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EARTHWORKS

KILLING THE GOOSE THAT LAID THE GOLDEN EGGS—THE STORY OF THE PANGUNA MINE, BOUGAINVILLE ISLAND, PAPUA NEW GUINEA

C.K. Brooks

This is the story of the rise and fall, over a twenty-year period, of one of the world's largest mining operations. It was inspired by recent rumblings over an embryonic gold mining project in Greenland, earlier reported in these pages (Brooks, 1990) coupled with my own experience in the South Pacific region where I came frequently as a guest of Bougainville Copper Ltd. During these early stages of the Greenland project I became convinced that there was a potential for a repetition of the Bougainville saga. There are many striking similarities, although these are not the subject of this note. Rather, the intention is to increase awareness of Bougainville, which was a great success, turned sour. If nothing more comes out of it, perhaps we can learn to avoid repetition some time and some place in the future. Forwarned is forarmed.

Start-up and teething problems

In 1964 copper was discovered at Panguna in the rugged interior of Bougainville Island, part of the then Territory of Papua and New Guinea, at that time under Australian rule. Extensive drilling soon showed that the deposit, a porphyry copper, contained around 900 million tons of ore grading 0.48% Cu and 0.36 dwt (0.018 oz) per ton of gold and although these figures seem low, experience elsewhere with porphyry coppers, first at Bingham Canyon, Utah, had shown that such a huge deposits can be profitably worked by bulk methods, which allow economies of scale. These expectations rapidly began to be fulfilled at Panguna. After development costs estimated at around \$400 million, the mine opened in early 1972 and later in the year production was close to the planned

capacity of 28.9 million tones per year of ore. Bougainville Copper Limited (B.C.L.), owned 20% by the Administration of PNG, the remainder being two thirds by 'Conzinc Riotinto of Australia and one third by New Broken Hill Consolidated, already showed a profit of \$145.6 million in the first year of operation.

However, as many people have experienced, success does not always lead to a problem-free existence, and voices were already raised in the PNG House of Assembly in 1972 in favour of a renegotiation of the agreement with the company. By early 1974, critics were starting to demand a government take-over of the company. They were angered by the fact that in the first full year of operations (1973) the company had returned a profit one and half times the estimated total for internally



raised government revenue. These very high profits resulted from the sharply increased prices on the London Metal Exchange, a situation not envisaged in the original planning.

By October 1974, a new agreement was signed with B.C.L. in which 'super profits' would be subjected to additional taxation, an agreement with which the then Chief Minister, Mr Michael Somare, was reported to be 'very happy'.

However, by December the same year, relations between the Bougainville Island Assembly and the Papua New Guinea National Assembly were reported to be deteriorating. Islanders demanded a much greater share of the royalties from the mine and were threatening disruptive action. At independence from Australia in September 1975, the island declared its secession from the new state of Papua New Guinea,

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declaring itself the 'Independent Republic of the North Solomons', thereby threatening the whole fabric of the new country, an unbelievable conglomeration of disparate ethnic groups and cultures. In addition to these troubles, the mine was hit by a wages dispute shortly before independence which threatened to bring the operation to a halt. During these disputes, bulldozers were used by strikers to close the mine access road, damage valued at A\$400,000 was caused by riotous workers and lost production amounted to a further loss of A\$2 million (although various assessments were published).

In the event, the situation was brought under control by the end of 1976 by the creation of a federal system in Papua New Guinea in which each of the 19 new provinces achieved a certain measure of local control, especially over locally generated revenues. This arrangement apparently appeased the inhabitants of the newly created province of the North Solomons, but not before Bougainville Copper had come close to closure.

Development of the project

1977 also turned out to be a hard year for the company. This time, although the gold prices were up (Bougainville was producing about 15 tons of gold annually at this point although revenues from gold had not been incorporated in the original planning), copper prices had sharply declined. In fact, without gold, major losses would have been incurred, but revenues from gold now returned about half the total. The company further responded to the drop in revenues by a technique to be used several times in future: installation of an extra ball mill, on this occasion, the tenth. In this way decreasing revenues were offset by increased production.

By the end of 1978, B.C.L. had bounced back with earnings rising from Kina 28.53 million to K 48.02 million in 1978 (at this time the Kina was approximately 15% above par with the Australian dollar, but was



Aerial view of the Panguna mine taken in 1978. Mine access road in the foreground, crushing and flotation facilities at right.

soon to rise). Concentrate produced contained 198,603 tonnes of copper, 23,367 kg of gold and 52,525 kg of silver, making it the world's largest operating gold mine outside south Africa. Most of the improvement was said to be due to improved productivity rather than improving metal prices — during the year 38.1 million tonnes of ore were mined, along with 40.9 million tonnes of waste and this was an increase of 8 million tonnes compared to the

previous year. These figures taken together made the mine among the most efficient in the world.

1979 again showed an increase in earnings to K83.9 million and in 1980 there was a modest fall to K71.5 million largely caused by falling ore grades. This situation was to be offset by the installation of an eleventh ball mill in 1982 increasing capacity by 10%.

In 1981, net earnings were again down (to K22.8 million) as a result of

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Above: Mining at Panguna: Euclid R190 haul trucks and P & H 2800XPA electric shovel which, with each scoop can take about 25 tonnes of ore.

Below: Blasting at Panguna. Around 120,000 tonnes of ore were mined each day.

lower metal prices, which offset higher production. 1981 also saw the resurgence of political problems, with a dispute over the share-out between the National and Provincial governments of the royalty payments. This was backed up by industrial action. Another continuing cause of worry was the ban on further exploration placed on the company by the Provincial government, exploration being a necessity if the operations were to be prolonged over the two decades projected at that time as the life of the present mine.

After a further drop in earnings in 1982 to K11.2 million, 1983 showed a rise to K54.6 million, by which time, yet another ball mill (no. 12) had been installed to increase throughput and no. 13 was planned for 1985. In 1984 profits were again down (K11.6 million) due to low grades combined with a 16 day strike, but 1985 showed a rise in profitability again (K28.1 million) due to increased production, brought about largely by the new ball mills. Metal prices at this time were low.

Profits were again up in 1986 to

K45.3 million, again due largely to increased profitability, while in 1987 net earnings had more than doubled to K93.6 million primarily attributable to an improvement in copper prices which rose from US 60 cents/pound in January to 145¢/lb in December. During this year the installation of the world's largest and longest gravity flow slurry pipeline was announced for tailings disposal (32 km in length and 0.82 m in diameter).

In 1988, obviously in a mood of optimism, the company was announcing major developments, including the installation of a fifteenth ball mill. This optimism was bolstered, not only by the soaring profits, but also by the reelection of the government of Mr Pias Wingti, promising political stability in the country, and the introduction of new mining laws which were expected to largely maintain the favourable climate for B.C.L.

The death of Bougainville Copper

Trouble was not long in coming, catastrophic for B.C.L, but deeply disturbing to the whole state of Papua New Guinea. In November 1988 an outbreak of violence was reported where local inhabitants threw stones at employees, damaged mine equipment and a helicopter and set fire to buildings. In addition high explosives were stolen and power lines were dynamited on two occasions. Arson was also committed against property in Arawa, capital of the North Solomons Province. As a result of these activities, carried out by disgruntled local landowners, demanding massive compensation, the company suspended operations until the government could guarantee security for the company's personnel and assets.

Production started again on December 10 after an estimated loss of K1.3 million. Amazingly 1988 earnings were once again up, to K108.6 million (US\$1 = K0.84 at this time) or roughly the levels experienced in early days, in spite of massive additional profits taxation and the civil disruption.

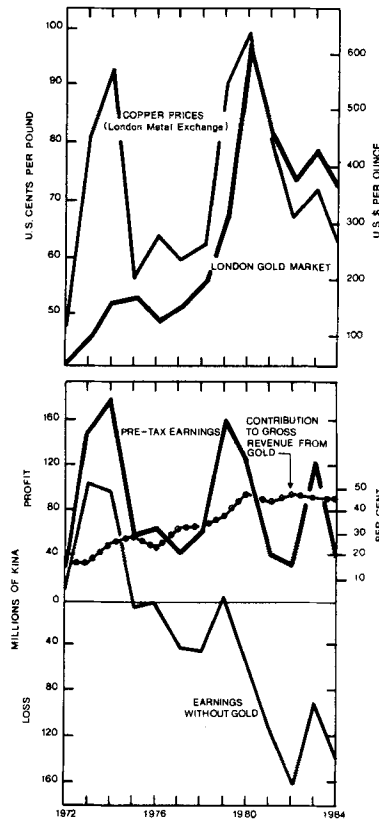
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Production continued until April 1989 when several killings occurred; among others, the death of two Papua New Guinea soldiers, the first military personnel to be killed in action since independence 14 years previously. Four hundred troops of the PNG defence force had been called in with shoot-to-kill orders in an attempt to halt the violence. Mining operations were halted on May 15 after two mine workers were wounded by arrows and several other workers had previously been hit by sniper fire from the jungle. Further sabotage also occurred to installations, bringing operations to a halt *de facto*.

After 113 days of lost production, valued at US\$200 million, operations resumed on September 5 only to be stopped after 8 hours when two buses carrying employees were hit by gunfire and it became clear that the government's guarantees of safety could not be met. The same evening, damage was caused to mine installations once again. By this time, 12 people had died.

The islanders were reportedly claiming compensation of K11,000 million (around US\$13,000 million), ostensibly for environmental damage. They were simultaneously seeking secession from PNG (their cultural and ethnic ties are with the Solomon Islands and the large numbers of tribal highlanders brought in from the mainland as mineworkers caused much resentment). This must be seen in context: over the course of its operations, B.C.L. had distributed K22 million in compensation and royalties while the provincial government had paid K75 million to the local land owners.

In January 1990, the mine was put on a 'care and maintenance' basis and some 2000 of the 2300 employees were paid off at a cost in redundancy payments of \$A30 million. In February, an Australian was shot dead at the mine while a mass exodus of expatriates was taking place. Commercial flights to the island were suspended after the security forces said that they could no longer guarantee safety and, in March,



Salient features of the economy of Bougainville Copper Ltd. over the period 1972 (start-up) to 1984. Gold, which was not included in the original feasibility study, made a steadily rising contribution to total profits, by 1980, approaching 50% making it a co-product of copper rather than a by-product.

troops and police withdrew from the island leaving it in rebel hands.

BCL, not surprisingly paid out no dividends in 1989, the first time since commencement of operations in 1972. The 1988 profit of K108.6 million had been converted into a net loss in 1989 of K20.6 million (US\$1 = K0.98). At the same time, the national impact was spectacular with a 12% fall in per capita GNP being forecasted for the two year period 1989-1990.

Summary and conclusions

During its lifetime, BCL's Panguna mine generated K1,600 million (or almost US\$2,000 million) from concentrates containing 3.1 million tonnes of copper, 306 tonnes of gold

and 783 tons of silver. These metals had an estimated value of K15,100 million or 44% of PNG's exports over that period (coffee the second most important export represented only some 15%). Dividends, taxes and royalties totalled some 17% of the nation's internally generated revenue. Panguna produced approximately 2.5% of the world's total copper output, supplying buyers in Japan, FRG, Spain, South Korea and the Philippines. At the time of its closure, an ambitious investment programme had been commenced including the installation of no. 15 ball mill, new haul trucks and 3 new electric shovels. There is now no sign that operations can resume again in the foreseeable future. The story of the Panguna mine is the epitome of the entire industry: a fascinating struggle with ore grades, metal prices, industrial relations, political interference and civil stability. If these factors can be mastered, fabulous riches can be earned, but at every point along the way, disaster may be just around the corner.

For Europeans, Bougainville lies far away, on the other side of the world in exotic surroundings, only a century ago inhabited by warring stone age cannibals. Nevertheless, the story of the Panguna mine led to loss of life, literally rocked a nation, seriously affected one of the world's major mining conglomerates (Rio Tinto Zinc) and threatened to influence world copper prices (although this, in fact, never happened due to the coincidence of increased production elsewhere). Moreover, the story has morals which are applicable to such projects anywhere.

As a distant observer, it would seem to me (although I stand to be corrected) that the whole sorry conclusion can be ascribed to greed and to lack of understanding of other cultures.

I suspect that greed on the part of the islanders was a strong factor, as witnessed by the fact that their opposition appeared at times of excessive profits. If they felt compensation to be inadequate, why did they not react at other times?

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Lack of understanding of culture was a factor on both sides. It has always been difficult for westerners to appreciate the relation between people and land in Melanesia. People belong to their land, it is not a commodity which can be bought and sold, much less destroyed. Likewise, local landowners, not unexpectedly, do not appreciate the machinations of a large industrial operation. The combination of these two factors has potential for disaster right from the start and it is too easy to become complacent when things seem to be going well.

In the special case of B.C.L., there was the problem of the province against the nation, again a situation not unexpected in a country as young and varied as Papua New Guinea, stretching across 1000 km of the western Pacific and with more than 700 local languages. However, the situation also occurs in western countries as numerous separatist movements in modern Europe testify. It is easy for multinational companies to assume that dealings with the national governments are adequate, while resentment smoulders in local communities. 'Why' say the people of Bougainville, 'should our riches be divided with other groups of people in far-flung

places with whom we have little in common apart from a distant government, while our land, our heritage, is destroyed?' As time goes on the original compensation payments, once thought so huge, gradually fade into insignificance, especially as the foreigners are seen to make apparently outrageous profits. It is very unlikely that the landowners at the outset of the project could have had the remotest idea of the size of the operation or the spectacular environmental changes it would bring. Also, to these people, the complexities of financing such a project, particularly the risks involved and the fact that the profit is spread among countless investors, are only dimly appreciated, if at all. Moreover, I suspect that the situation is not markedly different even for the average European, whose knowledge of the mining industry is generally very vague.

How to avoid these pitfalls? I have no clear message. However, part of the answer lies in appreciating the possible problems from the start and continuing a dialogue, not only with faceless bureaucrats in the native administration, but also with those people directly involved. A large part of the answer must be in getting these people to appreciate the project in all

its facets, and at the earliest possible stage.

If nothing further is produced from Bougainville we can at least learn from these experiences. Any infant mining project would be well advised to examine the B.C.L. story.

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NOTE IN PROOF

On Wednesday, 25 January 1991, a peace agreement was signed between the government of Papua New Guinea and the secessionist rebels on Bougainville island, thus ending the two year rebellion which left more than 100 people dead.

Under the terms of the agreement the government has agreed not to prosecute the rebels and not to return the security forces to the island. In return, the rebels have agreed to disarm and surrender prisoners, with a multi-national force to be installed to monitor the peace.

The present ownership of the mine is: National Government 19.1%, CRA 53.6% and public shareholders 27.3% and there is no doubt that the mine will be reopened if a lasting agreement can be reached which will guarantee the safety of mine workers and installations. (Summarized from *Mining Journal*, 25 January, 1991, p. 54.)