



# Keynote Address:

## Commodity prices into the new millennium

by B.A. Day, R.J. Adey, and P.J. Day\*

### Synopsis

The traditional view taken of commodity prices is that they are cyclical, with strong demand boosting prices and attracting new suppliers. The resulting increased supply pushes prices down with consequent exit of the higher cost producers. And so the process repeats itself.

Little attention is given to shifts in underlying global issues and their effect on the traditional process which is seen as being controlled by 'amorphous' market forces with producers profiting from the good times and trying to survive in the bad.. The questions posed are: does this still apply and will it apply into the future? What new factors are affecting the cycles? Can we expect to find the traditional commodity cycles repeated in the 21st century? Are producers powerless within the forces of the cycles?

Forces likely to affect future commodity prices will be suggested, using gold, zinc, copper, tin and coal as case studies. The long-term downward trend in the real price of commodities is identified.

### The forecasting process—a necessary folly

The title of this talk suggests that forecasts will be made of prices that will apply as we move into the new millennium. This is indeed a dangerous path to travel. I will travel it and in doing so may make some contentious statements—if some of you agree with what I say and others disagree, even violently, then I believe that I will have succeeded. Let me start by giving you a definition of forecasting. Forecasting is the act of relating an event that has not occurred, is not occurring and will not occur. There is an old proverb that says 'an ounce of fortune is worth a pound of forecast'. The motor company Mercedes would agree with this if they looked back to a forecast made in 1900 when they predicted that there would never be more than a million motor cars worldwide. They had a very logical reason for this: it could not be expected that more than one million artisans could be trained as chauffeurs. Another person who would squirm with embarrassment if he looked back at a forecast made in 1943 is Thomas Watson, then

chairman of IBM, who uttered the prophetic words, 'I think there is a world market for maybe 5 computers'. Then there are the words of Victor Hugo who in the 1880s said: 'In the 20th century war will be dead, the scaffold will be dead, hatred will be dead, frontier boundaries will be dead, dogmas will be dead; man will live. He will possess something higher than all these—a great country, the whole earth and a great hope, the whole heaven'.

The Club of Rome, a very eminent body of academics, may also have reason to look back on the folly of forecasting. In 1972 they wrote about the imminent depletion of many commodities. They considered known global resources and various projected rates of usage. For instance, gold resources were forecast to be exhausted by the mid-1980s. Even if 5 times the known reserves as at 1972 were discovered, then gold would only be mined until the turn of the century. Zinc would have been mined out by the mid -1990s; copper by the late 1990s and oil before the start of the new millennium. The essential flaw in their reasoning was that they assumed that virtually all of the world's unexploited and economically viable resources had been identified. Obviously, since then the geologists have come into their own and given the lie to this view of scarcity.

Although forecasting is a hazardous business, it is essential to take some view on commodity prices if one is in the high-risk business of mining. The technical risks associated with mining and processing of ores can, to a large extent, be contained by using available expertise, by detailed research, by meticulous planning; but if a venture is to succeed, the final product has to be sold at a price that exceeds the total costs. This is a very simplistic statement but one that has all too often been forgotten.

\* *BBP Consulting, P.O. Box 29354, Melville 2109.*  
© *The South African Institute of Mining and Metallurgy, 2000. SA ISSN 0038-223X/3.00 + 0.00. Paper first published at SAIMM Conference, Metallurgy Africa '99, 1-2 Nov. 1999.*

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## Forecasting—past, present and future

Let us look at the traditional methodology of forecasting a commodity price. Unfortunately, there is no crystal ball. The economist will look at what has happened to the price in the past. He will look at demand and supply figures and consider views on the future economic cycle of growth and recession. The use of history, of past data, always features significantly in forecasting. In fact, Confucius said 'study the past if you would divine the future'. On the other hand in 1791 Edmund Burke wrote: 'you can never plan the future by the past'.

This is where our major problem lies. Before this century the past may well have been a blueprint for the future, but the 20th century has changed all that. The retail price index for England shown in Figure 1 takes the index in 1850 as 100. From 1650 to the early years of this century, there was little change. The Napoleonic Wars produced a few modest increases and then the 2nd World War started the sharp upturn that followed from 1950. We have, during this second half of the 20th century, moved firmly into the Information and Communication Age. Life is no longer as it was for our fathers and grandfathers. We are no longer sheep with a clear blueprint in life to follow.

Success in the game of life, now and into the new millennium, requires that those individuals who win, will, like never before, be characterized by their unique ability to understand the requirements of the future and also by their commitment to following new paths.

## Brave new world

As we use our cell phones, watch CNN and surf the net, it's very easy for us to accept the arrival of the Information Age. But just as we don't notice ageing in the face of someone we see every day, so it's often hard for us to appreciate just how much things have changed in the 20th century because we have lived through it.

To grasp the enormity of change, it is worth considering the writings of Alvin Toffler. He illustrated change by assuming that if we take the 50 000 years of man's existence and divide it into lifetimes of, say, 65 years, then there are about 800 such lifetimes. Of these, 650 lifetimes were spent in the caves. Only in the last 70 lifetimes has it been possible to communicate effectively from one lifetime to another—as

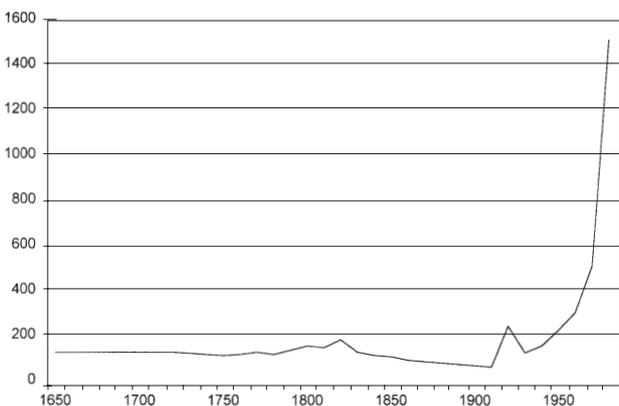


Figure 1—Retail price index for England (1850=100)

writing has made it possible to do. Only during the last 6 lifetimes have the masses seen the printed word. The economist Kenneth Boulding, at a lecture in 1966, said: 'The world of today is as different from the world in which I was born (he was born in 1910) as that world was from Julius Caesar's. I was born in the middle of human history. Almost as much has happened since I was born as happened before'. Change has been and still is happening so fast that it causes us to be stressed. Toffler coined the term 'future shock' to express this. Professionals in all fields feel concern that they are not 'keeping up' with all the latest advances in their fields. Of course, not everyone is concerned. Some people block out change, deny it exists and avoid any intrusions of the new at all. We can all think of people who steadfastly avoid computers or who get their 10-year-old to program the VCR. Even great scholars have blinded themselves to progress. On the day the Wright brothers made their first flight, newspapers refused to report it because they could not believe manned flight was possible. After all, a famous American astronomer, Simon Newcomb, had not long before assured the world 'no possible combination of known substances, known forms of machinery and known forms of force, can be united in a practical machine by which man shall fly long distances'. The great scientist, Rutherford, the discoverer of the atom, said in 1933 that the energy in the atom's nucleus would never be released—we all know what happened barely 10 years later.

What all this means to us is that the past is no longer a mirror of the future and that the future is more unpredictable than it has ever been before. In the fields of mining and minerals processing it is still essential to have some idea on the future prices of commodities sold. The taking of a long-term view on prices is needed to decide whether to develop a mine, expand production or construct a plant or smelter and the accuracy of this view is critical for success. However, rather than merely looking at the past, at supply and demand, and projecting this data into the future in line with economic growth, it is now necessary to consider a host of other trends and their effect on future prices.

## Some trends and their effect on markets

Most mineral commodities are subject to world prices, supposedly based on supply and demand balances within a free market. The latter is seldom as free as we like to think and manipulations can and do have enormous effects on prices.

The classical tale of manipulations is that of tin and the machinations of the International Tin Council. This body had its origins in the 1920s and its aim was to synchronise supply and demand so as to maintain price levels, particularly during the Great Depression. That sounds all very laudable, but the problem is that producers all have different costs of production and the ITC was committed to supporting all of its members, irrespective of their production costs. Eventually, in 1985, the ITC was bankrupt and left with large stocks of tin. The tin price collapsed and the market has never recovered to levels prior to this disaster. Even today, in nominal terms, the price of tin is less than that just after the complete collapse of the ITC in 1986. Figure 2 shows the real term tin prices over the last 40 years and presents a salutary lesson indeed not to meddle with markets.

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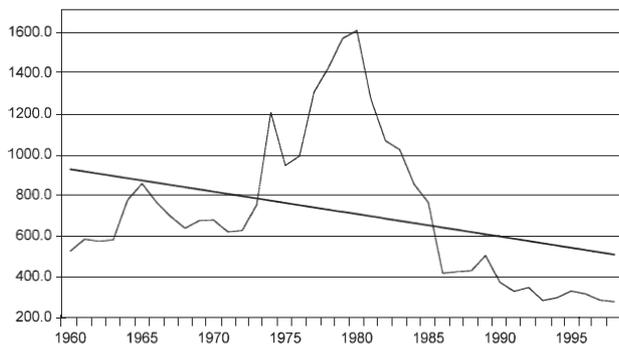


Figure 2—Real terms tin price (1998 c/lb)

Although the capitalist world supports the concept of free markets, the temptation to meddle, often for personal gain is always there. The Sumitomo scandal in 1996 is a case in point. Mr Haminaka of Sumitomo, the world's largest trader in copper, ran into huge losses in the trade of copper futures and options. Sumitomo's influence on the copper market is immense and the first inkling of the problem came to the attention of various security boards, when they detected a 'squeeze' on the market early in 1996—an attempt to force up the spot price by restricting the copper supply. The copper price dropped significantly once news of the scandal was out. This is an example of how the non-physical markets can and do have an effect on prices in the physical market. Although many new copper projects were on the drawing boards in 1996, it was not merely supply and demand imbalances that led to the price decline.

Some 70% of world copper production originates from third world countries. Copper consumption has followed world GDP growth for at least the last 20 years. We would expect this and this is true for most metals, as shown in Figure 3. With the majority of the world's population living in developing countries, this could mean an increased market of 5.4 billion people in the undeveloped and emerging world. Does this imply metal prices increasing as the remaining undeveloped areas become economically active? We believe that these price increases will be contained and even dampened by a simultaneous increase in supply. Often the engine of economic growth in emerging countries is mining. Vast areas of the world are now opening up—Russia, the former USSR, China, Africa, South America, undeveloped parts of Asia. Many of these areas are mineral rich. There may be periods of oversupply initially. We believe that economic development will lead the emerging world into being consumers of the primary products in due course, so adding to world demand. However, development of the mining industry in new parts of the world will add to the supply of natural resources and this is likely to disrupt some of the more fragile markets. Cobalt is an example. The Congo has excellent sources, found together with copper. The imminent rejuvenation of the Zambian copper mines will also put more cobalt onto world markets. An over-supply situation seems unavoidable.

Going back specifically to copper, there are other trends which are negative toward long-term price increases. Let us compare some statistics applying in 1980 and 1995, as set

out in Figure 4. These trends are continuing in the same direction: costs are decreasing and productivity and recovery are improving.

In fact, a commentator on the LME noted that a newspaper cost 3d in 1910; applying inflation and assuming no downward trend, this would imply a newspaper cost of 60p today, whereas the actual cost is 30p. In the same way inflationary pressures would suggest that a ton of copper should cost \$4250 today, rather than the actual price of around \$1700 per ton. The downward trend in the long-term real price of copper is shown in Figure 5.

There are other dark clouds on the copper horizon. As communication through cell phones and satellites increases, and as the fibre optics industry expands, so the need for copper declines.

Substitution is critical in its affect on the price of commodities—aluminium cans rather than tin cans being one example. In the coal market, substitution relates to the ability

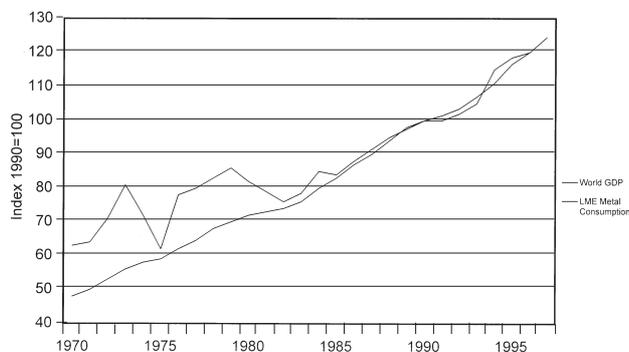


Figure 3—LME Metal Consumption vs World GDP

	1980	1985	1990	1995	2000
<b>Head Grade (% Cu)</b>	>1.0	0.95	0.89	0.94	0.85
<b>Cash Cost (c/lb)</b>	100	63	74	59	53
<b>Total Cost (c/lb)</b>	137	91	102	81	75
<b>Recovery (%)</b>	83	84	84	85	86
<b>Productivity (Ton Cu/manyar)</b>	33	37	45	50	48

Figure 4

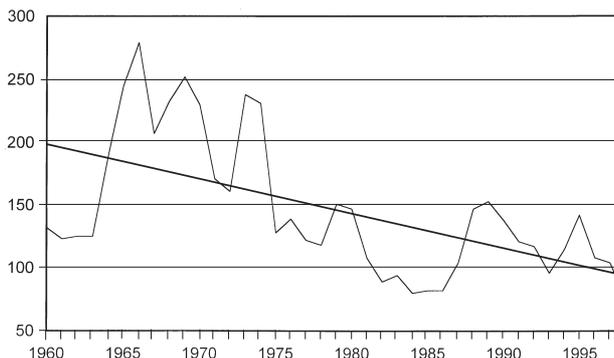


Figure 5—Real terms copper price (1998 c/lb)

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to generate electricity from various alternatives: coal, water, oil, gas and nuclear. Other than hydropower, coal is still the cheapest generating source. The need to transport the coal over long distances enhances the viability of the alternatives for certain power stations. There is enormous pressure to reduce greenhouse emissions and to reduce the cost of electricity. These factors, combined with the relative ease with which coal is mined and the finding of large new resources in many parts of the world, has meant that coal miners are currently faced with extraordinarily low prices, as Figure 6 shows. This Figure also depicts the downward trend in the coal price.

Technology has increased the recovery of metals from used products: the so-called secondary industry. By 1997, 59% of lead produced was from scrap. Usage of lead in the range of products has either been reduced or discontinued; a notable example here is petrol. The long-term lead price graph in Figure 7 again depicts the downward trend in the price.

Zinc is an interesting commodity in that much more of it than copper is mined in the first world. Throughout the century the consumption of zinc has grown from 600 000 tonnes in 1900 to 8 million tonnes in 1998. Substitution with aluminium is a threat always hanging over the market. Price stability (Figure 8) has to a large extent been achieved but here again we see the downward trend, albeit not as marked as for copper, lead and tin.

Finally, let us consider that hugely puzzling metal, gold. Anyone wanting to make a fool of himself need only attempt a gold price forecast. In May of this year Gold Fields Mineral Services announced that the gold price would not exceed \$305 in 1999. It looked as if they were correct until late in September when an announcement was made from some central banks that they would limit (not stop) their gold sales. The gold price soared overnight, rapidly exceeding \$330. The forecasters saw a price of over \$350 before Christmas. Almost as rapidly, the price dropped. While analysts were predicting resistance for the gold price to fall below the \$300 level, the price had already dropped below \$290.

Is gold, as a store of value, a dinosaur struggling to exist in a world of currency trading, plastic money and electronic banking? Figure 9, a graph of the real price of gold over the long term is illuminating because the flat trend suggests that while gold has not increased in value, it has not lost significant value despite our intuitive feelings to the contrary. Certainly gold is a commodity used in the jewellery business but it is never consumed and the central banks holdings have haunted the market for years. That arch gold bear, Andy Smith, of Mitsui, was not dazzled by the recent price increase and feels that the higher prices are not sustainable – the happenings of the last few days appear to justify this view. However, the facts over the long term show that gold has indeed appeared to have held its value.

You may have noticed one important trend in all these price graphs, with the possible exception of gold. In real terms the price trend has been downward over the last 40 years. This gives the lie to the 1972 opinion of the Club of Rome that prices will be driven upwards by increasing scarcity. In fact, however, it is not just that there has been an increase in supply of the commodities of such a degree as to

match and exceed the increased demand. Let us look at a number of other trends that have affected commodity prices and whose influence, we believe will continue to do so into the new millennium.

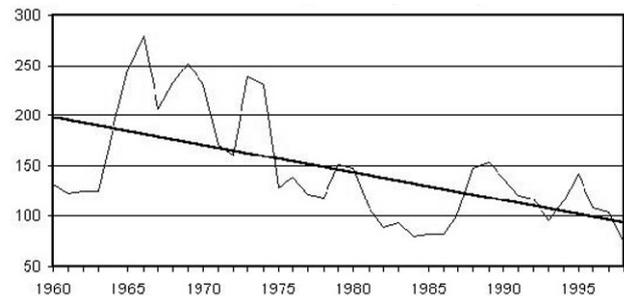


Figure 6—Real terms coal price (1998 US\$/t)

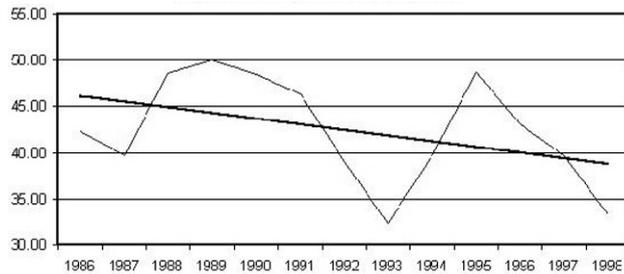


Figure 7—Real terms lead price (1998 c/lb)

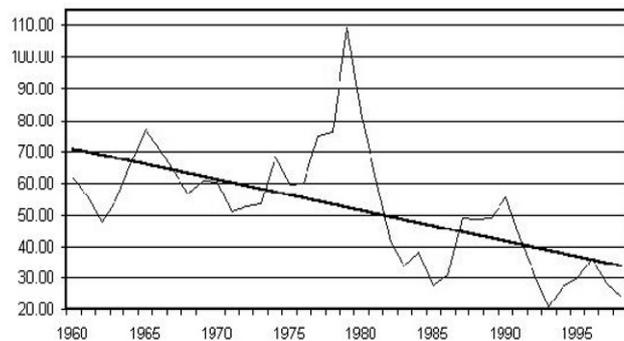


Figure 8—Real terms Zinc Price (1998 c/lb)

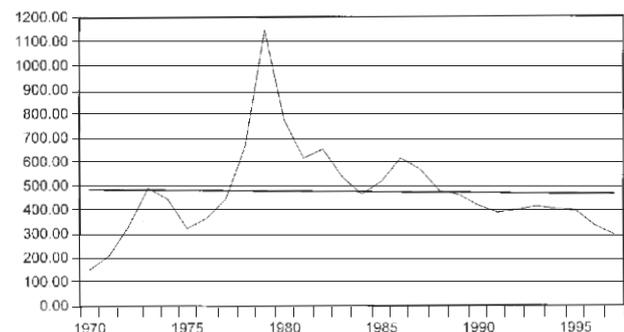


Figure 9—Real terms gold price (1998 US\$/oz)

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### Trends and their impact on commodity prices

We live in a deflationary world. Although developing and emerging countries may still be grappling with mega-inflation rates, one sign of economic success is to control and lower inflation levels. Major commodity buyers are in the low-inflation countries and their aim is, in terms of their own hard currencies, to limit price increases in raw materials. The 'soft' currencies may weaken and compensate emerging countries for their internal high inflation. As a country gets into good economic shape its inflation rate will drop and its currency should stabilize—hence prices received will tend to be static or even to decrease.

Combined with this trend are the technological improvements and innovations which allow the mining and extraction of metals and minerals at ever decreasing unit costs. Examples of this are the SX-EW process which saved the American copper mining industry and heap leaching that has allowed the mining of low-grade gold deposits. In fact, much of the world's increased supply of commodities has emanated from a new ability to profitably mine deposits previously thought too low-grade to bring to account. To add to the woes of miners, technological improvements have resulted in lower unit usage of primary products in a vast range of industries. Consider the lighter weight of the average motor car today, compared with a 10-year-old model.

Improved transport infrastructure worldwide is allowing the exploitation of mineral deposits in remote areas. Again, this is a process that will take time to bring in as new infrastructure is developed. We are already hearing of African countries, hungry for dollars, flying concentrates out in transport planes acquired from the Russian military. Climatically inhospitable areas are starting to yield up their mineral wealth, Red Dog in Alaska being an example. Being frozen in for half the year has not stopped the mine being developed. Permanent resident work forces are not considered essential in many parts of the world and flying workers in for short, concentrated bursts of activity often results in staggering productivity gains.

Increasing environmental concerns have been apparent over the last years of this century. Initially they were centred around the worries of the much-criticised tree-huggers. Serious business got down to production and so what if a few rain forests vanished. The climatic changes, global warming and rising sea levels are showing the folly and sheer irresponsibility of such thinking. Low-lying areas in places like the Seychelles, Fiji and Samoa are already being covered by rising seas. Already environmental issues can slow or stop mining development in first world countries. The poverty in developing countries desperate for dollars often means that lip service is paid to environmental issues. The priority of feeding increasing numbers of people comes first. We have seen this with the Kyoto Protocol which dealt with the subject of increasing greenhouse emissions; and where developing countries are being dealt with differently. The future will and must show increased attention to environmental concerns for the health of our planet. However, because of competition from developing countries, we do not believe environmental spending will push commodity prices upwards.

And now we come to the subject of derivatives. The efforts of producers to limit their risk are not new. An example is the standard 3-month price quoted on LME contracts—in the days of sailing ships this was the average sailing time from the East to Europe. Because of all the change in the second half of this century, price volatility has increased and so has the use of derivatives as shown in Figure 10. The total derivative market today is worth in excess of US\$100 trillion! Derivatives have value only in a world of volatility. They come in two flavours: futures, which are contracts for future delivery of a commodity at a specified price, and options that give one the opportunity to buy from or sell to someone at a pre-arranged price

By hedging, a producer ensures that the price received stays within a certain range. By way of a simple example: a copper producer acquires options to sell at \$1700. If the price slips to \$1500 he still gets his \$1700 but if the price soars to \$2000 he does not benefit from this upside. Used properly, hedging brings greater certainty to one's business. Often however, a greed or fear factor kicks in where companies are happy to get a premium on existing prices but cannot stomach getting the hedge price when the market price has surged upward. It is then that we find positions being unwound and borrowings of the commodity taking place, particularly if more of the commodity has been hedged than is being produced. A columnist from the Financial Times once remarked: 'A derivative is like a razor. You can use it to shave yourself or you can use it to commit suicide'.

Although it is clear that derivatives limit price volatility for producers, it is not so clear what their overall effect is on world market prices and how the paper trade influences the physical commodity trade. Where there are occurrences that would normally cause price changes (such as wars, or announcements from banks about limiting sales) then the existence of huge numbers of derivatives associated with the commodity could cause even more violent fluctuations as producers, dealers, traders, speculators and end users all seek to better their positions. Although the jury may still be out on the overall effect of derivatives on the physical market, it is our contention that in the long term they depress prices.

Mining has always been viewed as an expensive, high-risk business and as such has been conducted, through much of this century, by large organizations. These companies have been able to weather the storms of price fluctuations and have had access to the latest technology. They have not,

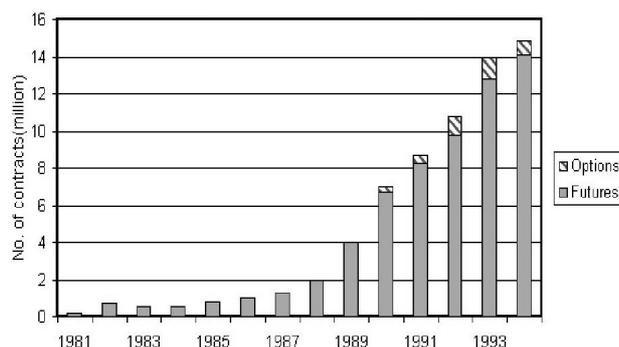


Figure 10—Growth in paper trade

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however, been renowned for their ability to limit their costs. Their overheads have generally been high. We are now seeing more small producers and a lot more of outsourcing. Large mining groups are announcing their intention to cut back on traditional roles such as exploration, in favour of buying the rights to mines and prospects from companies who specialise in exploration. Mines are started with minimal capital expenditure, where virtually all the functions are outsourced to specialist contractors. Generally this leads to a reduction in costs.

All of these factors are combining to move prices in one direction—and that is downward. That is not to say we will not see price cycles, coincident with economic growth. Of course we will; but overriding these cycles will be a consistent downward pressure on the long-term real price.

### The opposite side of the coin

Together with all the global trends we have discussed already, there is a complementary and opposite movement of individualization—possibly a subconscious attempt to maintain identity.

Applicable to commodities is the concept of customization of products for particular users. This is seen noticeably, for example, in coal mining where very detailed specifications arise for certain customers. In practice their furnaces could take a wider range of coal qualities but they are often prepared to pay a premium for a very specific quality. This is not 'bad economics' because the approach is continued through to the end product and used in the marketing.

Customization is often combined with vertical integration where raw materials are produced, beneficiated and manufactured into consumer products. In South Africa there has long been a call to use our gold rather than just sell it on world markets. The arguments against this are: we cannot make high-fashion jewellery because we do not have the designer skills found in Italy or Paris; we cannot make the simple chains produced in the East—which really are made for those people who want to hold gold as a store of value and use the lady in their lives as the means of storing it—because we do not have the cheap and productive labour. These arguments are valid but what we can do is make a typically African style of jewellery. The market emerges out of increased tourism. In fact, tourism, the world's largest industry, can be a great promoter of local industry.

What all this means is that while producers may be faced with declining long-term prices, they have the potential to add to their bottom line by local sales and the production of value-added products.

### Looking ahead

Let us now look forward to the future. There is a definition of the future which goes like this: 'the future is that period of time in which our affairs prosper, our friends are true and our happiness is assured'. Being aware of the hazards of forecasting and using all the trends discussed here we foresee a long term downward trend in prices. There will still be price cycles with spikes and troughs, but this downward trend will override these in the long term. In fact, the first few years of the millennium are likely to be ones of improved prices. This view is based on the fact that commodity prices

are presently at extremely low levels and we are seeing world-wide economic improvements; we especially expect to see improvements in the Asian economies. However, such price increases will still be within the context of a declining-long term trend, as shown in the price graphs. The long-term is important: it would be false to believe that prices will just decline from present levels. It is emphasized that this is a trend and it is a continuation of what has been in place over the last 40 years.. What does this mean to the producer of primary products or for those involved in beneficiation? It means that in starting a mine or a new plant, a host of global and local factors need to be considered over and above the usual technical issues. It is not sufficient to only consider the economics of the commodity. A specific market evaluation for each operation is needed. Further, this should be regularly reviewed and adapted to changing circumstances. Change is still with us and the pace of change will accelerate as we move into the new millennium.

The other question that occurs: is continued technological change possible? Lack of financing for pure research may be a problem and we already see the slowing of funds into academic institutions. Applied research where the path from the laboratory to the market place is clear will continue. We can expect to see new mining and beneficiation methods as well as new manufacturing processes being increasingly efficient in the usage of raw materials. All this will continue the lower price trend.

Perhaps the words of Victor Hugo will come true in the future and there will be peace, no wars, no frontier disputes, no religious and racial discrimination—perhaps.

What we believe is more definite is that miners and mineral processors, often in developing areas, are going to have to work within the constraints of lower prices. They are going to have to become leaner and meaner in their approach. They are going to have to be more innovative in the methods of work; there will be huge new markets opening but at the same time the sources of supply will increase enormously. Technological changes and progress will continue and professionals in all fields will battle to keep abreast of new findings. Greater specialization will result. The novel, creative and cost-effective idea for getting a job done will be much sought after.

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