

Gold exploration

Reviewed by Robert Lilljequist

Brian W Mackenzie and Michael D Dogget, *Worldwide Trends in Gold Exploration*, Centre for Resource Studies, Working Paper No 49, 1993.

Brian Mackenzie is a senior research associate of the Centre for Resource Studies at Queen's University. He has many assignments on mineral policy and planning issues for large mining companies, governments and international agencies and has obtained a world-wide recognition as a distinguished lecturer. Michel Dogget is a research associate at the same centre and holds titles in both geology and mineral economics. The Centre for Resource Studies was established in 1973 under the sponsorship of Queen's University, the federal Department of Energy, Mines and Resources, and the Mining Association of Canada. The Centre carries out research and publishes on mineral policy issues. Most of the funding for the Center's activities is provided by the sponsors.

The report on worldwide trends in gold exploration is not only a presentation of valuable figures and graphs but also gives the essential content in an easily consumed text, converting the reading to a pleasure rather than a boring lecture. The format, binding and layout of this working paper is chosen with care and gives a general pleasant impression. But most important, however, is the valuable information given, the broad overview and the insight highlights.

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The working paper examines the worldwide trends in gold exploration from 1969 to 1990, and the aim is to assess the economic prospects for gold exploration during the 1990s. Present and history supply patterns from five major gold producing countries are reviewed: Australia, Brazil, Canada, South Africa and the United States. The international price of gold, gold mine production, and gold exploration expenditures are focused for the 1969–90 period.

It is interesting to recapture that for over 100 years the US dollar value of gold was fixed, and not until 1934 it changed when the dollar was devalued and the price was fixed to 35 USD per ounce gold. Then in 1971, the convertibility of US dollars into gold ended. Since that time the free market has reigned. And who has not heard of the gold rushes to the California gold fields in 1848–56, in Australia (New South Wales and Victoria) 1851–52, Witwatersrand in South Africa in 1886, Cripple Creek in 1891, Kalgoorlie (Australia) in 1893 and the famous Klondike in 1896–1900. A modern up-surge took place at Cerro Pelado in Brazil during the 1980s when around 500 t of gold were produced by informal sector miners. It is calculated that a total of 3 000 t of gold were mined from 1700 to 1850 from operations world wide. This should be compared with the average annual gold production of 1 885 t for the 1986–1990 interval. The total production of gold in the world until 1990 is estimated to approximately 117 400 t.

It is worthy to note that the South African part of the world gold production has declined from 78 per cent to 35 per cent during the 1969–90 period, and in tonnage from 973 to 605 t. A further drop down to 500 t is expected, corresponding to almost the whole of the Canadian yearly production.

One of the conclusions of the paper is that the discovery of new gold deposits have only been sufficient to replace 60 per cent of the gold depleted from ore reserves

at operating mines. Gold exploration expenditures provide a direct measure of the level of activity in finding and delineating economic gold deposits. Expenditures for the entire period referred to average 770 MUSD per year worldwide. The peak was reached in 1987. One should bear in mind that it takes 4–8 years to find and delineate an economic gold deposit.

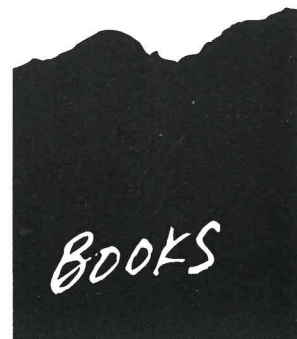
All attempts to forecast the gold price are more or less based on historical experiences. Complicated price models have been constructed and the authors give an example of International Gold Corporation which presents a function of five independent variables:

- the dollar exchange rate
- world liquidity
- real interest rates
- unanticipated inflation
- index of political tension.

Considering the problems to predict each one of these variables gives us an idea of the impossibility to predict the future gold price. However, the price has averaged 409 USD per ounce since 1969, and the authors believe that the long term future price of gold can be expected to be maintained at its historical average of above 400 USD per ounce. 140 USD in 1971 is equivalent to 440 USD in 1990.

The average undiscounted exploration expenditure per economic discovery in Australia and Brazil (13 MUSD and 17 MUSD respectively) is found to be only about one-quarter of the average discovery cost in Canada. This is an interesting fact for those interested to invest money in gold exploration, although there are many other more unpredictable factors to take into consideration. Most important is the conclusion that record levels of worldwide gold exploration during the 1980s are unlikely to result in an oversupply of gold during the 1990s. Thus, the present economic environment for gold exploration is positive.

My only major objection to the paper is the lack of relating the gold price fluctua-



tions to the market control exercised by the large international mining and financing cooperations. Anglo American Corporation of South Africa had a share of 23.7 per cent of world production from its mines world-wide in 1992 and the leading ten mining companies produced almost half of the world production (Who Owns Who in Mining 1993, published by Raw Materials Group and Roskill Information Services). Do the strategic plans of these companies have any bearing on the gold price?

This publication by Mackenzie and Dogget at the Centre for Resource Studies is highly recommended to economists, government financial departments, financial organizations, and mining company directors as well as to exploration geologists, universities, or anyone interested in the fascinating history of gold exploration and production ■

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