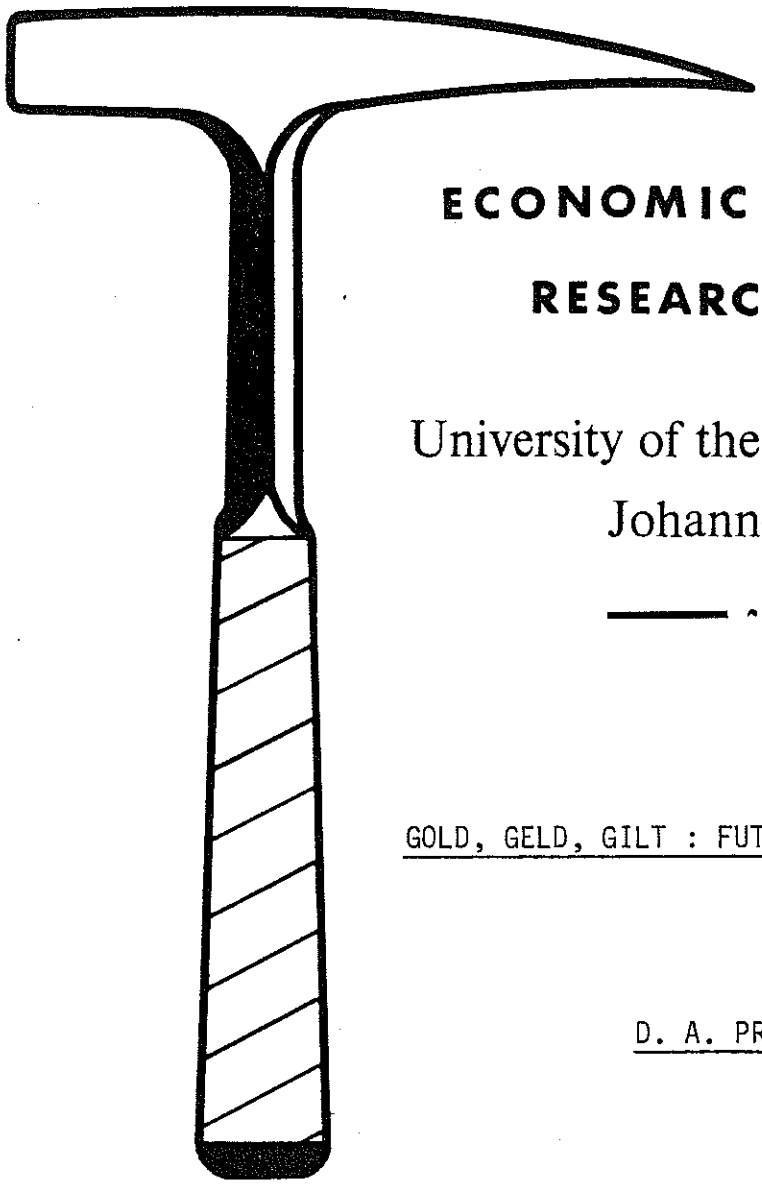

ECONOMIC GEOLOGY RESEARCH UNIT

University of the Witwatersrand
Johannesburg

GOLD, GELD, GILT : FUTURE SUPPLY AND DEMAND

D. A. PRETORIUS

INFORMATION CIRCULAR No. 152

UNIVERSITY OF THE WITWATERSRAND
JOHANNESBURG

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by

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ABSTRACT

"As South Africa goes, so the World goes" has long applied to the production and supply of gold. Since South Africa has been the source of between 40 and 50 percent, at least, of all the gold that Man has ever mined in historical times, the truth of the dictum is readily apparent. However, this situation is changing, and, by the end of the 20th Century, the U.S.S.R. probably will have the most important influence on the total amount of gold mined.

In 1979, of a World production of 1 380,6 metric tons of gold, South Africa contributed 703,3 tons (53 percent), the U.S.S.R. 376,5 tons (28 percent), Canada 49,1 tons (4 percent), the U.S.A. 28,3 (2 percent), and the rest of the World 182,7 tons (13 percent). Between 1970 and 1979, South Africa's production declined by 30 percent, Canada's by 34 percent, and the U.S.A.'s by 48 percent, but that of the U.S.S.R. increased by about 28 percent. During this same period, World production fell by 15 percent, the nett effect of a decrease of 25 percent on the part of the Western World and an increase of 15 percent by the Communist countries. The total demand for gold between 1970 and 1979 rose by 40 percent, with a progressively greater excess of demand over supply from 1976 onwards.

Sales of gold in 1979 amounted to 1 765 metric tons, 384 tons more than was actually produced. Private bullion purchases accounted for 26 percent, official coins 16 percent, and medallions 2 percent, so that 44 percent of the gold sold was employed as a hedge against inflation. Industrial demand absorbed 56 percent, with 42 percent being used for the manufacture of jewellery, 5 percent for dentistry, 5 percent for electronics, and 4 percent for other industrial purposes. The jewellery trade thus claims the largest share, by far, of gold coming on to the market. Sales of gold for the manufacture of jewellery are most susceptible to fluctuations in the price of the metal. Very marked decreases in demand characterised the elevated price of gold from 1973 to 1975, and the sharp upturn in price between 1978 and 1979 produced another conspicuous fall in the amount of gold purchased.

Estimates of the trends of future gold production speculate that, by the year 2000, South Africa's production might have decreased to 50 percent of what it was in 1979. The assumption is made, in this calculation, that no new goldfields will be found in the Witwatersrand Basin, but that several new mines will come into operation within known fields. It is anticipated that production from Canada, the U.S.A., Brazil, and Australia will be enhanced. Despite this, total production from the Western World will have declined by 17 percent by 2000. The U.S.S.R.'s output will have increased by 35 percent, and a much greater amount will be mined in China, so that the overall figure for the Communist World will have improved by 56 percent.

The nett effect on World production will be to increase the 2000 figure to only 5 percent above that for 1979. It is thought that World demand will have risen by 10 percent of the 1979 figure, after peaking in the early 1990's. The World shortfall will have increased by 30 percent between 1979 and 2000. Such a situation points to a continued positive upward trend in the price of gold over the closing two decades of the 20th Century.

A disturbing aspect of the above forecasts is that, before the end of the century, the U.S.S.R. will have supplanted South Africa as the World's leading producer of gold and that, within the first quarter of the 21st Century, output from the Communist countries will exceed that from the Western World. Thus, the U.S.S.R. will be in a position to manipulate, to a considerably greater degree, the availability of gold to the World market and, consequently, the price of the metal. The effects on Western economies could be serious. To offset the possibility of such a development, it is imperative that significant discoveries be made, in Western countries, of new Witwatersrand-type gold deposits. The decline in production cannot be countered by the enhanced exploitation of the type of mineralization which contributes to the major proportion of output from Canada, the U.S.A., Australia, and South America. Because of the time-lag between the commencement of exploration and the start of production, efforts will have to be intensified, in the immediate future, with respect to searching for new goldfields within the known Witwatersrand Basin and for further basins, containing the same type of gold mineralization, in Southern Africa and elsewhere, if the Western World is not to be relegated to a subordinate role in influencing the supply of, and demand for, gold in the next twenty years.

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GOLD, GELD, GILT : FUTURE SUPPLY AND DEMAND

GOLD IN 1979

When the Pharaoh Tutankhamen, lying in a golden sarcophagus, surrounded by scores of gleaming golden artifacts, went to his tomb in Egypt's Valley of the Kings more than 3000 years ago, humanity's romance with gold was already a long affair.

– Vincent Buranelli (1979)

The romance continues, but, unlike most long-term affairs, the ardour has waxed, not waned. After an extended period of a quiet, low-level relationship, a sudden resurgence of passion in 1972 rekindled the flames of Man's desire for gold. In the eight years since then, the enamourment has teetered and tottered upwards to heights never before reached. In the rare air of inflamed infatuation, the question is justified : can the torrid affair continue or will gold cease to sirenize the suitor? Two decades from now, will politics and economics, supply and demand, fad and fancy, inflation and infirmation have placed gold on a still-more-elevated pedestal or relegated it to a *fin de siécle* feretory?

Whether or not gold continues to allure depends on the future of geld and the future of gilt, which two aspects of the use of the metal are amplified in Figure 1. In 1979, total gold consumption by all countries

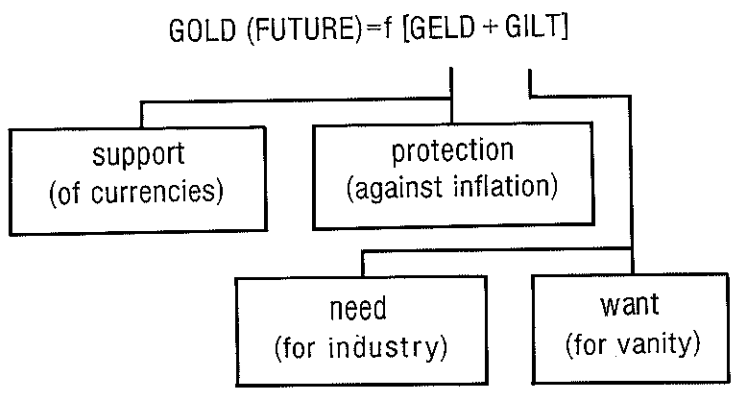


Figure 1 : The main uses of gold

amounted to 1 765 metric tons, of which 773 tons (43,8 percent) were absorbed by geld and 992 tons (56,2 percent) by gilt (Figure 2). By far the greatest demand for gold was for the jewellery-making industry, while second place, a long way behind, went to private purchases of bullion ostensibly to serve as a protection against inflation. Although no gold was reported as being officially employed for the support of currencies, acquisitions by Central Banks could certainly have served this purpose indirectly.

How was this demand for gold met in 1979? Total output from mining operations accounted for 1 380,6 metric tons. The shortfall of approximately 385 tons was met mainly by sales of gold held by the United States Treasury and by the International Monetary Fund. Production thus amounted to only 78 percent of demand. The more important contributors of World gold production in 1979 are shown in Figure 3. Output figures for China and for Communist countries other than the U.S.S.R. have not been included in this diagram. Caution has to be exercised in the acceptance of the figure for the U.S.S.R., since no official data are made available by this country, and the output represents the best estimate that can be made in the absence of concrete information. The true position, if this were ever revealed, could be substantially different. The dominance of South Africa and the U.S.S.R. is readily apparent in this figure and in Figure 4, which ranks the 18 more significant individual countries for which production figures for the year could be determined. The total South African and Russian output amounted to about 81 percent of that of the World, with the South African figure being a little less than twice that for the U.S.S.R. Canada, as the World's third most-important gold-mining country, lagged very far behind the leaders of the field, having contributed less than 4 percent. Figure 4 also reveals that the continent of Africa supplied almost twice as much gold as the U.S.S.R., while the North American and South American continents were of about equal importance, together accounting for 11 percent of the World figure. Combined output for all the other continents was approximately 6 percent.

The importance of South Africa is further illustrated in Table 1, in which individual producers have been ranked, according to their output in 1978. Of the first 15 positions, 12 are held by South African mines. Surprisingly, the largest producer in the World is not in South Africa, but in the U.S.S.R., at Muruntau, where an estimated 80 metric tons of gold were won in 1978. The most outstanding supplier in South Africa was the Vaal Reefs Mine, from which 67,4 tons of gold were extracted. The other non-South African contributor among the first 15 was Bougainville, in Papua-New Guinea, where gold was recovered as a by-product from a porphyry copper deposit. In the right-hand side of Table 1, after Muruntau and Bougainville, the leading producers, and their ranked positions overall in the World, are listed for each important gold-mining country.

1979: END–USES OF GOLD (METRIC TONS)

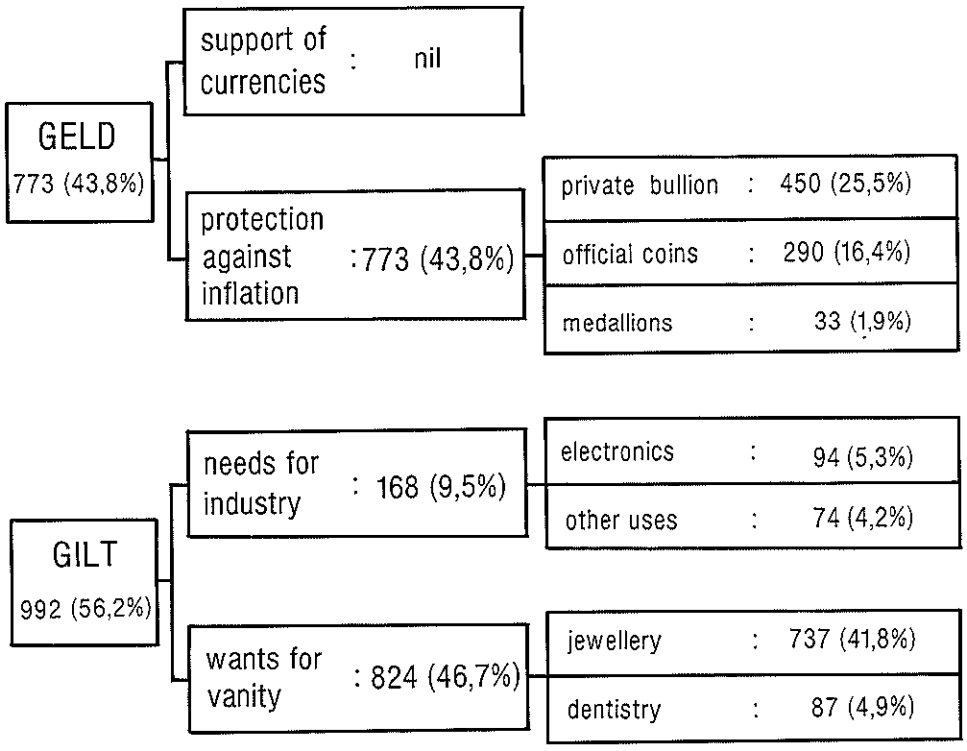


Figure 2 : The end-uses of gold in 1979.

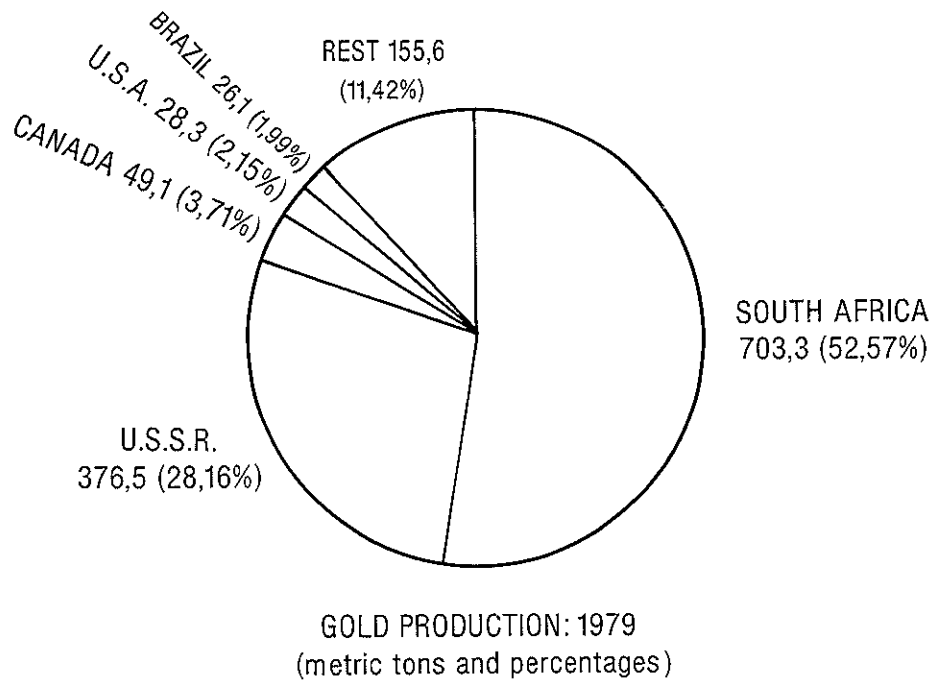


Figure 3 : Sources of World gold production in 1979. Outputsfrom China and Communist countries other than the U.S.S.R. are not included. Total World production : 1 380,6 tons. Production shown in figure : 1 338,9 tons.

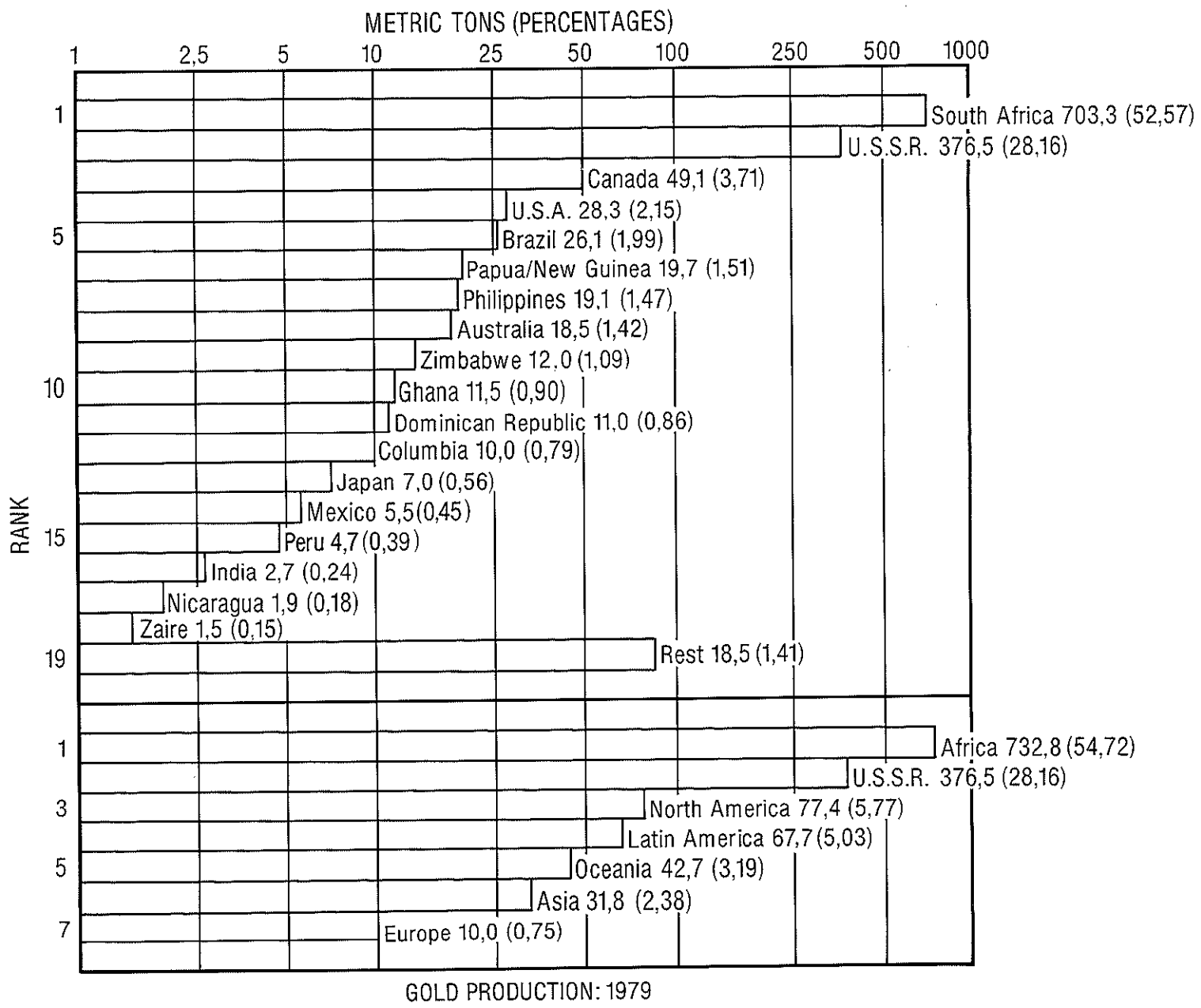


Figure 4 : Gold production in 1979, according to ranked individual countries and to continents. Production from China and Communist countries other than the U.S.S.R. has not been taken into consideration.

RANKED INDIVIDUAL GOLD PRODUCERS : 1978

		metric tons			*metric tons*
2.	Vaal Reefs (Klerksdorp)	67,4	1.	Muruntau (U.S.S.R.)	80,0
3.	West Driefontein (Carletonville)	56,0	13.	Bougainville (P.N.G.)	23,4
4.	East Driefontein (Carletonville)	52,4	26.	Ashanti (Ghana)	11,3
5.	Western Deep Levels (Carletonville)	45,7	27.	Pueblo Viejo (Domin. R.)	10,9
6.	Free State Geduld (Welkom)	43,1	29.	Homestake (U.S.A.)	9,5
7.	Western Holdings (Welkom)	33,1	33.	Kennecott (U.S.A.)	6,8
8.	Hartebeestfontein (Klerksdorp)	32,6	34.	Carlin (U.S.A.)	6,7
9.	Harmony (Welkom)	32,4	35.	Philex (Philippines)	6,1
10.	President Brand (Welkom)	30,0	37.	Campbell Red Lake (Canada)	5,9
11.	Buffelsfontein (Klerksdorp)	28,6	40.	Telfer (Australia)	4,5
12.	President Steyn (Welkom)	26,6	47.	Morro Velho (Brazil)	3,5
14.	Western Areas (Carletonville)	23,2	69.	Falcon (Zimbabwe)	1,7

Total World Production - 1978 : 1351,2 *metric tons*

Table 1 : Ranking of individual gold mines, according to their production in 1978.

The scale of gold-mining operations in South Africa in 1979 can be seen in Table 2. To have gained itself the leadership of the World, the industry has had to build itself up into a mammoth undertaking, which can be appreciated in the economics of exploitation. In making a comparison with the figures for 1978, the effect of the rise in the price of gold is obvious. Despite the fact that there was a slight decrease in the actual volume of gold produced, the working revenue showed a spectacular increase, leading to an even more impressive enhancement of the profits made by the South African mines. In the 1970's, there was a progressive decline in the output of gold from the country, but its proportion of the World's gross yield still remained so high that there could be no gainsaying the dictum : "As South Africa goes, so the World goes". The future of the World's gold supplies will be determined, in very large measure, by the future trend of the South African gold-mining industry.

SOUTH AFRICAN GOLD MINING INDUSTRY IN 1979

		% Change Over 1978	
Tonnage milled	83 529 000 metric tons	+ 6,9	92 075 000 short tons
Gold produced	702 830 kg	- 0,2	22 596 629 oz.
U_3O_8 produced	5 539 metric tons	+ 22,2	12 211 610 lbs.
Average grade	8,19 gms/ton	- 7,5	0,24 oz./ton
Costs per ton milled	R30,18	+ 11,2	$35,59
Working revenue	R5 666 mill.	+ 46,7	$7 366 mill.
Total profit	R3 537 mill.	+ 70,6	$4 598 mill.
Tax and state share	R1 703 mill.	+ 81,7	$2 214 mill.
Capital expenditure	R689 mill.	+ 53,7	$896 mill.
Dividends	R963 mill.	+ 76,2	$1 252 mill.

Table 2 : Production and economic statistics of the South African gold-mining industry in 1979.

GOLD IN THE SEVENTIES

Study the past, if you would divine the future.

- Confucius (551-479 B.C.)

The one possible base that might be employed on which to stand bold enough to look to the future of gold in the closing two decades of the 20th Century might be constructed on the trends of supply of, and demand for, the metal in the 1970's. The relative stagnation of the market, which had prevailed through the 1950's and the 1960's, was rudely and relentlessly redressed as South African gold production reached its peak in 1970 and then started a distressing decline and as the OPEC countries introduced a natural resource, in the form of oil, into the game of international politics.

In Figure 5 is shown the trend of gold production, between 1950 and the end of 1979, from South Africa and from the World, excluding the Soviet Union and other Communist countries. The influence of changes in South Africa output on that of the rest of the Western World is strikingly obvious. The rate of decrease in production from 1970 to 1977 was slightly steeper than the rate of increase from 1952 to 1966. A point of possible significance is that, although South African output has continued to diminish, at a much slower rate, since 1977, that of the Western World has shown a slight upward trend, since 1975, suggesting that South African influence on overall production is beginning to show signs of waning, to a very limited degree.

Since 1975, total World output has displayed a somewhat more clearly-recognizable divergence from the South African trend, as can be seen in Figure 6. This has been brought about by the steady escalation in the amount of gold being won in the U.S.S.R. By 1974, the gap between South African and Russian production, which was substantial in earlier years, had been reduced conspicuously. Despite the improvement in the Russian contribution to total supply, it was the trend in South African output that still exercised the greatest degree of influence on the patterns of production in the Western World and in the whole World, as the decade of the

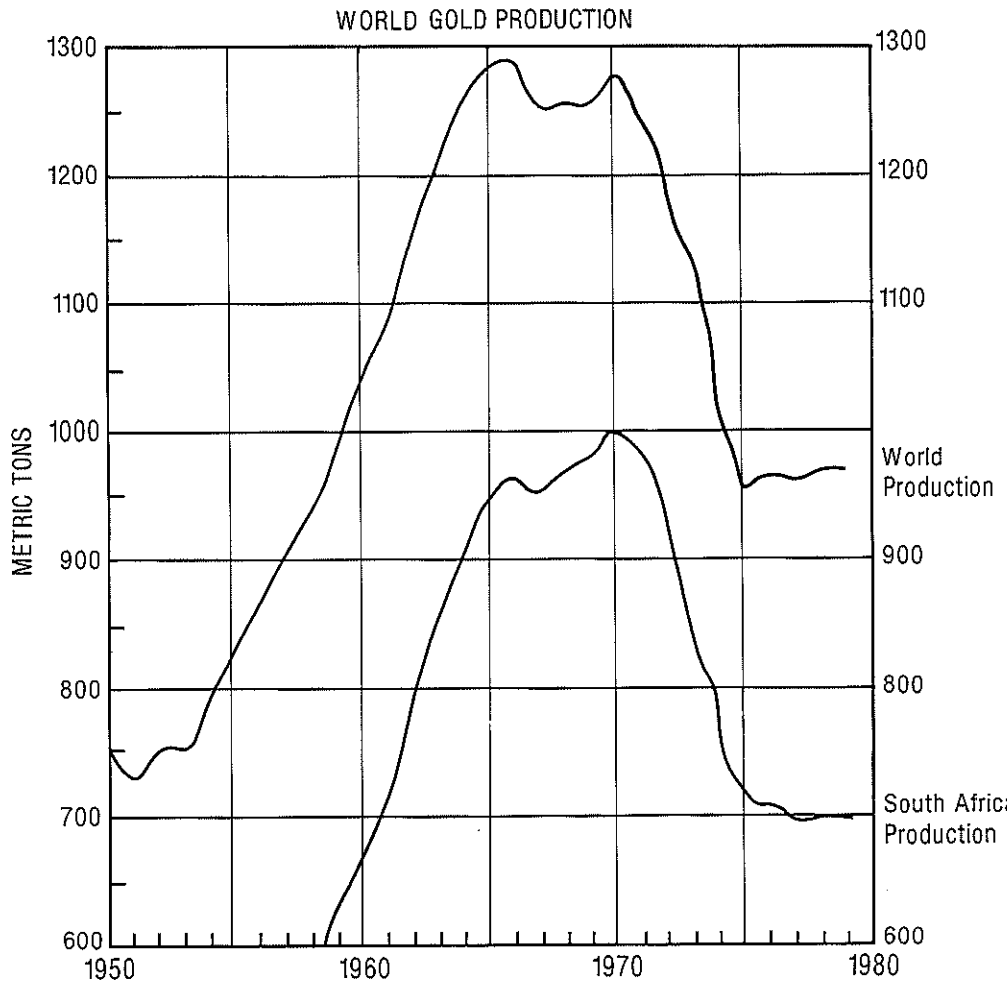


Figure 5 : Production of gold, between 1950 and 1979, from South Africa and from the Western World. Total production does not include output from the U.S.S.R., China, and other Communist countries.

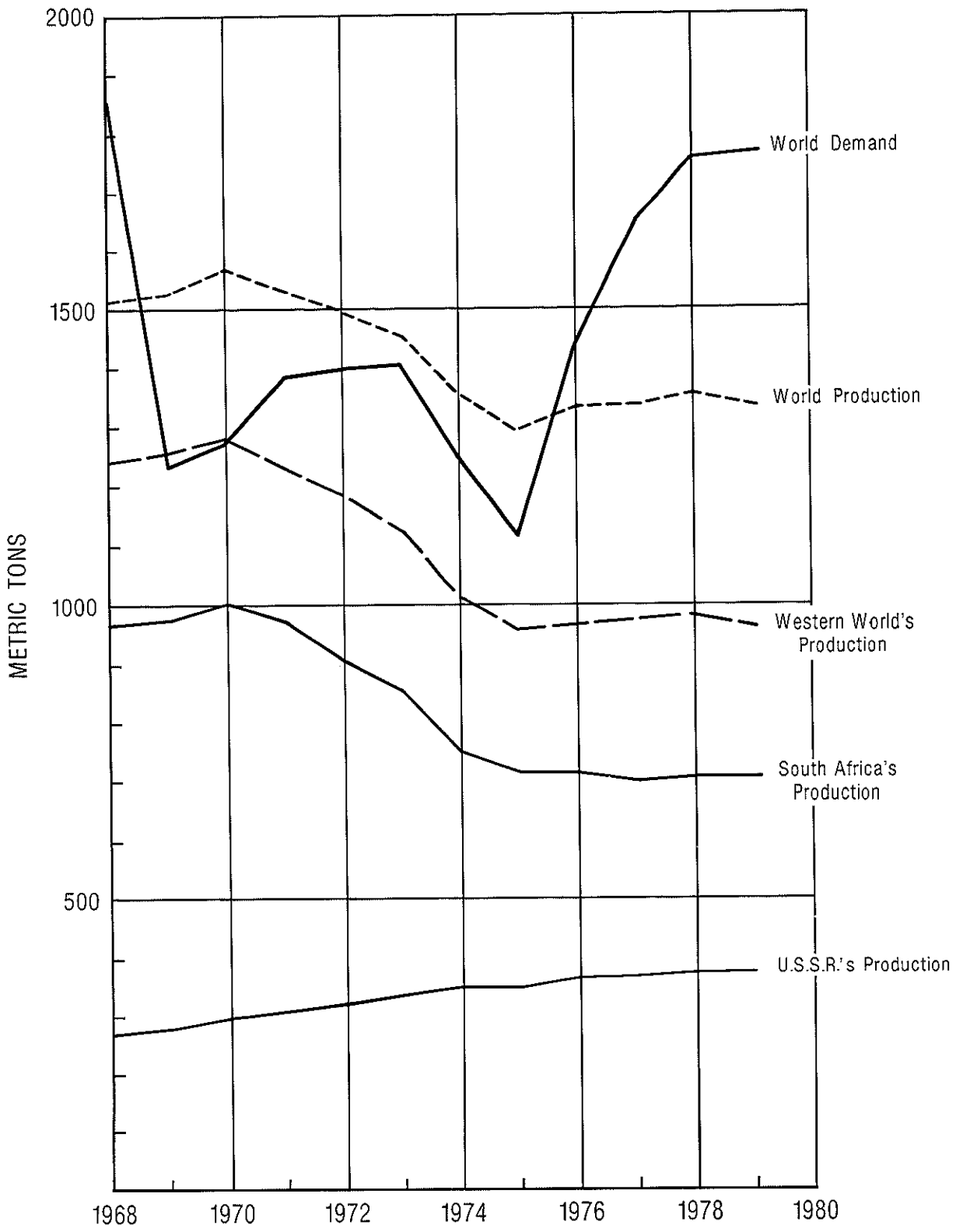
1970's ended. The much more irregular fluctuation in World demand for gold is discernible in Figure 6. The drop in total production from 1970 to 1975 was matched, in a crude fashion, by a lowering in demand between 1969 and 1975. When the downward trend was reversed from 1976 onwards, there was a marked upsurge in demand, to the extent that an ever-increasing deficit between output and demand developed.

The most important contributing factor to the ups-and-downs in demand lies in the amount of gold which is purchased for the manufacture of carat jewellery. Variations in the price of gold have a magnified effect on the sales of the metal to the jewellery trade. In Figure 7, the rise in price to $160 in 1974 caused the demand for carat jewellery to plummet from 500 metric tons, in 1972, to 115 tons, in 1974. When the price fell back to $120, in 1976, demand went up to 475 tons. An acceleration in price to $300 per ounce, in 1979, immediately brought the demand down to 360 tons. The antipathetic relation between price and the amount of gold purchased by the jewellery industry is an element that has to be given considerable weight in attempting to predict the trend of future supply and demand. In that a fair amount of gold jewellery was acquired as a hedge against inflation, it is possible that, with official gold coins now available in much larger quantities than in the past, the drop in demand for gold for jewellery might be compensated for, to a certain extent, by a rise in the demand for coins.

The information which has been portrayed graphically in Figures 5, 6, and 7 has been quantified in Tables 3 and 4, setting out the changes between 1970 and 1979, in the production of, and the demand for, gold. The major producers, with the exception of Brazil, show large decreases, ranging from 48 percent, in the case of the U.S.A., to 30 percent, in the case of South Africa. In this ten-year period, the output from South Africa declined by almost 300 metric tons. Increased gold production was most marked in Brazil and Papua-New Guinea. By continents, African output diminished by 30 percent and North America by 40 percent, while that for Latin America (South and Central) went up by 90 percent and that for Oceania by 80 percent.

The opposing trend for the Communist countries and the non-Communist World is apparent in Table 4. Output from the former increased from 365 metric tons, in 1970, to 418 tons, in 1979, a gain of 53 tons, equivalent to 15 percent. For the non-Communist contributors, output declined from 1 273 metric tons to 962 tons, a loss of 311 tons, equivalent to 25 percent. World production was reduced from 1 638 tons to 1 380 tons, a loss of 258 tons. While the total amount of newly-mined gold diminished by 15 percent, World demand was magnified by 40 percent, from 1 271 tons in 1970, when output was 367 tons greater than demand, to 1 765 tons in 1979, when production was 385 tons short of the amount purchased.

The deficit between output and demand, which developed from 1976 onwards, was one of the contributing factors to the rapid acceleration in the price of gold, which commenced in the same year, as is evident in



GOLD SUPPLY AND DEMAND: 1968–1979

Figure 6 : Supply of newly-mined gold and demand for gold from all sources for the period 1968–1979.

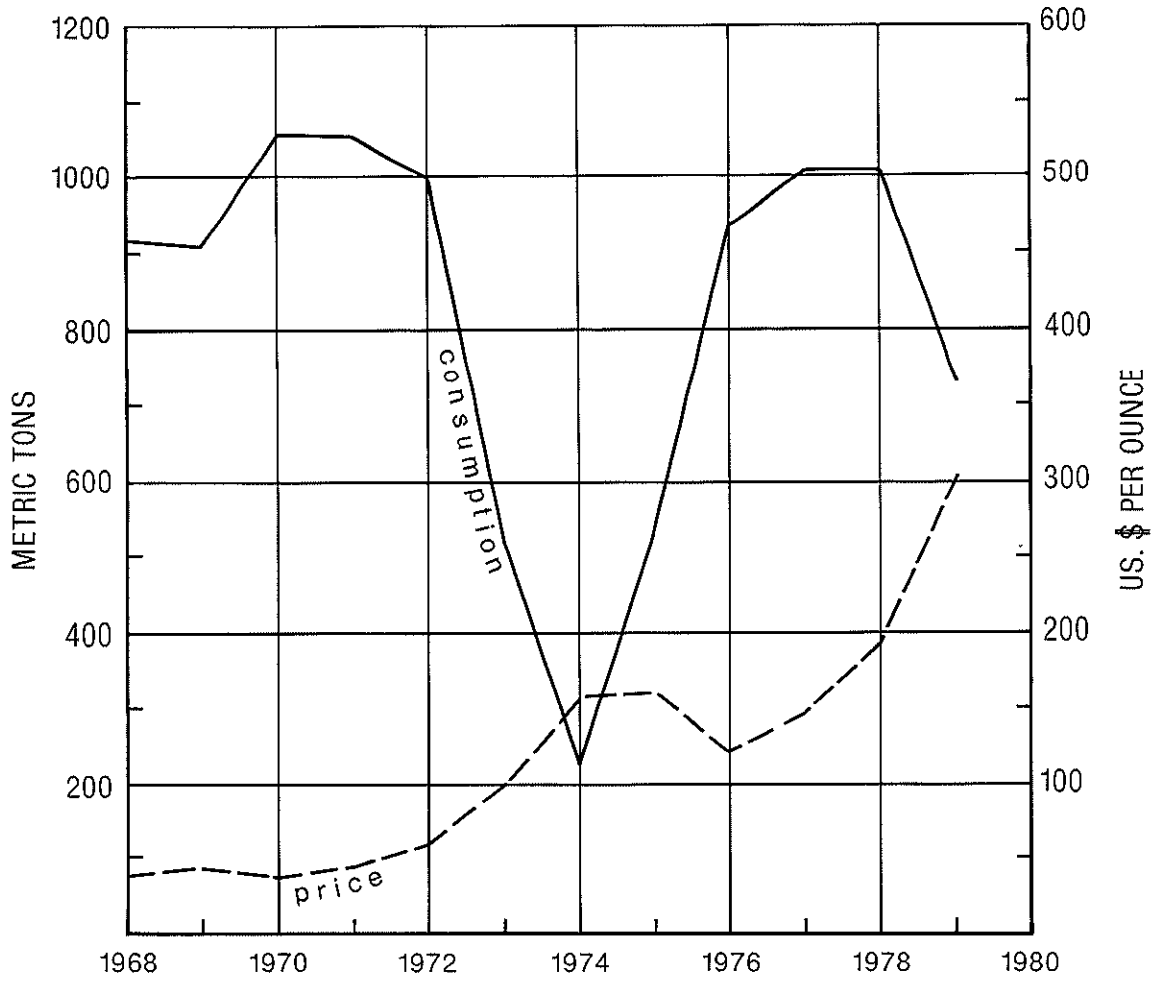
Figure 8. The price started to rise noticeably in 1972, surged upwards conspicuously between 1973 and 1975, in response to the beginnings of the oil crisis, and then fell back, before starting the steeper upward climb in 1976, which culminated in the extraordinarily high prices of the latter part of 1979 and the early months of 1980.

In real terms, gold started asserting itself in 1970, after a long period, going back before 1950, during which the price went progressively down, in terms of the 1980 U.S. dollar (Figure 9). Up to the end of 1979, the metal was still improving its true value, despite setbacks in 1975-1976, the time-slot between the end of the shock of the first round of oil-price increases and the beginning of the realization that inflation was assuming distressing proportions. As the economies of the Western World went over the edge on their downward slide, so gold, as geld, started its ascent, aided to a more variable extent by gold, as gilt. In the future, the role of jewellery, as a gilt-disguised form of geld, might be usurped by official coins.

The story of gold in the 1970's can be summarized into five points :

(i) a steep decline in output from the non-Communist countries, particularly from South Africa;

(ii) a gradual increase in the output of the Communist countries, especially of the U.S.S.R.;



GOLD USED FOR CARAT JEWELLERY AND PRICE OF GOLD: 1968–1979

Figure 7 : *Relation between the price of gold and the consumption of the metal in the manufacture of carat jewellery.*

(iii) A nett decrease in total World production of 15 percent between 1970 and 1979;

(iv) an increasing deficit between supply and demand from the middle of the decade onwards, with demand in 1979 being 40 percent above what it was in 1970; and

(v) an accelerating upward trend in the price of gold.

GOLD TO THE END OF THE CENTURY

Don't ever prophesy - unless
you know.

- James Russell Lowell (1819-1891)

Uncertainty has to be attached to all aspects of predicting the courses of supply of, and demand for, gold, if for no reason other than that the economies of all nations will be sailing through turbulent waters for the remaining two decades of the 20th Century. What production can be attained is dependent, in the first instance, on the reserves and resources of gold that are available. What proportions of these can be mined economically will be determined by the trends in working costs and in the price of gold. And, the price of the metal will be a response to the difference between supply and demand and to the degree to which national economies engender optimism, pessimism, or resignation to a system out of control. The greater the array of variables influencing the availability of, and the market for, gold, the less confidence can be attached to any attempt to forecast the future, short-term or long-term. As the intrigues and intricacies of international politics multiply, in a world seldom, if ever, devoid of conflict and confrontation, so the politico-economic variables will assume the form of a hydra-headed harridan of the most unpredictable mien.

In the estimates, predictions, guesses, and conjectures which follow, an attempt has been made to produce weighted means of many forecasts made by experts, advisers, authorities, charlatans, amateurs,

CHANGES IN GOLD PRODUCTION : 1970-1979

	1970	1979	Change	% Change
South Africa	1000,4	703,3	-297,1	- 30
Canada	74,9	49,1	- 25,8	- 34
U.S.A.	54,2	28,3	- 25,9	- 48
Ghana	21,9	11,5	- 10,4	- 47
Australia	19,5	18,5	- 1,0	- 5
Philippines	18,7	19,1	+ 0,4	+ 2
Brazil	9,0	26,1	+ 17,1	+ 190
Papua/New Guinea	0,7	19,7	+ 19,0	+2710

Table 3 : Changes in annual output of gold, between 1970 and 1979, of the major gold-producing countries in the Western World.

CHANGES IN WORLD GOLD PRODUCTION AND DEMAND : 1970-1979

	1970	1979	Change	% Change
Africa	1044,8	732,8	-312,0	-30
North America	129,1	77,4	- 51,7	-40
Latin America	35,4	67,4	+ 32,0	+90
Oceania	23,8	42,7	+ 18,9	+80
Asia	33,1	31,8	- 1,3	- 5
Europe	7,4	10,0	+ 2,6	+35
Non-Communist World	1273,6	962,4	-311,2	-25
Communist Countries	365,1	418,2	+ 53,1	+15
World Production	1638,7	1380,6	-258,1	-15
World Demand	1271,4	1765,8	+494,4	+40

Table 4 : Changes in World production of, and demand for, gold between 1970 and 1979, according to continents and political affiliations.

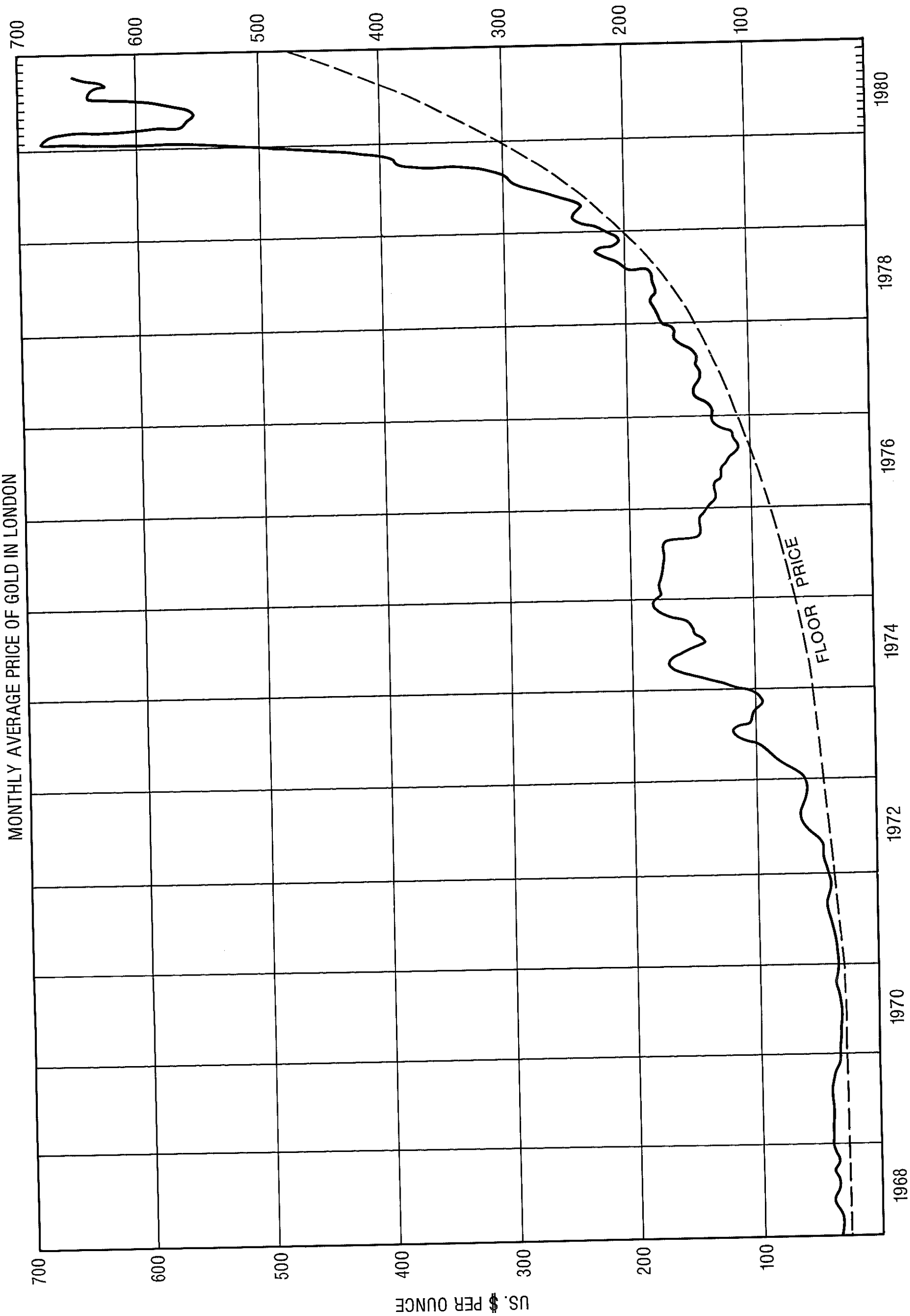


Figure 8 : *The monthly average price of gold in London between 1968 and 1980.*

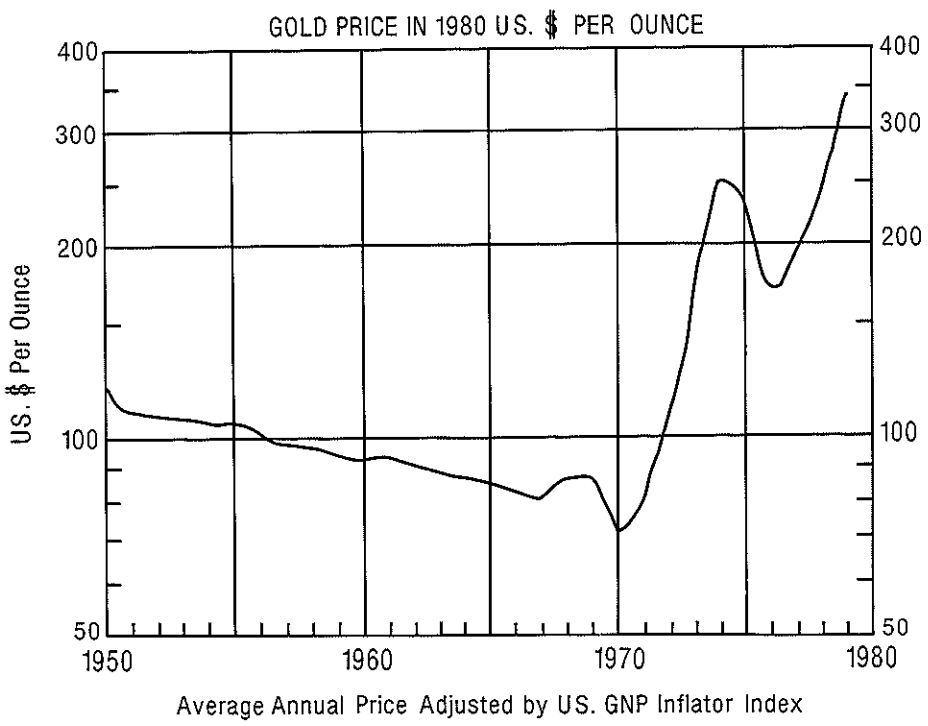


Figure 9 : The price of gold in real terms, expressed in 1980 United States dollars, after adjustment by means of the U.S. Gross National Product Inflator Index.

professionals, inspirees, and ignorami. And, like all means, they might be meaningless. The 1970's saw a mushrooming of opinions proclaiming on the future of gold, particularly in respect to its price. Greater weight has been given to the analyses of the more knowledgeable seers, such as Dennis Etheredge, of Johannesburg, Paul Kavanagh, of Toronto, and Hans-Joachim Schreiber, of Frankfurt, and to the information supplied by such reputable institutions as the Chamber of Mines of South Africa and Consolidated Gold Fields Limited, of London. But, the views of lesser voices and smaller organizations, in many countries, have also been taken into consideration in the compilation of possible trends in the supply of, and demand for, gold in the years between 1980 and 2000.

In Figure 10 are shown estimates of the World's reserves and resources of gold, as determined in 1979. For the reserves, the price of gold has been assumed to average $500 per ounce over the next two decades, for the resources $600 per ounce. Of the 40 000 metric tons of reserves, South Africa is thought to hold 47 percent and the U.S.S.R. 21 percent, with the U.S.A. in third position, hosting 11 percent. The same ranking applies to resources, which might be of the order of 60 000 metric tons. As they have dominated production in the first three decades of the second half of the 20th Century, so South Africa and Russia stand very far ahead of the rest of the World with respect to reserves and resources.

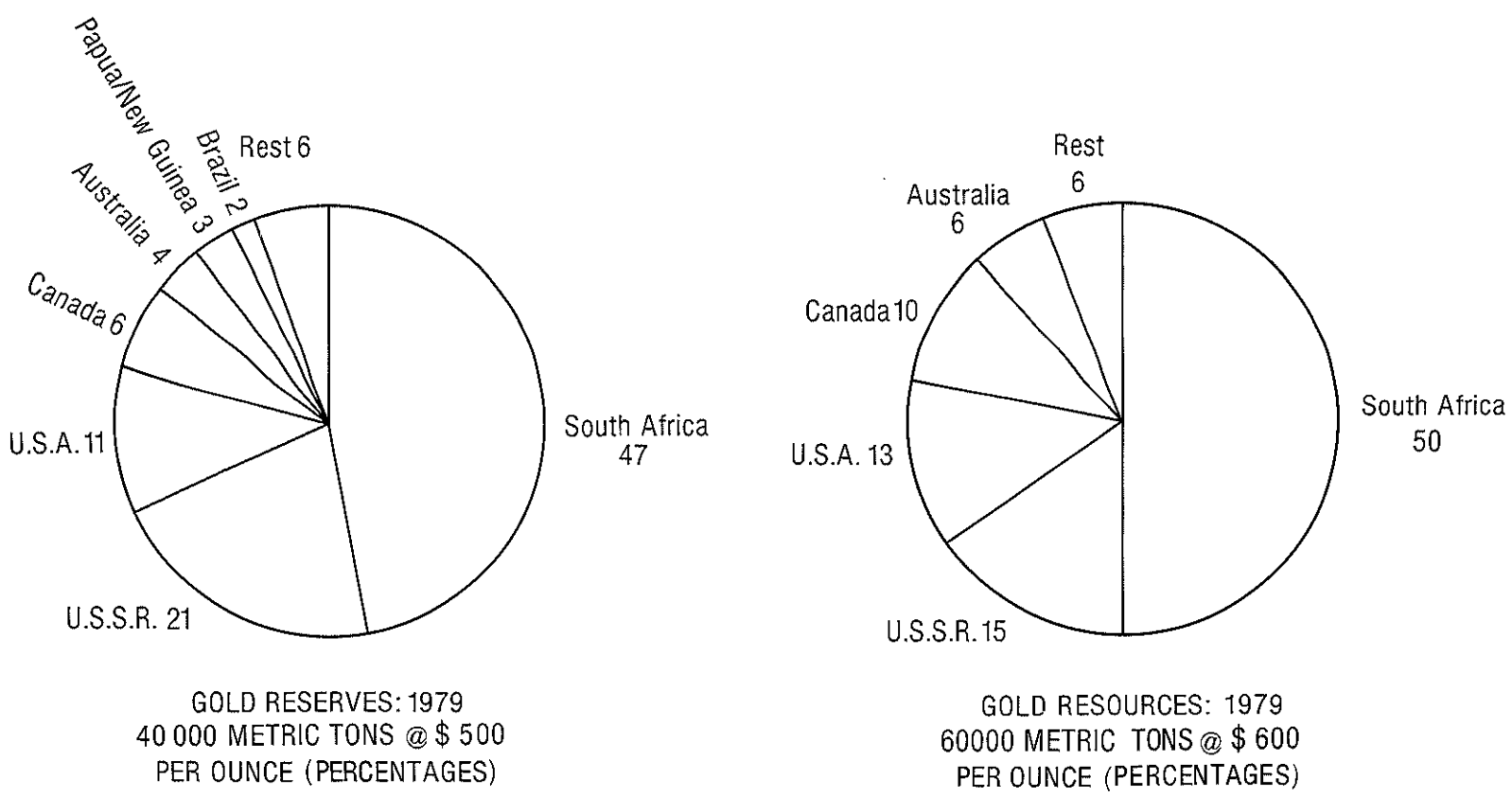


Figure 10 : The World's gold reserves and resources, as determined in 1979, employing assumed average prices, over the next two decades, of $500 and $600 per ounce, respectively.

The shortfall between demand and output, which started in 1976, is considered, by concensus, to be likely to continue up to the end of the century (Figure 11). The peak in demand is shown as occurring in 1990, while production is forecast as reaching its peak in 1995. Both demand and output show a relatively-steep decline from the latter year into the next century, with demand diminishing at a somewhat slower rate than output, thereby enhancing the deficit between the amount of newly-mined gold and the volume required by potential purchasers.

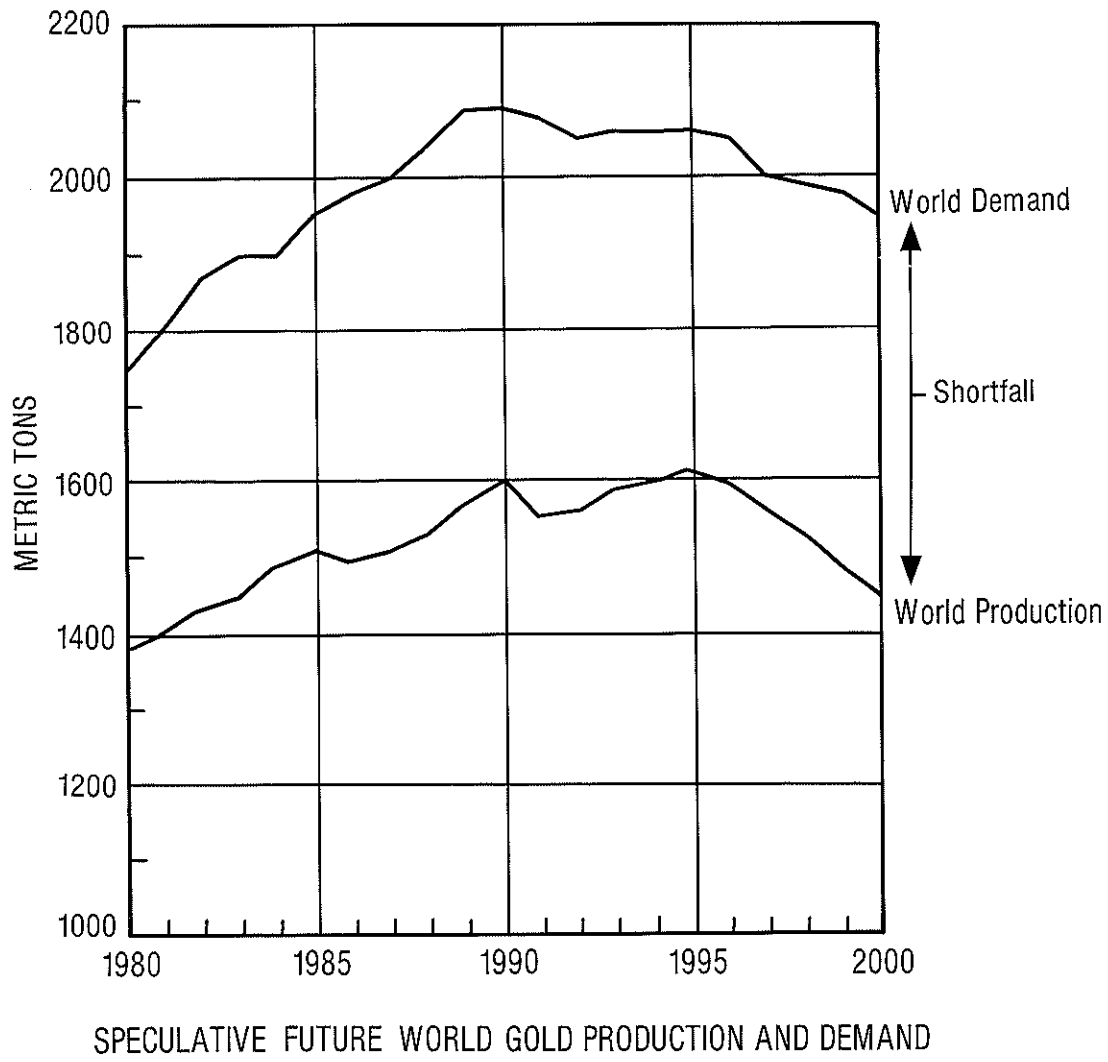


Figure 11 : Speculative projection of total World production of, and demand for, gold from 1980 to 2000.

The most comprehensive projections have been undertaken for the output of gold from South Africa. At an assumed average price of $350 per ounce over the next 20 years, it has been estimated that there will be a steady, gradual increase in the total amount of gold won, from a figure of 703 metric tons in 1979 to 730 tons in 1987. Thereafter, a sharp decrease is anticipated to 380 tons in 2000 and 350 tons in 2040. Production for 1980 showed a deviation from this projection, in that the output for the year was approximately 674 tons, almost 30 tons less than the 1979 yield, instead of being the expected more than. The departure from the anticipated was influenced, to a certain extent, by the gold price averaging over $600 for the year. Nevertheless, at an assumed average of $650 per ounce, the forecast still indicates an upward trend to a peak of 710 tons in 1987 and, thereafter, a fall to 410 tons in 2000 and 330 tons in 2040. The overall pattern is not altered by basing the prediction on an average price of $1 200 per ounce. A peak of 690 tons is thought possible in 1987 and a slide to 420 tons in 2000 and 350 tons in 2040. With respect to the number of mines in full operation, the projection reduces the figure from 40 in 1980 to 30 in 1987, to 26 in 1990, to 17 in 1995, to 10 in 2000, to 4 in 2010, and to 2 in 2020. These forecasts have been made on the assumption that no new goldfields will be discovered in the remaining two decades of the century, but that several new mines will come into production in the existing goldfields.

These projections carry a most disturbing implication for the whole question of supply-and-demand of gold up to the year 2000. If the annual production of the World's most significant supplier of newly-mined gold is to fall to half of what it was in 1979, then it is only sensible to deduce that the whole status and structure of the gold market will change drastically. Figure 12 illustrates graphically the effects of a marked decline in South African production on the total availability of the metal in the World and on the politico-geographic sources of gold. This projection indicates the peak of the trend of South African production, in the post-1976 period, as occurring in 1985, not 1987. The maximum output of the Western World is in the same year, since South African production constitutes such a large proportion. Total World production continues to rise, through 1985, to 1995, in response to Russian output overtaking South African in 1992. Increased production from other Communist countries, namely from China, further enhances the ascendancy of Communist output over that of the non-Communist countries. It is forecast that a decline in total Communist output will occur from 1994, essentially as a result of a downward trend in Russian production.

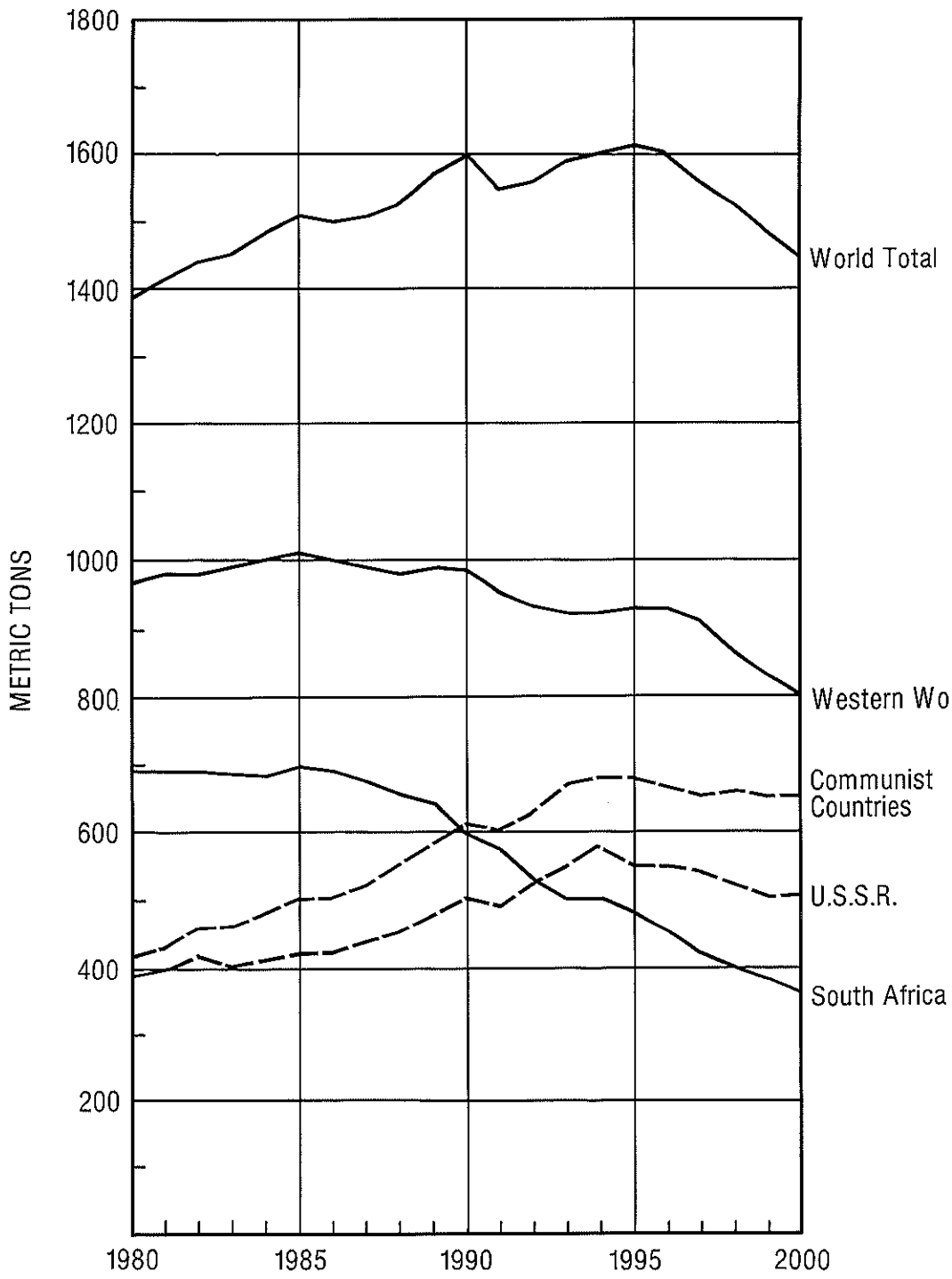


Figure 12 : Speculative projection of future gold production, from 1980 to 2000, from South Africa and the U.S.S.R., and from the Western World and the Communist World.

The more compelling conclusion that can be drawn from the production estimates is that the period between 1985 and 1995 will see revolutionary changes in the trends and patterns of gold supply to the marketplace. Firstly, South African and Western World output will start a pronounced downward slide in 1985. Then Russian production will overtake South African in 1992. And, finally, total World output will start falling off in 1995. By the year 2040, the gold story will be a very different tale to what it was in 1979, and the writing of the saga will be in Cyrillic, not Latin, characters.

Some of the contributing factors to Figure 12 are listed in Tables 5 and 6. South African gold production is anticipated as decreasing by 50 percent, from 703 metric tons, in 1979, to 360 tons, in 2000. At the end of the century, the output might be only 25 percent of the total World figure, instead of the 51 percent it was in 1979. Increased production is thought possible from all the major producers in the Western World, with the exception of Ghana. In the year 2000, the Canadian contribution might have increased to 10 percent of World production, from 4 percent in 1979, and the American to 6 percent, from 2 percent. Output from non-Communist countries could possibly fall from 70 percent of the whole World's to 55 percent. What is readily apparent in Table 5 is that, despite the projected increases in annual production from Canada, the U.S.A., Brazil, and Australia, essentially as a result of the expected upward trend in the price of gold, the additional amounts of the metal won from these countries cannot come close to compensating for the fall-off in South African production. Consequently, it is thought that total Western World output at the end of the century will have decreased by 17 percent, from 962 tons, in 1979, to 800 tons, in 2000.

Projections for the Communist World reveal markedly different directions (Table 6). It is estimated that output from the Soviet Union will increase by 35 percent, from 377 tons, in 1979, to 510 tons, in 2000, while that from China could improve by 330 percent, from 30 tons to 130 tons. Overall, output from the

SPECULATIVE FUTURE GOLD PRODUCTION (METRIC TONS AND PERCENTAGES)
IN WESTERN WORLD TO YEAR 2000

	RSA	CND	USA	BRZ	AUS	RWE	WEW
1979	703(51)	49(4)	28(2)	26(2)	18(1)	138(10)	962(70)
1985	695(46)	70(5)	40(3)	35(2)	30(2)	135(9)	1005(67)
1990	595(37)	100(6)	70(4)	40(3)	50(3)	130(8)	985(61)
1995	480(30)	150(9)	70(4)	45(3)	60(4)	125(8)	930(58)
2000	360(25)	140(10)	80(6)	50(3)	50(3)	120(8)	800(55)
% Chg	-50	+185	+185	+90	+175	-15	-17

RSA = South Africa CND = Canada USA = U.S.A.
BRZ = Brazil AUS = Australia RWE = Rest of West
WEW = Total for Western World %Chg = 100(2000-1979)/1979

Table 5 : *Speculative projection of gold production, between 1979 and 2000, from the major gold-producing countries in the Western World.*

Communist countries is anticipated to rise by 56 percent, from a total of 418 tons, in 1979, to 650 tons, in 2000. An enhancement of Communist World production by 56 percent and a diminution of Western World output by 17 percent result in the possibility that total World production in 2000 will be 5 percent higher than it was in 1979, the amounts being 1 450 tons and 1 380 tons, respectively.

SPECULATIVE FUTURE GOLD PRODUCTION (METRIC TONS AND PERCENTAGES)
IN COMMUNIST WORLD TO YEAR 2000

	USR	CHN	RCO	COW	WEW	TWP
1979	377(27)	30(2)	11(1)	418(30)	962(70)	1380(100)
1985	420(28)	70(4)	10(1)	500(33)	1005(67)	1505(100)
1990	500(32)	100(6)	10(1)	610(39)	985(61)	1595(100)
1995	550(34)	120(7)	10(1)	680(42)	930(58)	1610(100)
2000	510(35)	130(9)	10(1)	650(45)	800(55)	1450(100)
% Chg	+35	+330	-10	+56	-17	+5

USR = U.S.S.R. CHN = China RCO = Rest of Communist World
COW = Total for Communist World WEW = Total for Western World
TWP = Total World Production % Chg = 100(2000-1979)/1979

Table 6 : *Speculative projection of gold production, between 1979 and 2000, from the Communist World.*

The changing roles of the Communist World and the Western World are summarized in Table 7, in which is also given an estimate of the trend in the demand for gold during the next two decades. The deficit between the availability of newly-mined gold and the demand for the metal might increase by 30 percent, from 385 tons, in 1979, to 500 tons, in 2000, as a result of a possible increase of 10 percent in the amount of gold sought by buyers, from 1 765 tons, in 1979, to 1 950 tons, in 2000. Production and demand will both be on downward trends from peaks, occurring between 1985 and 1995, when the end of the century is reached, but the shortfall between the two could well be increasing, to a certain extent.

SPECULATIVE FUTURE WORLD GOLD PRODUCTION AND DEMAND

(METRIC TONS AND PERCENTAGES) TO YEAR 2000

	Western World	Communist World	World Production	World Demand	World Shortfall
1979	962(70)	418(30)	1380(100)	1765	385
1985	1005(67)	500(33)	1505(100)	1955	450
1990	985(61)	610(39)	1595(100)	2095	500
1995	930(58)	680(42)	1610(100)	2060	450
2000	800(55)	650(45)	1450(100)	1950	500
% Chg	-17	+56	+5	+10	+30

Table 7 : *Speculative projections of gold production, between 1979 and 2000, from the Western World, the Communist World, and the whole World and of the total World demand for gold.*

GOLD : COMMOTIONS AND COUNTERMEASURES

Though wisdom cannot be gotten for gold,
still less can it be gotten without it.

- Samuel Butler (1835-1902)

Since the middle of the 19th Century, the Western World has occupied the prime position with respect to the production of gold. Between 1985 and 1995, it is anticipated that it might be relegated from this position, with output from the Communist countries progressively moving into the ascendancy. The change in the long-standing *status quo* will be brought about by the rapid decline in South Africa's production and a steady upward movement in the amount of the metal won in the U.S.S.R. This radical change, coupled with greater political instability throughout the World, deteriorating national economies, rampant inflation, and the persistent deficit between supply and demand, will support a long-term positive trend in the price of gold. Enhanced prices possibly will increase the amounts of newly-mined gold coming from the U.S.A., Canada, Brazil, and Australia, but, in the case of the South African mining industry, higher prices will not prevent the decrease in the volume of gold recovered. As the price rises, so lower-grade ore can be mined, with the result that the total amount of gold recovered from the treatment of tonnages, which will remain more or less constant, or show only small increases, because of the constraints on hoisting and milling capacities, will fall. The lives of the mines might be extended and the annual revenue from sales might be greater, but less gold will become available. Since production in Russia and China is less intimately geared to changes in price, the upward movement in the amounts of gold from these and other Communist countries can still be anticipated during times when inflated costs and a weak price might depress, still further, output from the Western World.

Within the first quarter of the 21st Century, it is estimated that total output of gold from the Communist countries will surpass that of the West, mainly as a result of the projected diminution in the amount of gold won in South Africa. Both the availability and the price of the metal would then be under the influence of the U.S.S.R., as a consequence of which it can be expected that manipulations of the gold market will be aimed at disrupting Western economies, to the benefit of the Communist World. It would seem that gold, within the next ten years, could become as an important a weapon in the resource war as oil. Constraints on the supply of the latter would cripple industrial development; a restricted availability of the former could destroy national economies.

The transition from Western to Communist domination of the World gold scene can be averted only by the West's increasing substantially its gold production within the next two decades. This would have to be done by revitalizing old mines, by expanding existing mines, by opening up new mines, and, particularly, by discovering new goldfields. It is in the last-mentioned development that the best hope lies for the gold market to remain sensitive to Western influence.

What is apparent is that the downward trends cannot be countered by greater gold production from the type of mineralization found in Archean greenstone terranes, such as host the most important mines in Canada, Western Australia, and Zimbabwe, or from the sort of ore-bodies that occurs in Phanerozoic volcanics and sediments, such as in the western United States, the eastern portion of Australia, or the circum-Pacific belt of porphyry copper deposits. Even the trebling of present production from such sources would not offset the anticipated effect of the decline of output from the mines in the Witwatersrand Basin in South Africa. Thus, the solution to the weakening of the Western World's status as a gold-producer would be the discovery of another

Witwatersrand-type depository in South Africa, Brazil, Australia, the United States, or Canada. Finding such mineralization is not without its rewards, as can be seen in Table 8. The Witwatersrand gold-mining industry is such a giant that its demise can be countered only by the generation of another giant of the same proportions and potential. If a Witwatersrand-type gold province is discovered in the Communist World, instead of in the Western World, then there is no way in which total control of the gold market can be prevented from passing into the hands of Russia, China, or some other Communist country.

1980 COSTS AND REWARDS : NORTH SEA OILFIELD VS. WITWATERSRAND GOLDFIELD

Brent Oilfield
- 100 million tons of recoverable reserves @ $30 per barrel
- worth $22 000 mill.
- cost of development $4 500 mill.
- worth:cost :: 5:1

Carletonville Goldfield
- 6 000 tons of recoverable reserves @ $500 per ounce
- worth $96 000 mill.
- cost of development $4 000 mill.
- worth:cost :: 24:1

Table 8 : The comparative costs and rewards, as determined for conditions in 1980, of exploring for and proving a North Sea oilfield and a Witwatersrand goldfield.

At the very minimum, a period of ten years would be required to explore for, discover, and start production from another Witwatersrand-type basin, if such is to be found. Possibly, at least 20 years would be necessary to establish adequate countermeasures to projected Russian dominance of the World gold-market in the first quarter of the next century. The urgency of intensifying exploration efforts aimed at discovering another Witwatersrand cannot be exaggerated. If the resource war is won by Russia, it will have no need to wage conventional war, in order to conquer the West. If the Western World cannot improve, to an appreciable extent, its reserves of gold-bearing ore, and effect that improvement before the close of the century, then it will have seen its prospects of survival decline in parallel with the projected downward trends in the availability of the object of Man's long, long love-affair.

Gold! Gold! Gold! Gold!
Good or bad a thousand fold!
How widely its agencies vary -
To save - to ruin - to curse - to bless.

- Thomas Hood (1799-1845)

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