balance Sheet

Funds employed: K759m.

K mill.

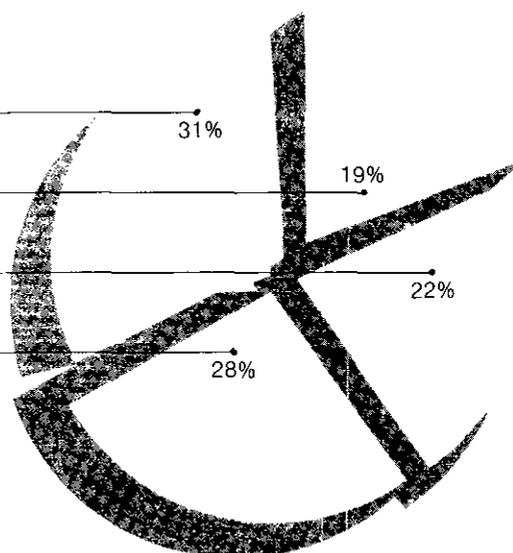
K mill.

Assets: K759m.

Shareholders' funds	585	611	Net investment in property, plant and equipment
Potential exchange gains on future loan repayments	15		
Borrowings	30	56	Stocks and stores
Amount owed to creditors and for income tax	91	76	Amount owed by debtors
Dividends payable	48	16	Cash at bank

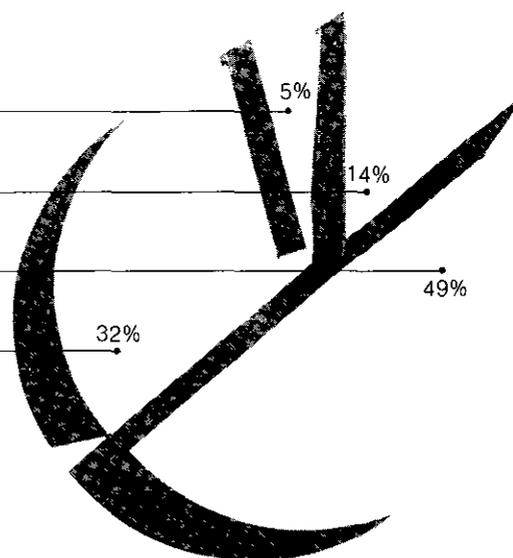
# Source & application of funds

Source of funds	1980 K mill.	1979 K mill.
Net earnings	71.5	83.9
Depreciation	43.8	40.7
Provision for income tax	51.2	77.9
Decrease in working capital	63.4	—
Other	1.6	4.7
Total from operations	231.5	207.2
Loans (long term)	—	3.2
Exchange gains on financing	(2.6)	(3.5)
	228.9	206.9



## Application of funds

Loan repayments (long term)	11.6	21.0
Capital expenditure	31.6	29.4
Dividends paid	112.3	53.5
Income tax paid	73.4	23.1
Increase in working capital	—	79.9
	228.9	206.9



# Statement of Value Added

A country's economy is largely made up of the activities of employers and employees and the contribution they make to that economy is known as the Value Added.

The conventional earnings statement does not reflect the contribution that Bougainville Copper makes to Papua New Guinea's economy. The economic activity is represented by the sales

generated during the year less the cost of goods and services brought in from outside the Company.

The following statement shows the contribution made by the Company and its employees during the last two years. The total Value Added was distributed to employees, governments, shareholders and lenders of capital, with part being retained for future use within the Company.

## Value added

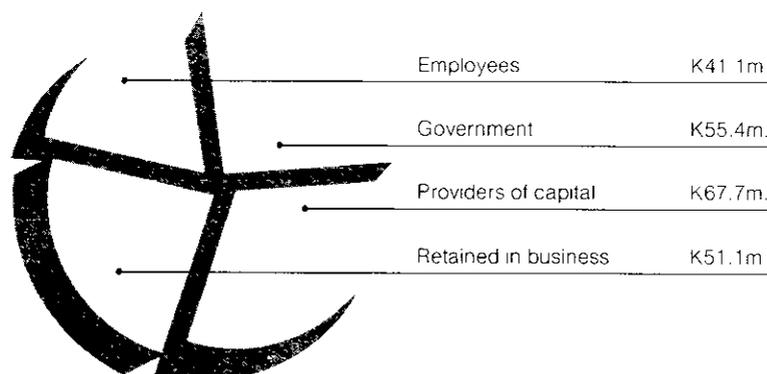
	1980 K mill.	1979 K mill.
Sales made to external customers	335.1	339.7
Less: Materials and services brought in from outside the Company	125.9	99.5
	<u>209.2</u>	<u>240.2</u>
Add: Other income	6.1	6.9
Total Value Added available for distribution	<u>215.3</u>	<u>247.1</u>

## Distribution

Wages, salaries and benefits to EMPLOYEES	41.1	35.8
Taxation and royalties to GOVERNMENT	55.4	82.2
To PROVIDERS OF CAPITAL		
Dividends to shareholders	64.2	80.2
Interest to lenders	3.5	4.5
RETAINED in business to provide for asset replacement, expansion and protection of the Company and its employees in less favourable times.		
Depreciation	43.8	40.7
Retained earnings	7.3	3.7
Total Value Added distributed	<u>215.3</u>	<u>247.1</u>



Sales & other income for the year was K341.2m. — Less materials & services K125.9m. = Equals total value added K215.3m.



And this is how total value added was made up.

# Directors' Report

The directors of Bougainville Copper Limited present their report on the audited financial statements of the Company and its subsidiary for the year ended 31 December, 1980.

## Directors:

The directors of Bougainville Copper Limited at the date of this report are:

D. C. Vernon (Chairman)

N. R. Agonia

J. L. Auna

Sir Roderick Carnegie

Sir Frank Espie, O.B.E.

R. H. Harding

P. W. Quodling

J. T. Ralph

Mr D. C. Vernon and Mr. N. R. Agonia retire in accordance with the Company's Articles of Association and, being eligible, offer themselves for re-election.

## Activities:

Bougainville Copper Limited has produced concentrate containing copper, gold and silver from a mine at Panguna, North Solomons Province, since 1972. Its subsidiary, Bougainville Copper Finance N.V. is incorporated in the Netherlands Antilles for fund raising purposes. No change in the activities of the group occurred during the year.

## Net earnings:

The net earnings of Bougainville Copper Limited and its subsidiary for 1980 totalled K71 534 000 after providing K43 841 000 depreciation and amortisation, K4 177 000 for royalties and K51 179 000 for income tax.

## Taxation:

Taxation of K51 179 000 charged to earnings comprises K39 613 000 ordinary tax and K11 566 000 additional profits tax. The additional tax is levied when taxable income exceeds a certain level. For 1980 the level at which additional tax applied is K89 210 000.

## Subsidiaries:

No subsidiaries were acquired or disposed of during the year. No dividends were paid by Bougainville Copper Finance N.V.

## Share Capital:

On 7 February, 1980, the directors revalued the Company's buildings, plant and machinery by K300 000 000. The amount of the revaluation was transferred to an Asset Revaluation Reserve.

At the Annual General Meeting held on 16 April, 1980 the shareholders agreed that, on 17 April, 1980 the authorised capital of the Company be increased to K425 000 000 by the creation of 580 000 000 new ordinary shares of 50 toea each. They also agreed that, on 23 April, 1980, K267 375 000 of the Asset

Revaluation Reserve be applied to fully paying up 534 750 000 unissued 50 toea shares to be issued in the proportion of two ordinary shares for each ordinary share held. They further agreed that on 23 April, 1980 the whole of the capital of the Company be consolidated and divided into ordinary shares of one kina each. As a result of these changes the Company's authorised capital at 31 December, 1980 was 425 000 000 ordinary shares of one kina each of which 401 062 500 ordinary shares of one kina each were issued and fully paid up.

## Exchange Fluctuations:

Exchange gains of K1 843 000 were realised on the repayment of U.S.A. and Australian dollar loans. Exchange gains of K730 000 arose on the translation of overseas bank balances. These gains were included in 1980 earnings.

## Long Term Loans:

No draw downs were made during the year against long term loan arrangements. Repayments of K11 625 000 were made against existing loans, leaving a balance outstanding at the end of the year of K30 314 000.

## Dividends:

An interim dividend of eight toea per share was declared on 14 August, 1980 and paid on 6 November, 1980. A final dividend of eight toea per share has been declared and is payable on 7 May, 1981. In addition, a bonus dividend of four toea per share has been declared and is payable on 7 May, 1981. Withholding tax is deducted from dividends where required by the Chief Collector of Taxes.

## Auditors:

The retiring Auditors, Coopers & Lybrand, being eligible, offer themselves for re-appointment.

## Statutory Information:

In accordance with the provisions of Section 162 of the Papua New Guinea Companies Act 1963, as amended to date, the directors state that:

1. In their opinion, the results of the group's operations in the year under review have not been materially affected by items of an abnormal character except as mentioned in this report.
2. In their opinion, the current assets will realise at least the value at which they are shown in the accounts and that the value is an amount that these current assets might reasonably be expected to realise in the ordinary course of business.
3. No circumstances have arisen which render adherence to the method of valuation of assets or liabilities misleading or inappropriate save and except that on 7 February, 1980 they revalued

certain of the fixed assets of the Company (being buildings, plant and machinery) by K300 000 000 to reflect more realistically the invested capital in these assets. Prior to this revaluation all fixed assets were valued at historical cost less accumulated depreciation and amortisation.

4. No contingent liabilities have arisen since the balance date of the group accounts, 31 December, 1980, and the date of this report, 10 February, 1981.

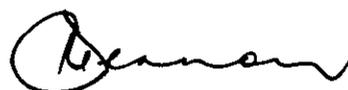
5. No contingent liabilities have become enforceable or are likely to become enforceable within twelve months from the date of this report which will materially affect the group in its ability to meet its obligations as and when they fall due.

## Additional Information:

The directors also state that:

1. They took reasonable steps before the statements of earnings and balance sheets were made out to ascertain what action had been taken so far as debts owing to the Holding Company were concerned in relation to the writing off of bad debts and the making of provisions for doubtful debts and are satisfied that there were no bad debts and that a provision for doubtful debts of K50 000 was adequate.
2. They are not aware of any circumstances which would render the amounts written off for bad debts or the amounts of the provision for doubtful debts inadequate to any substantial extent.
3. Since the end of the financial year, no charge on the assets of either of the companies in the group has arisen which secures the liability of any other person.
4. They are not aware of any circumstances not otherwise dealt with in this report or group accounts, which would render any amount stated in the group accounts misleading.
5. No item, transaction or event of a material and unusual nature has arisen in the interval between the end of the financial year and the date of this report, which in the opinion of the directors of Bougainville Copper Limited, is likely to substantially affect the results of the operations of the group in 1981.

Signed this 10th day of February, 1981 in accordance with a resolution of the directors of Bougainville Copper Limited.



D. C. Vernon (Chairman)



P. W. Quodling (Director)

# Statements of Earnings

Bougainville Copper Limited  
and Subsidiary Company

year ended 31 December, 1980

	Notes	Consolidated		Bougainville Copper Limited	
		1980 K'000	1979 K'000	1980 K'000	1979 K'000
<b>Income</b>					
Net sales revenue		335 140	339 706	335 140	339 706
Other income		3 522	3 358	3 522	3 358
		<u>338 662</u>	<u>343 064</u>	<u>338 662</u>	<u>343 064</u>
<b>Costs and expenses</b>					
Costs of sales, general and administration expenses		166 958	135 267	166 958	135 267
Depreciation and amortisation	3	43 841	40 730	43 841	40 730
Royalties		4 177	4 257	4 177	4 257
Interest		3 546	4 538	3 546	4 538
		<u>218 522</u>	<u>184 792</u>	<u>218 522</u>	<u>184 792</u>
<b>Earnings from operations</b>					
Net exchange gains	7	2 573	3 545	2 573	3 545
<b>Earnings before taxation</b>					
	2	122 713	161 817	122 713	161 817
Income tax	4	51 179	77 900	51 179	77 900
<b>Net earnings for year</b>					
Add:		71 534	83 917	71 534	83 917
Retained earnings brought forward		160 844	183 877	160 847	183 880
		<u>232 378</u>	<u>267 794</u>	<u>232 381</u>	<u>267 797</u>
Less:					
Bonus dividend from retained earnings		16 043	26 737	16 043	26 737
		<u>216 335</u>	<u>241 057</u>	<u>216 338</u>	<u>241 060</u>
Less:					
<b>Ordinary dividends</b>					
Interim paid		32 085	26 737	32 085	26 737
Final payable		32 085	53 476	32 085	53 476
		<u>64 170</u>	<u>80 213</u>	<u>64 170</u>	<u>80 213</u>
<b>Retained earnings carried forward</b>					
		<u>152 165</u>	<u>160 844</u>	<u>152 168</u>	<u>160 847</u>

All amounts are expressed in Papua New Guinea kina.  
Rounding off to the nearest thousand kina has been adopted.  
The notes commencing on page 22 form part of these  
accounts and are to be read in conjunction with them.

# Balance Sheets

Bougainville Copper Limited  
and Subsidiary Company

at 31 December, 1980

	Notes	Consolidated		Bougainville Copper Limited	
		1980 K'000	1979 K'000	1980 K'000	1979 K'000
<b>Funds employed by the group:</b>					
<b>Shareholders' funds</b>					
Paid up capital	5	401 063	133 688	401 063	133 688
Retained earnings		152 165	160 844	152 168	160 847
Asset revaluation reserve	6	31 276	—	31 276	—
Total shareholders' funds		<u>584 504</u>	<u>294 532</u>	<u>584 507</u>	<u>294 535</u>
<b>Exchange fluctuation</b>	7	5 054	5 387	5 054	5 387
<b>Long term liabilities</b>					
Loans	8	22 421	33 354	22 421	33 354
Provision for long service leave		3 300	2 850	3 300	2 850
		<u>25 721</u>	<u>36 204</u>	<u>25 721</u>	<u>36 204</u>
<b>Current liabilities</b>					
Loans	8	7 893	10 094	7 893	10 094
Creditors	9	33 141	22 994	33 139	22 992
Income tax		54 829	77 099	54 829	77 099
Dividends payable		48 128	80 213	48 128	80 213
		<u>143 991</u>	<u>190 400</u>	<u>143 989</u>	<u>190 398</u>
<b>Total funds</b>		<u>759 270</u>	<u>526 523</u>	<u>759 271</u>	<u>526 524</u>
<b>These funds are represented by:</b>					
<b>Fixed assets</b>					
Property, plant and equipment	10	610 759	325 459	610 759	325 459
<b>Investments</b>	11	83	83	92	92
<b>Current assets</b>					
Bank balances and short term deposits		16 497	57 113	16 489	57 105
Debtors for sale of concentrate		73 738	96 076	73 738	96 076
Other debtors	12	2 430	3 235	2 430	3 235
Stocks and stores	13	55 763	44 557	55 763	44 557
		<u>148 428</u>	<u>200 981</u>	<u>148 420</u>	<u>200 973</u>
<b>Total assets</b>		<u>759 270</u>	<u>526 523</u>	<u>759 271</u>	<u>526 524</u>

All amounts are expressed in Papua New Guinea kina.  
Rounding off to the nearest thousand kina has been adopted.

The notes commencing on page 22 form part of these  
accounts and are to be read in conjunction with them.

# Notes forming part of the 1980 accounts

Bougainville Copper Limited  
and Subsidiary Company

These notes form part of the accounts and consolidated accounts of Bougainville Copper Limited and should be read in conjunction with them.

## 1. Statement of significant accounting policies

The principal accounting policies adopted in the preparation of the group accounts are stated to assist in a general understanding of the financial statements.

The policies generally comply with Australian accounting standards. They are consistent with those adopted in the previous year unless otherwise stated.

### Cost Convention

The results of operations and financial position of the Company are accounted for under the historic cost convention except that on 7 February 1980, the Directors revalued the Company's buildings, plant and machinery by K300 000 000 effective 1 January 1980.

### Depreciation and Amortisation

Depreciation and amortisation is provided on cost or valuation and charged against income by the straightline method based on the shorter of the estimated useful economic life of the respective asset or the life of the mine. Depreciation commences in the month following commissioning ready for use.

### Amortisation of Borrowing Expenses

Borrowing expenses incurred on loans have been capitalised, with the amount applicable to each loan being amortised over a five year period from the year in which it was arranged.

### Exploration and Development Expenditure

Expenditure on exploration within the mining lease and development is written off or provided against as incurred. Exploration has not been undertaken outside the mining lease.

### Maintenance and Repairs

Expenditure on maintenance and repairs is charged against income as incurred.

### Valuation of Stocks and Stores

Concentrate stocks at year end are valued at direct production cost, which is lower than net realisable value. Cost includes direct materials, services and overheads, but excludes depreciation and indirect overheads. Other stocks and stores are valued on an average cost basis less an allowance for obsolescence.

### Net Sales Revenue

Sales are recognised on shipment of concentrate from Bougainville, when title passes to the buyer. However, final sales value can only be determined from weights, assays, prices, exchange rates and treatment charges applying after a shipment has arrived at its destination. Consequently, estimates are used to determine the net sales revenue of consignments in the period between their shipment and final valuation. The estimates of sales revenue for shipments not due for final valuation until the following year are considered realistic. Any variation from revenue actually realised will be included in the following year's financial statements.

### Taxation

Income tax charged against earnings is calculated on taxable income for the year. Certain items of expenditure, consisting of depreciation, provision for future liabilities, major consumable stock items and operating spares, are deductible for income tax in different periods from which they are charged against earnings. Such timing differences would not materially affect the determination of income tax had it been calculated on earnings before taxation.

### Foreign Currency Conversion

Monetary assets held and liabilities and borrowings due in foreign currencies are converted to Papua New Guinea currency at the rates of exchange ruling at balance date. All other overseas transactions are converted at the rates of exchange applying when they occurred. Unrealised exchange gains on overseas borrowings are held in the Exchange Fluctuation Account and transferred to earnings when realised.

### Subsidiary

The wholly owned subsidiary, Bougainville Copper Finance N.V., is incorporated in the Netherlands Antilles for fund raising purposes. This company has been consolidated in accordance with conventional consolidation principles.

		Bougainville Copper Limited	
Consolidated		1980	1979
1980	1979	K'000	K'000

## 2. Earnings before taxation

Earnings before taxation have been determined after allowing for the following income and expense items:

Income:				
Interest on short term deposits	3 461	3 311	3 461	3 311
Dividends — received from non-related corporation	1	1	1	1
Expenses:				
Interest — on long term loan from subsidiary	—	—	1 299	1 463
— on long term loans and standby facilities	3 546	4 538	2 247	3 075
Provision for doubtful debts (Note 14)	6	25	6	25
Loss on disposal and retirement of fixed assets	625	2 568	625	2 568
Research and development expenditure	1 082	553	1 082	553
Directors' emoluments (Note 15)	12	3	12	3
Auditors' remuneration —				
auditing the accounts	92	69	92	69
other services	21	19	21	19
(The auditors have received no other benefits)				

## 3. Depreciation and amortisation

The amount charged against earnings comprised:

Depreciation on: buildings	15 804	11 349	15 804	11 349
plant, machinery and equipment	24 705	26 050	24 705	26 050
Amortisation of: mine property	3 106	3 106	3 106	3 106
borrowing expenses	226	225	226	225
Total	<u>43 841</u>	<u>40 730</u>	<u>43 841</u>	<u>40 730</u>

As a result of the revaluation of the Company's buildings, plant and machinery by K300 000 000 coupled with a re-assessment of economic lives of these assets, the depreciation charge for 1980 increased by K3 000 000.

## 4. Current taxation

The income tax charged against earnings has been determined in accordance with the policy set out in Note 1.

The following reconciliation discloses the items which caused the charge for income tax in the statements of earnings to vary from the income tax prima facie payable on reported earnings:

Income tax prima facie payable on reported earnings at normal rate	44 790	59 063	44 790	59 063
plus/(minus) income tax at normal rate on:				
variation between provision for depreciation in statements of earnings and amount deductible for taxation	1 926	700	1 926	700
excess of other provisions over payments	772	629	772	629
net exchange (gains)/losses which are exempt from taxation	(694)	(1 311)	(694)	(1 311)
variation on valuation of trading stock	—	(1 269)	—	(1 269)
allowance on purchase of consumable aids and operating spares	(1 546)	(1 136)	(1 546)	(1 136)
other	(81)	22	(81)	22
	<u>45 167</u>	<u>56 698</u>	<u>45 167</u>	<u>56 698</u>
Additional profits tax	11 566	20 401	11 566	20 401
	<u>56 733</u>	<u>77 099</u>	<u>56 733</u>	<u>77 099</u>
Minus rebates	(150)	—	(150)	—
Income tax payable on year's earnings	<u>56 583</u>	<u>77 099</u>	<u>56 583</u>	<u>77 099</u>
Taxation under/(over)-provided in previous year	(5 404)	801	(5 404)	801
Charge for income tax in statements of earnings	<u>51 179</u>	<u>77 900</u>	<u>51 179</u>	<u>77 900</u>

The Mining (Bougainville Copper Agreement) Act provides the basis for determining the Company's income tax liability. Under this Act, the standard Papua New Guinea tax rate of 36.5% applies to taxable income. If taxable income exceeds a certain level, which for 1980 is K89 210 000, then a rate of 70% applies to taxable income above that level. Standard company tax for 1980 at 36.5% is K39 613 000 and additional profits tax at 33.5% of the excess above K89 210 000 amounts to K11 566 000.

## 5. Capital

On 7 February 1980, the Directors revalued the Company's buildings, plant and machinery by K300 000 000 so as to represent the value of the Company's fixed assets more realistically. This amount was transferred to an Asset Revaluation Reserve.

On 17 April 1980, the authorised capital of the Company was increased to K425 000 000 by the creation of 580 000 000 ordinary shares of 50 toea each.

On 23 April 1980, K267 375 000 of the Asset Revaluation Reserve was applied in paying up 534 750 000 shares of 50 toea each issued to shareholders as fully paid bonus shares in the proportion of two ordinary shares for every one ordinary share held, and all of the Company's shares of 50 toea were consolidated into shares of one kina each.

The authorised share capital of the Company at 31 December 1980 was K425 000 000 divided into 425 000 000 shares of one kina each and its issued share capital was 401 062 500 ordinary shares of one kina each.

## 6. Asset revaluation reserve

The movements in Asset Revaluation Reserve were:

Revaluation of buildings, plant and machinery	300 000	—	300 000	—
Less: Two for one bonus issue of shares	267 375	—	267 375	—
	<u>32 625</u>	—	<u>32 625</u>	—
Less: Adjustment to revaluation reserve due to early retirement of certain assets which had been revalued	1 349	—	1 349	—
	<u>31 276</u>	—	<u>31 276</u>	—

Consolidated		Bougainville Copper Limited	
1980	1979	1980	1979
K'000	K'000	K'000	K'000

## 7. Exchange fluctuation

(a) The movements in Exchange Fluctuation Account relating to overseas loan obligations were:

Balance of unrealised gains 1 January	5 387	9 003	5 387	9 003
Increase/(decrease) due to currency movements during the year	<u>1 510</u>	<u>(471)</u>	<u>1 510</u>	<u>(471)</u>
	<u>6 897</u>	<u>8 532</u>	<u>6 897</u>	<u>8 532</u>
Gains realised on loan repayments during the year	1 843	3 145	1 843	3 145
Balance 31 December	<u>5 054</u>	<u>5 387</u>	<u>5 054</u>	<u>5 387</u>

(b) The net exchange gains credited to earnings consist of:

Gains realised on loan repayments	1 843	3 145	1 843	3 145
Gains on conversion of overseas cash balances to Papua New Guinea kina	<u>730</u>	<u>400</u>	<u>730</u>	<u>400</u>
Net exchange gains	<u>2 573</u>	<u>3 545</u>	<u>2 573</u>	<u>3 545</u>

## 8. Long term loans

(a) Total long term loans, which are all secured, are repayable as follows:

within one year	7 893	10 094	7 893	10 094
later than one year	<u>22 421</u>	<u>33 354</u>	<u>22 421</u>	<u>33 354</u>
Total outstanding obligations	<u>30 314</u>	<u>43 448</u>	<u>30 314</u>	<u>43 448</u>

All loans are secured by a charge over 291 759 653 shares in the Company owned by CRA Limited, The Independent State of Papua New Guinea and The Investment Corporation of Papua New Guinea. The charge was established under a Credit Agreement dated 28 July, 1969, but can only become enforceable after default in respect of the Japanese equipment loan. The charge is not directly enforceable by other lenders.

(b) The following are the individual loans which make up the total outstanding loan obligations:

	Interest Rate 1980	Repayable				
Bank loans						
International Westminster Bank (US dollars)	10.81%	1981	646	2 077	646	2 077
Bank of America (US dollars) (Note (c))	13.00%	1981-1982	1 808	5 261	1 808	5 261
Papua New Guinea Banking Corporation (kina)	9.25%	1981-1985	<u>8 000</u>	<u>10 000</u>	<u>8 000</u>	<u>10 000</u>
			<u>10 454</u>	<u>17 338</u>	<u>10 454</u>	<u>17 338</u>
Other loans						
Japanese equipment loan (US dollars)	6.85%	1981-1982	2 639	4 244	2 639	4 244
Australian equipment loans (Aust. dollars)	7.50%	1981-1982	1 162	3 326	1 162	3 326
E.F.I.C. Crusher loan (Aust. dollars)	8.75%	1981-1984	2 245	2 897	2 245	2 897
Bearer Notes due 1984 (US dollars)	8.75%	1981-1984	13 814	15 643	—	—
Loan from Subsidiary (US dollars)	8.75%	1981-1984	—	—	13 814	15 643
			<u>19 860</u>	<u>26 110</u>	<u>19 860</u>	<u>26 110</u>
Total outstanding obligations			<u>30 314</u>	<u>43 448</u>	<u>30 314</u>	<u>43 448</u>

(c) The Company prepaid K1 600 000 of the Bank of America loan during 1980.

## 9. Creditors

Amounts due to creditors comprised:

Related corporations:

Subsidiary company	—	—	821	924
Other	295	718	295	718
Trade creditors	17 426	8 431	17 426	8 431
Other current liabilities:				
Secured	954	1 216	131	290
Unsecured	<u>14 466</u>	<u>12 629</u>	<u>14 466</u>	<u>12 629</u>
Total	<u>33 141</u>	<u>22 994</u>	<u>33 139</u>	<u>22 992</u>

## 10. Property, plant and equipment

	Cost or valuation K'000	Accumulated depreciation K'000	1980 net K'000	1979 net K'000
Leasehold land & buildings				
—at cost	10 493	264	10 229	158 405
—at 1980 directors' valuation	295 450	15 464	279 986	—
Plant, machinery & equipment				
—at cost	16 927	1 024	15 903	121 408
—at 1980 directors' valuation	280 943	22 817	258 126	—
Mine property—at cost	62 122	27 165	34 957	38 063
Capitalised borrowing expenses—at cost	5 827	5 472	355	582
Capital works in progress—at cost	<u>11 203</u>	—	<u>11 203</u>	<u>7 001</u>
	<u>682 965</u>	<u>72 206</u>	<u>610 759</u>	<u>325 459</u>

Consolidated		Bougainville Copper Limited	
1980	1979	1980	1979
K'000	K'000	K'000	K'000

### 11. Investments

Investments are valued at cost.

Unquoted shares in related corporations:

Subsidiary company	—	—	9	9
Other	38	38	38	38
	<u>38</u>	<u>38</u>	<u>47</u>	<u>47</u>
Unquoted shares in other companies	45	45	45	45
Total	<u>83</u>	<u>83</u>	<u>92</u>	<u>92</u>

### 12. Other debtors

Amounts due from other debtors comprise:

Related corporations	217	323	217	323
Other debtors and payments in advance	2 263	2 962	2 263	2 962
Provision for doubtful debts	(50)	(50)	(50)	(50)
Total	<u>2 430</u>	<u>3 235</u>	<u>2 430</u>	<u>3 235</u>

### 13. Stocks and stores

Unshipped concentrate	12 842	5 873	12 842	5 873
Other stocks and stores	42 921	38 684	42 921	38 684
Total	<u>55 763</u>	<u>44 557</u>	<u>55 763</u>	<u>44 557</u>

### 14. Bad and doubtful debts

Amounts provided during the year for doubtful debts were in respect of:

Debtors	6	25	6	25
---------	---	----	---	----

Bad debts of K6 052 were written off against the provision for doubtful debts.

### 15. Directors' emoluments

The total of the emoluments received, or due and receivable (whether from the Company or from related corporations) by:

	1980		1979	
	Company K'000	Related Corporations K'000	Company K'000	Related Corporations K'000
(a) directors of the Company engaged in the full-time employment of the Company or its related corporations (including all bonuses and commissions received or receivable by them as employees but not including the amount received or receivable by them by way of fixed salary as employees). was	—	—	—	—
(b) other directors of the Company, was	12	34	3	7

No commissions for subscribing for, or agreeing to procure subscriptions for any shares in or debentures of the Company or any related corporation, were received or are due and receivable by any director.

### 16. Commitments for capital expenditure

The commitments for capital expenditure not reflected in the financial statements total approximately K9 708 000 (1979, K9 995 000).

### 17. Contingent liabilities

Bougainville Copper Limited has guaranteed the Bearer Notes issued by its subsidiary (K13 814 000). There are no other contingent liabilities which are material in nature or amount.

### 18. Ultimate holding company

The ultimate holding Company is The Rio Tinto-Zinc Corporation Limited (incorporated in England).

# Declarations

## Statement by Directors

In the opinion of the Directors of Bougainville Copper Limited the accompanying statements of earnings are drawn up so as to give a true and fair view of the results of the business of the Company and its subsidiary for the period covered by the statements and the accompanying balance sheets are drawn up so as to exhibit a true and fair view of the state of affairs of the Company and its subsidiary at the end of that period.

Signed at Panguna this 10th day of February, 1981.

On behalf of the Board  
D. C. VERNON, P. W. QUODLING  
Directors

## Declaration by Secretary

I, Jillian Margaret Ferguson, Secretary of Bougainville Copper Limited, do solemnly and sincerely declare that the accompanying balance sheets and statements of earnings of the Company and its subsidiary are, to the best of my knowledge and belief, correct. And I make this solemn declaration by virtue of the Oaths, Affirmations and Statutory Declarations Act 1962, as amended to date, conscientiously believing the statements contained herein to be true in every particular.

Declared at Panguna this 10th day of February, 1981.

J. M. FERGUSON  
Secretary  
Before me:  
L. G. SMITH  
Commissioner for Oaths

## Report of the Auditors to the Members

We report on the accompanying balance sheets and statements of earnings of the Company and its subsidiary set out on pages 20 to 25 which have been prepared under the cost convention described in note 1.

In our opinion the balance sheets and statements of earnings are properly drawn up in accordance with the provisions of the Companies Act 1963, as amended, and so as to give a true and fair view of the state of affairs of the Company and its subsidiary as at 31st December, 1980, and the results for the year ended on that date.

In our opinion the accounting and other records, including registers, examined by us have been properly kept in accordance with the provisions of the Act.

COOPERS & LYBRAND  
by D.H. Evans

Registered under the Accountants Registration and Practice Act 1975.  
Arawa. 11th February, 1981

# Shareholdings

## Distribution of shares

As at 31st December, 1980:  
The issued shares of the Company were 401 062 500 fully paid one kina shares, each carrying one voting right;  
The number of shareholders was 38 326;  
The distribution of holdings of the issued shares was:

1- 1 000 shares	28 224
1 001- 5 000 shares	8 225
5 001-10 000 shares	1 054
10 001 shares and over	823
<b>Total shareholders</b>	<b>38 326</b>

83.58% of the total issued shares were held by the 20 largest shareholders;

The substantial shareholders were: CRA Limited and its wholly-owned subsidiary C.R.A. Base Metals Pty. Limited — 214 887 966 shares (53.6%). The Rio Tinto-Zinc Corporation Limited has an interest in the same shares through its wholly-owned subsidiaries, (R.T.Z. Australian Holdings Limited and C.R.A. Holdings Pty. Limited), interests in CRA Limited and C.R.A. Base Metals Pty. Limited.

The Independent State of Papua New Guinea, and The Investment Corporation of Papua New Guinea — 81 109 751 shares (20.2%).

## Ten largest shareholders

The ten largest shareholders at 31st December, 1980, and the number of shares held by each were:

Name & Registered Address:	Shares
CRA Limited, Melbourne, Vic.	210 788 514
The Independent State of Papua New Guinea	76 430 809
ANZ Nominees Limited, Melbourne, Vic.	9 429 629
The National Mutual Life Association of Australasia Limited, Melbourne, Vic.	6 476 834
National Nominees Limited, Melbourne, Vic.	5 861 349
The Investment Corporation of Papua New Guinea, Port Moresby, P.N.G.	4 678 942
Bank of New South Wales Nominees Pty. Ltd., Sydney, N.S.W.	4 436 968
C.R.A. Base Metals Pty. Limited, Melbourne, Vic.	4 099 452
Panguna Development Foundation Limited, Panguna, P.N.G.	3 600 000
The Colonial Mutual Life Assurance Society Limited, Melbourne, Vic.	2 406 886
	<u>328 209 383</u>

## Directors' interests

Directors' interests in the share capital of the Company and its related companies as at the 21st January, 1981 were:

D. C. Vernon	No interests
N. R. Agonia	No interests
J. L. Auna	No interests
Sir Roderick Carnegie	9 000 BCL shares 1 000 MKU shares 16 000 CRA shares 1 000 HHL shares
Sir Frank Espie	750 BCL shares 533 CRA shares
R. H. Harding	3 441 CRA shares 1 268 HHL shares 504 BCL shares 1 000 MKU shares
P. W. Quodling	No interests
J. T. Ralph	171 BCL shares 587 CRA shares
J. L. Kekedo (Alt. Director)	180 BCL shares
M. P. G. Togolo (Alt. Director)	360 BCL shares

Abbreviations:  
BCL — Bougainville Copper Limited  
CRA — CRA Limited  
HHL — Hamersley Holdings Limited  
MKU — Mary Kathleen Uranium Limited  
RTZ — The Rio Tinto-Zinc Corporation Limited

# Current Cost Accounting

Historic Cost Accounting (HCA) became the accepted practice at a time when inflation was an insignificant consideration. Today's world is considerably different with inflation now a part of the economic environment despite the efforts of governments. Under these circumstances Historic Cost Accounting can present a misleading view of the Company's financial position. Further, the taxation by Government of a

company's profit determined on an HCA basis, taxes "paper profits" and can thus be a threat to company liquidity.

There has been much discussion of different accounting systems that might overcome these difficulties. One alternative system, which is gaining acceptance on an international basis, is Current Cost Accounting (CCA). The Company has therefore decided that it would be appropriate to include CCA accounts in this year's Annual Report.

It should be emphasised that the systems are not yet definitive and

more discussion and amendments will be necessary. The Company does, however, consider that the figures prepared on the basis of CCA principles provide a more realistic view than those prepared on an HCA basis.

The Current Cost Statement of Earnings and Balance Sheet presented below have been prepared in accordance with the Statement of Standard Accounting Practice No. 16, March, 1980, Current Cost Accounting, issued by the Accounting Standards Committee of the United Kingdom.

## Current Cost Statement of Earnings

	Bougainville Copper Limited and Subsidiary Company	
	1980	1979
	K'000	K'000
Income	338 662	343 064
Costs and expenses excluding interest	<u>214 976</u>	<u>180 254</u>
<b>Historical cost earnings before interest</b>	<u>123 686</u>	<u>162 810</u>
Less:		
Current cost operating adjustments (refer below)	<u>7 841</u>	<u>9 274</u>
<b>Current cost earnings from operations</b>	<u>115 845</u>	<u>153 536</u>
Add: Gearing adjustment	1 854	579
Less: Interest on net borrowing	<u>3 546</u>	<u>4 538</u>
	<u>114 153</u>	<u>149 577</u>
Add: Net exchange gains	<u>2 573</u>	<u>3 545</u>
<b>Current cost earnings before taxation</b>	<u>116 726</u>	<u>153 122</u>
Less: Current income tax	<u>51 179</u>	<u>77 900</u>
<b>Current cost earnings attributable to shareholders</b>	<u>65 547</u>	<u>75 222</u>
Add:		
Current cost retained earnings brought forward	<u>152 149</u>	<u>183 877*</u>
	<u>217 696</u>	<u>259 099</u>
Less:		
Dividends	<u>80 213</u>	<u>106 950</u>
<b>Current cost retained earnings carried forward</b>	<u>137 483</u>	<u>152 149</u>
* Historical cost retained earnings		
<b>Current cost operating adjustments:</b>		
Cost of sales	2 023	2 345
Monetary working capital	<u>2 255</u>	<u>3 118</u>
<b>Working capital</b>	<u>4 278</u>	<u>5 463</u>
Depreciation	2 704	268
Disposals of property, plant and equipment	<u>859</u>	<u>3 543</u>
<b>Property, plant and equipment</b>	<u>3 563</u>	<u>3 811</u>
	<u>7 841</u>	<u>9 274</u>
<b>Current Cost Balance Sheet</b>		
<b>Funds employed by the group:</b>		
<b>Shareholders' funds</b>		
Paid up capital	401 063	133 688
Current cost reserve	134 999	331 569
Retained earnings	<u>137 483</u>	<u>152 149</u>
<b>Total shareholders' funds</b>	<u>673 545</u>	<u>617 406</u>
Exchange fluctuation	5 054	5 387
Long term liabilities	25 721	36 204
Current liabilities	<u>143 991</u>	<u>190 400</u>
<b>Total funds</b>	<u>848 311</u>	<u>849 397</u>
<b>These funds are represented by:</b>		
Fixed assets	694 603	644 446
Investments	83	83
Stocks and stores	60 960	48 444
Other current assets	<u>92 665</u>	<u>156 424</u>
<b>Total assets</b>	<u>848 311</u>	<u>849 397</u>

# Statistical Summary

## Financial

	1980	1979	1978	1977	1976	1975	1974	1973	1972*
<b>Earnings (K million)</b>									
Net sales revenue and other income	338.7	343.1	225.1	205.3	208.9	193.1	292.6	252.4	95.9
Operating and other expenses	174.8	144.1	125.0	126.8	117.5	107.2	92.5	81.8	53.3
Depreciation	43.8	40.7	40.4	36.2	31.1	29.6	28.5	24.8	14.5
Earnings before taxation and exchange gains	120.1	158.3	59.7	42.3	60.3	56.3	171.6	145.8	28.1
Exchange gains	2.6	3.5	10.3	(0.1)	1.3	2.3	9.5	12.9	(0.4)
Earnings before taxation	122.7	161.8	70.0	42.2	61.6	58.6	181.1	158.7	27.7
Taxation	51.2	77.9	22.0	13.7	20.3	12.4	66.5	0.3	—
Net earnings	71.5	83.9	48.0	28.5	41.3	46.2	114.6	158.4	27.7
Dividends	64.2	80.2	40.1	21.4	26.7	26.7	73.5	81.4	11.0
Earnings retained	7.3	3.7	7.9	7.1	14.6	19.5	41.1	77.0	16.7

## Balance sheet (K million)

Property, plant and equipment	610.8	325.4	340.1	352.2	350.4	346.0	352.2	371.7	378.7
Investments	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	—
Current assets	148.4	201.0	125.8	137.1	136.0	129.5	205.6	130.4	73.9
Total assets	759.3	526.5	466.0	489.4	486.5	475.6	557.9	502.2	452.6
Shareholders' funds	584.5	294.5	317.5	309.7	302.5	287.9	268.4	227.4	146.7
Exchange fluctuation	5.1	5.4	9.0	14.6	9.0	11.5	19.1	39.5	24.2
Long term liabilities	25.7	36.2	42.1	53.3	101.7	106.8	121.1	127.5	204.0
Current liabilities	144.0	190.4	97.4	111.8	73.3	69.4	149.3	107.8	77.7
Funds employed	759.3	526.5	466.0	489.4	486.5	475.6	557.9	502.2	452.6

## Production/Sales

<b>Mined</b>									
Ore and waste removed (millions of tonnes)	79.76	75.97	79.05	70.79	58.54	56.40	56.00	56.65	46.75
Ore milled (millions of tonnes)	37.62	36.17	38.12	34.11	31.21	31.08	30.14	29.14	21.89
Ore grade									
Copper (per cent)	0.46	0.55	0.60	0.61	0.64	0.64	0.70	0.73	0.76
Gold (grams/tonne)	0.50	0.75	0.82	0.90	0.87	0.80	1.02	1.03	0.77
Silver (grams/tonne)	1.47	1.70	1.80	1.86	1.96	1.87	2.12	1.99	2.06

## Produced

Concentrate (thousands of dry tonnes)	510.4	584.7	658.6	615.6	596.8	595.5	640.8	650.2	438.1
Contained copper (thousands of dry tonnes)	146.8	170.8	198.6	182.3	176.5	172.5	184.1	182.9	124.0
Concentrate grade									
Copper (per cent)	28.8	29.2	30.2	29.6	29.6	28.9	28.7	28.1	28.3
Gold (grams/tonne)	27.5	33.7	35.5	36.3	33.9	30.5	32.0	31.6	27.3
Silver (grams/tonne)	72.2	76.3	79.8	77.1	76.1	71.0	72.0	69.0	69.3

## Shipped

Total concentrate (thousands of dry tonnes)	494.4	586.5	640.9	614.8	605.8	586.9	665.7	625.2	434.4
Shipped to:									
W. Germany	163.7	187.6	206.8	198.3	223.2	243.5	221.4	200.3	186.8
Japan	269.4	328.2	326.7	337.1	256.4	250.7	343.2	342.9	209.0
Spain	41.0	49.0	62.1	47.0	58.2	72.2	57.4	35.8	27.6
Other	20.3	21.7	45.3	32.4	68.0	20.6	43.8	46.2	11.0

## Values

Net concentrate sales value (K million) (after treatment and refining charges, freight, etc.)	334.5	338.9	222.9	200.6	205.3	184.8	279.8	249.0	95.7
Contribution by:									
Copper (per cent)	51	60	64	66	74	69	74	83	83
Gold (per cent)	46	37	34	32	24	29	25	16	16
Silver (per cent)	3	3	2	2	2	2	1	1	1

## Other

<b>Average metal prices</b>									
L.M.E. copper (US\$/lb)	99.2	89.8	61.9	59.3	63.6	55.9	93.3	80.9	48.6
London gold market (US\$/oz.)	614.7	304.7	193.5	147.8	124.8	160.9	158.7	97.3	58.2
London silver market (US\$/oz.)	21.0	11.0	5.4	4.6	4.4	4.4	4.7	2.5	1.7
Return on shareholders' funds (%)	12.2	28.5	15.1	9.2	13.7	16.0	42.7	69.7	18.9
Earnings per share (toea)**	17.8	20.9	12.0	7.1	10.3	11.5	28.6	39.5	6.9
Dividends in toea per fully paid share*** (par value, one kina)	16.0	20.0	10.0	5.3	6.7	6.7	18.3	20.0	2.7
Bonus dividend in toea per fully paid share***	4.0	6.7	—	—	—	—	—	—	—
Number of shares issued at end of year (thousands)	401 063	267 375	267 375	267 375	267 375	267 375	267 375	267 375	260 000**
Number of shareholders at end of year	38 326	38 750	40 935	43 820	50 082	54 129	55 558	45 353	46 726
Debt/equity ratio	0.05/1	0.15/1	0.19/1	0.37/1	0.40/1	0.44/1	0.52/1	0.72/1	1.62/1
Work force at end of year (P.N.G.)									
Overseas	877	851	855	853	858	942	980	929	971
National	3 416	3 314	3 243	3 063	2 989	3 094	3 242	2 915	2 594

## Notes:

\* Full year figures; but commercial production commenced 1 April, 1972.

\*\* 1972 figure is for Bougainville Mining Limited.

\*\*\* 1972 to 1979 figures are after adjustment for the 1980 capital reconstruction





# **Bougainville Copper Limited**

(Incorporated in Papua New Guinea)

Annual Report 1980

equivalent figure for 1979 being a surplus of K52 million. These two factors have caused speculation that the Government might be forced to reconsider its hard kina strategy. However, in the Budget delivered in November, the continuation of the hard kina policy was confirmed. As noted above such a policy will tend to adversely affect the Company's profitability.

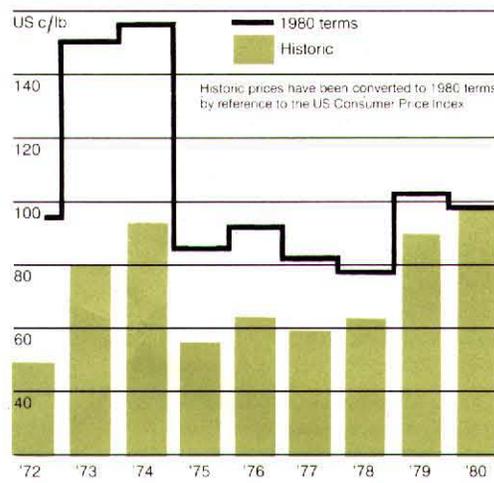
1980 has been a year of political change in Papua New Guinea. At the national level, Sir Julius Chan replaced Mr. Somare as Prime Minister. In the Provincial elections held in June, Mr. Hannett defeated Dr. Sarei and became the new premier for the North Solomons Province.

During 1980 the Company continued to make a significant contribution to Papua New Guinea's economy. The Company's net sales were an estimated 57% of the country's total exports in 1980. Payments to the Government in the form of dividends, taxes (excluding those on salaries and wages) and royalties amounted to K81 million. Taxes on wages and salaries indirectly contributed a further K7 million. The Government's planned expenditure for 1981 is K694 million.

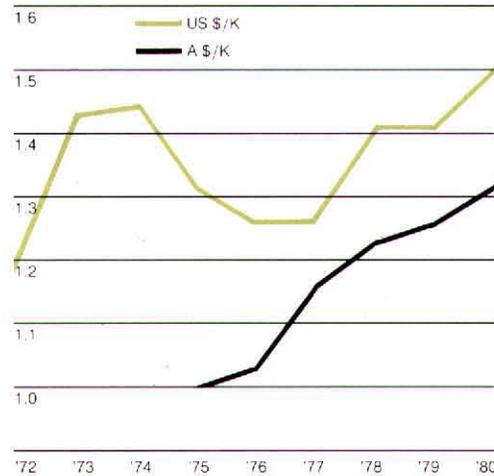
The magnitude of this contribution to the country's economy makes it important that the Company's orderly development is efficiently planned. Current ore reserves are estimated to last until the end of this century. However, given the extremely long lead times involved in locating, exploring and developing new ore bodies, it is essential that the present restriction on the Company's ability to explore outside its current lease be relaxed as soon as possible. If this is not done it may not be possible to make optimum use of the infrastructure already developed on Bougainville Island. Discussions are currently continuing with both National and Provincial Governments and the Company is hopeful that the position may change in the near future.

The Company continues to emphasise the employment and training of Papua New Guinea Nationals at all levels of management as part of its localisation programme. The speedy recruitment of skilled staff is of great importance to the efficient operation of the Company. The recent introduction of the Employment of Non Citizens Act has been causing a number of problems for the Company in its recruitment of overseas personnel. The procedures involved in obtaining work permits and visas have become extremely protracted. Unless this situation improves in the near future it is likely that the efficiency and profitability of the Company's operation will be adversely affected.

Copper prices 1972-1980



Exchange rates 1972-1980

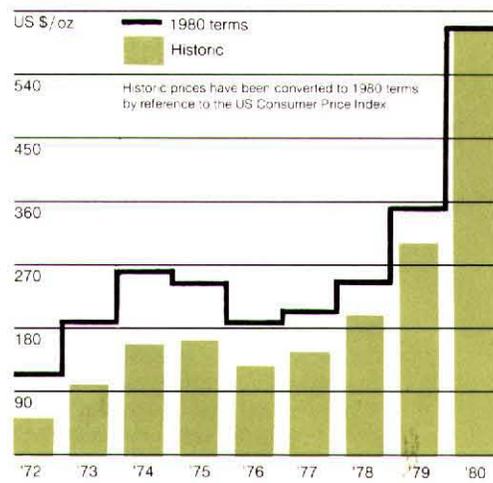


The Bougainville Copper Agreement, as amended in 1974, provides for reviews of the Agreement's operation at seven year intervals. The first of these reviews is due in 1981. There are a number of issues that the Company wishes to discuss with the Government covering topics such as taxation, including the impact of inflation, and exploration. The resolution of these problems would enable the Company to enter the next decade with greater confidence and certainty with regard to its future.

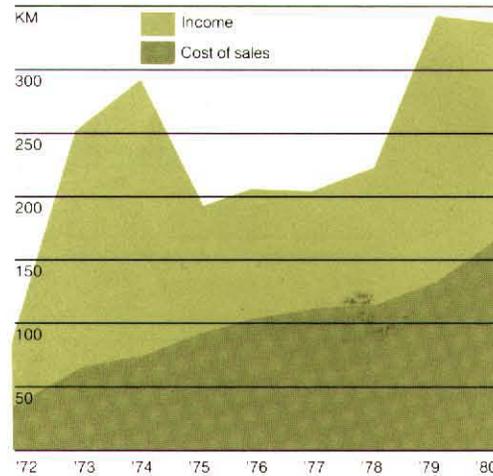
The Directors would like to take this opportunity to pay tribute to the dedication of all its employees and thank them for their efforts over the past year. Their work has enabled the Company to maintain its now customary high level of efficiency. This year we have taken the occasion of the Annual Report to feature four of them.

D. C. Vernon, Chairman  
10th February, 1981

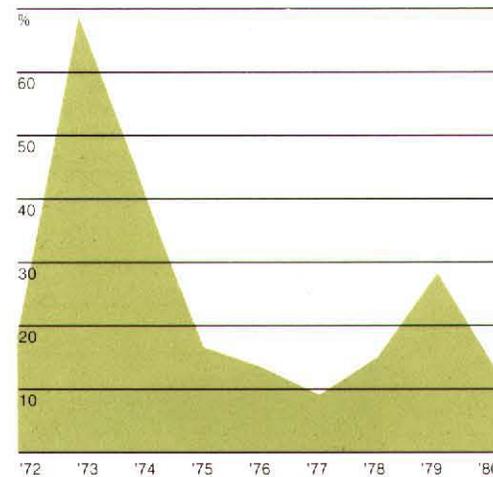
Gold prices 1972-1980

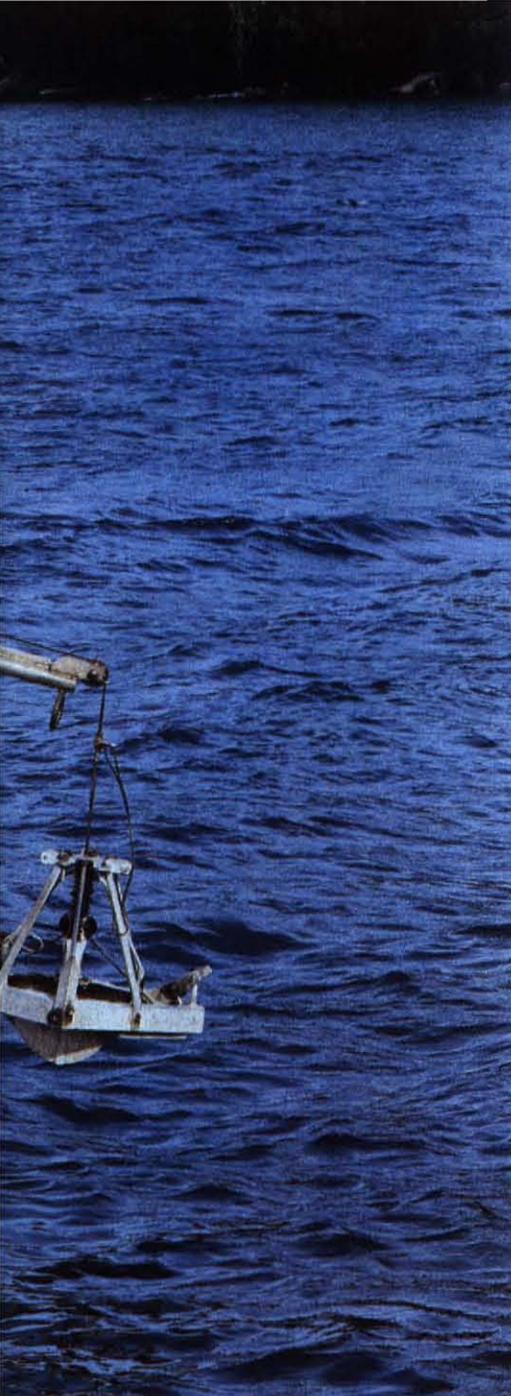


Income/cost of sales 1972-1980



Return on shareholders' funds 1972-1980





and measure his progress towards more senior levels in the organisation.

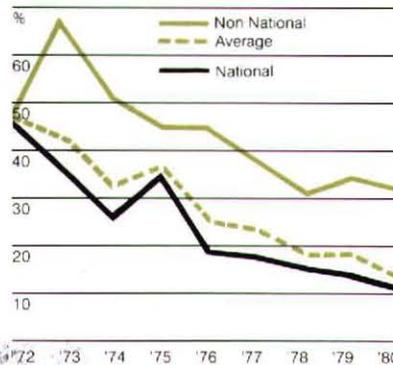
In order to comply with the Employment of Non Citizens Act information prepared from the manpower strategy has been forwarded to the Department of Labour and Industry as the Company's Training and Localisation Plan. From 7 February 1981, work permits will be issued to non citizens only for positions in the organisation approved by the Government.

Training of National employees continues to play a significant part in the commitment to the Company's localisation programme. In 1980, 21 new National graduates joined the Company making a total of 77. In addition, there are 34 Bougainville Copper undergraduates still to complete their courses.

In 1980, 82 apprentices secured their indentures; at the end of the year 267 apprentices remained in the training stream. Apprenticeships are offered in 17 trades. Undergraduate and post-graduate training was undertaken by five Nationals in Australian institutions.

Under the terms of the Bougainville Copper Agreement, the Government is responsible for the provision of satisfactory community health, education and police facilities. However, the Company has found it necessary to progressively increase its role in

Annual labour turnover 1972-1980



community support activities. The Company has given notice to the National and Provincial authorities that it wishes to review both the standards of these services and the responsibility for their operation.

**Environmental:**

Investigations into the long-term effects on the environment of tailings disposal continued as a major research programme.

During 1980, agreement was reached with the customary landowners of lease held land on the levels of compensation to be paid over a five year period. Both National and Provincial Governments participated in negotiations and contributed to the formalisation of the Agreement.

**Exploration:**

The governmental restriction on mineral exploration on Bougainville Island remained in force during the year. The drilling programme in the north east corner of the Special Mining Lease was completed; results indicate no extension of the ore body. A programme of diamond drilling to test the grade of mineralisation below the present planned pit bottom continued through the year. Results of this programme will be assessed during 1981.

**Capital Expenditure:**

Capital expenditure for the year totalled K31.6 million.

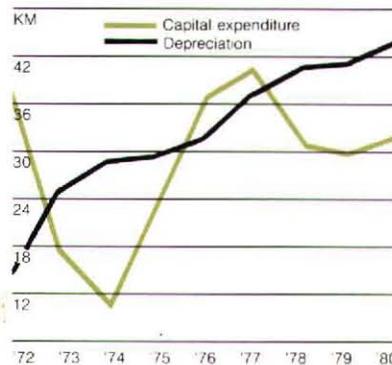
The relocation of roads, pipeline and power reticulation in the Lower Kawerong Valley continued at a cost to date of K4.8 million.

A further K2.8 million was expended on the pit drainage tunnel during the year; the total cost so far being K8.4 million. The extension to the North Channel drainage system cost an additional K1.8 million bringing the total to K7.2 million. Additional accommodation cost K3.4 million.

*P. W. Quodling*

P. W. Quodling, General Manager.  
10th February, 1981.

Capital expenditure & depreciation 1972-1980



# Gold mining in Papua New Guinea



14 oz nugget, Sandy Creek, Wau.  
(Courtesy P. L. Lowenstein)

## Introduction

The relatively short history of the Bougainville project has coincided with a period of dramatic upheaval in the gold price, causing a major reappraisal of the role of gold both in the operational and commercial activities of the Company and to the economic well-being of Papua New Guinea.

For the Company, the significance of gold has grown from that of a useful by-product during the feasibility study and construction of the project, to that of a co-product with copper in recent years. For Papua New Guinea, gold has become a valuable component of the nation's exports, helping to diversify the export base of the economy.

## New Guinea Goldfields

The rumours emanating from early explorers that New Guinea would prove a rich source of gold were given some basis in 1852 by the observations of Dr. John MacGilluray, when he found traces of gold at Redscar Bay in the present Central Province. Subsequently, in 1873 Captain Moresby located further traces of gold near Fairfax Harbour, around which the nation's capital, Port Moresby, is now located. These rumours attracted a number of prospectors, some being disappointed miners from the Australian goldfields. By the 1890's the islands of the Louisiade Archipelago supported several hundred miners and gold constituted the major export from what was then British New Guinea.

In 1922 gold was discovered on the Watut River, causing an upsurge in prospecting in the Watut/Bulolo River system. This effort was



Gold mining, Kupei, Bougainville Island.

rewarded by an extremely rich strike of alluvial gold at Edie Creek near Wau in 1926. These discoveries soon attracted large-scale interests in the Bulolo/Wau area. By 1930, companies such as Bulolo Gold Dredging and New Guinea Goldfields were implementing major projects in the area.

The dredging operation of Bulolo Gold Dredging exploited the deep alluvial reserves along the Bulolo and Wau valleys. Eight dredges were eventually constructed, the two largest weighing 2,500 tonnes each. These huge dredges recovered more than 62,000 kilograms of gold before the last one ceased operating in 1965. A notable feature of the development of the Wau/Bulolo goldfields was the extensive use of air transport. Bulolo Gold Dredging, operating three Junkers G31, airlifted some 40,000 tonnes of cargo in Bulolo between 1931 and 1942 without a single serious accident. This demonstrated the viability of large scale air transport and can be considered as a milestone in aviation history.

New Guinea Goldfields continues to operate in the Wau/Bulolo area and the rising price of gold has attracted many of the local villagers to work alluvial occurrences with simple panning and sluicing methods. The output from these operations varies, but normally ranges between 500-800 kilograms per year.

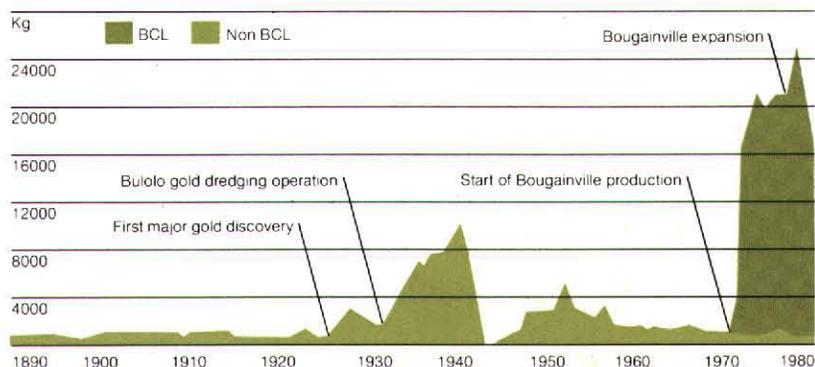
## Gold on Bougainville

Prospectors Jack Comb and Bob Palmer discovered gold in the dense rainforest of the Crown Prince Range at Kupei in 1929. A small mine was established there as well as others at nearby Moroni, Panguna and along the Kawerong River. However, the gold was difficult to win from the copper ore due to its complex metallurgy. Mining at the Kupei fields therefore tapered off in the late 1930's.

When the initial evaluation of the Panguna orebody was undertaken, the presence of gold in the ore, although in only small quantities, was recognised as a substantial benefit to the viability of the proposed large tonnage copper mining operation. Despite the low grade of gold in the ore, the massive scale of mining operations results in Bougainville Copper being ranked high on the list of the world's gold producers. In fact the mine on Bougainville is the largest single gold source in the non-Communist world outside of South Africa. Gold production for 1980 was 14,000 kilograms; total production of gold since the commencement of operations in 1972 has amounted to 171 tonnes.

Coincidentally with the commencement of production in 1972, the price of gold — which had been held at US\$35.00/oz. since 1934 — was effectively thrown open to free market forces. As a result the price has increased dramatically, though erratically, to reach a high point of US\$848/oz. in January 1980. This unparalleled rise in the price of gold has been reflected in the contribution that gold has made to the gross revenue of the Company. From a level of 16% in 1972, the first year of the Company's

PNG gold production 1890-1980 (Figures from P. L. Lowenstein (courtesy Department Minerals & Energy))



production, the contribution of gold increased to 46% of the Company's gross revenue in 1980. Thus from the status of a by-product when the mine was first conceived and brought into production, gold has developed to a position of almost equal importance with that of copper.

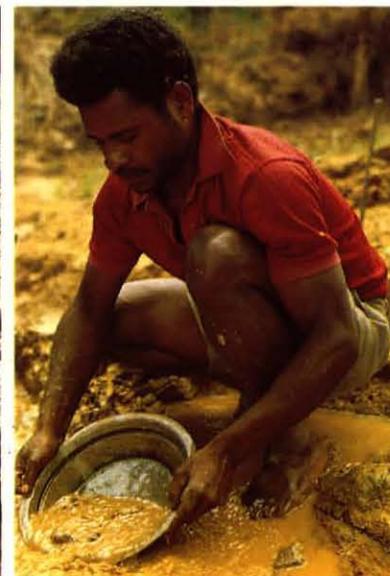
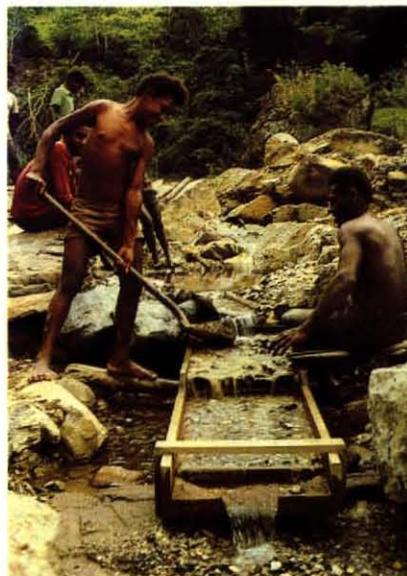
**A national asset**

Papua New Guinea has emerged as one of the world's major gold producing countries. In 1980 Papua New Guinea — with an estimated production of some 14,600 kilograms of gold — ranks as the sixth largest gold producing country in the world, behind South Africa, U.S.S.R., Canada, U.S.A. and Brazil.

The impact of gold on Papua New Guinea's economy is particularly significant. The contribution of gold to the total export earnings of the nation has grown from 11% in 1972 to an estimated 26% in 1980, surpassing such traditional exports as coffee, cocoa and copra. Thus, gold has been a major element in the establishment of a stable and diversified export base, which has facilitated the steady development of the economy in the critical period since the nation gained independence in 1975.

**The future**

Papua New Guinea seems destined to continue as a major gold producing nation. The existing ore reserves of the Bougainville mine are sufficient to sustain production well into the 1990's. While the peak level of gold production recorded in 1978 is unlikely to be matched in future years, Bougainville will continue as one of the world's largest gold producing mines for some years to come. In addition there are several other substantial prospects — at Ok Tedi, high in the Star Mountains near the Irian Jaya border; Porgera in the Central Highlands; Frieda River on the Upper Sepik — that appear likely to make substantial contributions to the nation's gold production over the coming decades. These successes are likely to stimulate further exploration efforts throughout the country and ensure gold a permanent position in the future of Papua New Guinea.

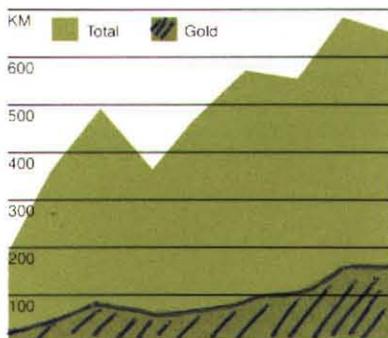


Sluicing, lower Edie Creek.  
(Courtesy P. L. Lowenstern)

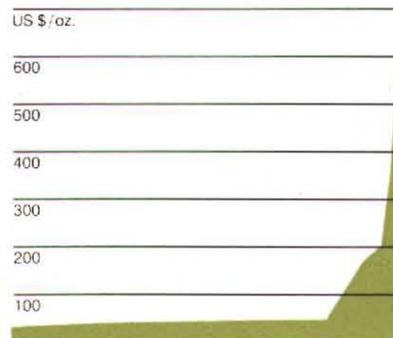
Panning for gold.

Top: Early drilling, Bougainville Island.

PNG exports 1972-1980



Gold prices 1930-1980



Gold as a percentage of Bougainville Copper gross revenues 1972-1980

