

World mineral statistics

A unique quantitative record of mineral use

by Greg Chapman, *Keyworth*

Minerals are the material basis of most of the built environment and the world of technology and communication. This is easy to forget as we see inflated, and sometimes imaginary, values ascribed to corporations dealing in intangible products and services. The sober fact is that a mobile phone or a computer cannot be made out of anything but the mineral products of the Earth. As we reach for sustainability it is equally easy to overlook the fact that, so long as we opt

for economic growth, recycling can supply only a part of the materials we use in everyday life.

Concerns about security of minerals supply are now much less than in the tense 1970s and 1980s but no industrialised country is now self-sufficient in mineral raw materials, and the UK is more dependent than most on the output from mines and processing plants scattered throughout the world. As well as materials needed by our own manufacturing industry, which is still a significant part of the national economy, we also import mineral products in the form of consumer durables made elsewhere. Our

partners in the European Union, present and prospective, are, to varying degrees, in similar positions. Against this background, the reasons for needing to track the origins and movements of minerals around the world become evident.

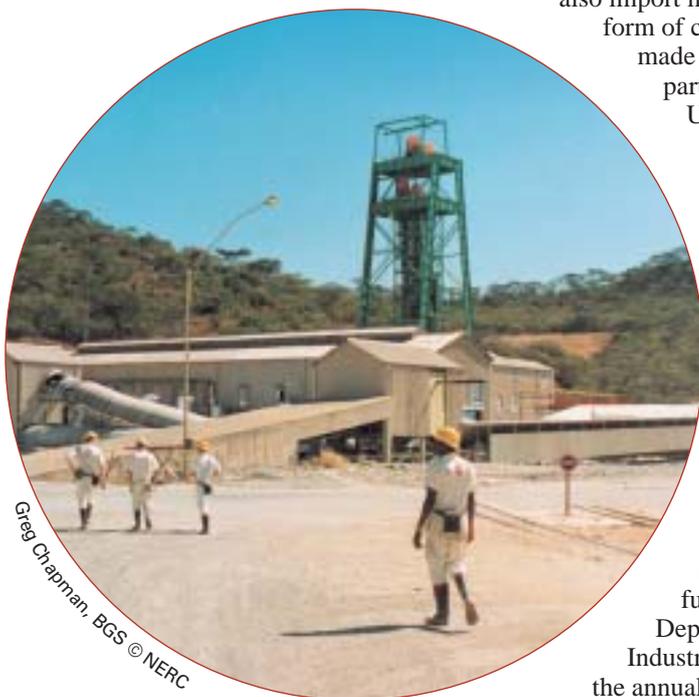
The BGS World Mineral Statistics database, which is funded chiefly by the Department of Trade and Industry, contains statistics of the annual production, import and export of 65 mineral commodities and approximately 170 sub-commodities. Data are gathered and

analysed from more than 150 countries and the World Mineral Statistics team updates and reviews 55 000 database items each year. Production data are obtained from official bodies, companies, trade associations and personal contacts, quality-controlled by participation in international workshops. Data can be downloaded as commodity tables organised by country or as country tables by commodity — the former is the pattern followed by the annual book *World Mineral Statistics*. No other database that covers almost all minerals contains both production and trade data, which allows the consequent additional option of calculating annual consumption. The only omission at present is that of aggregate minerals (crushed rock, sand and gravel). This is due to the lack of internationally comparative data, but the team has recently started to amend this omission, at least so far as Europe is concerned.

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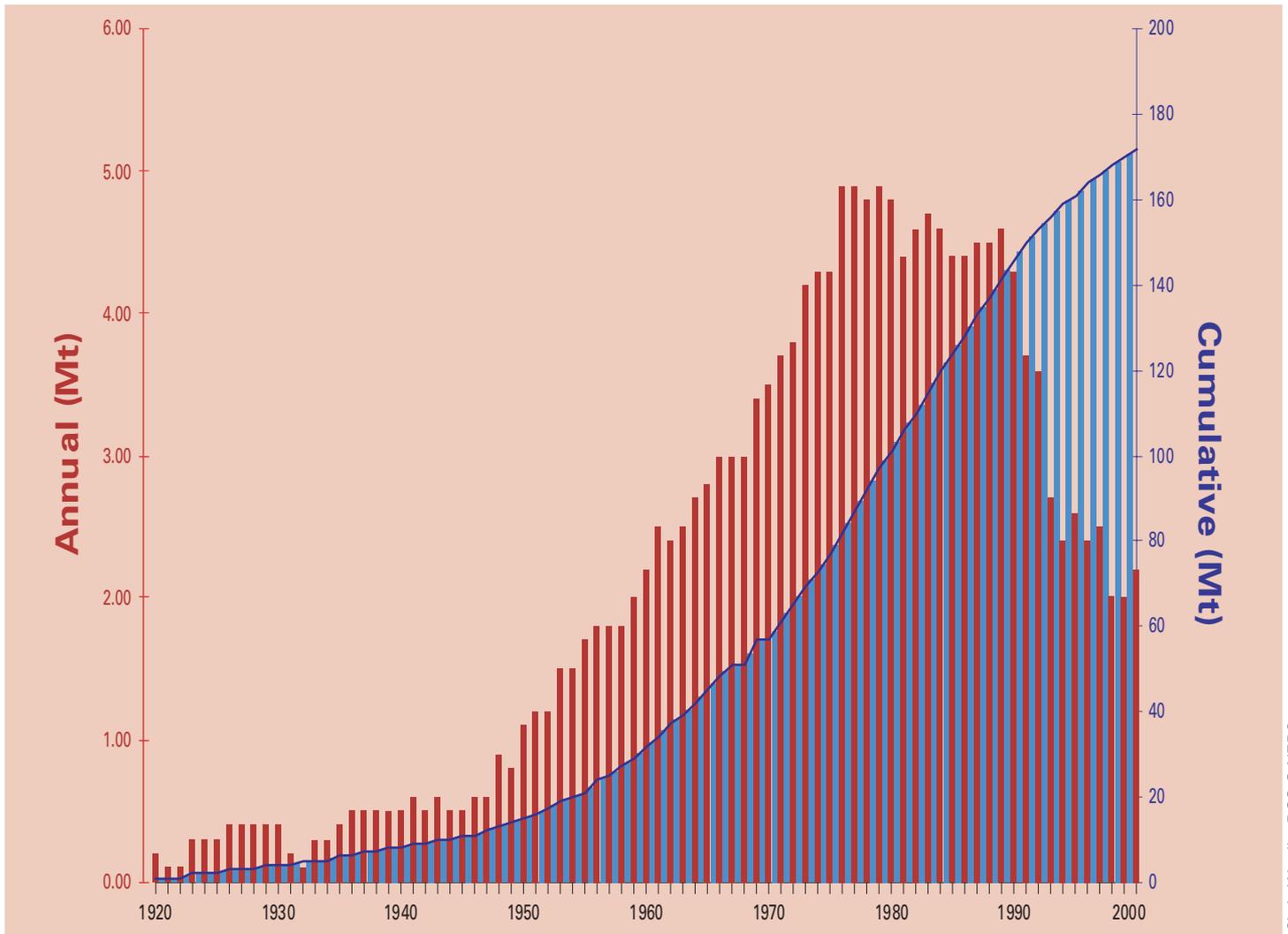
Compilation of world mineral statistics by the BGS and its predecessors has been continuous since 1913, and as a result we have a unique quantitative record of mineral use for the best part of a century. A vital feature of these data is that, unlike statistics for, say, food production, mineral statistics are largely cumulative: a high proportion of the materials produced are still in use, even if transformed by recycling. The value of this has been brought out by the many enquiries received about asbestos statistics.

Analysing our record of asbestos production and trade is probably the only way to assess how much asbestos has been used, and therefore how much may still be incorporated in buildings and industrial plant. The method can be equally useful for metals. Authorities now measure carefully what proportion of annual consumption is made up of recycled metal and what proportion of annual scrap metal is recycled (it is not the same thing) but these numbers are small compared to the amounts of metal actually in use.



Greg Chapman, BGS © NERC

Asbestos mine in Zimbabwe, visited by the author in 1994.



Chris Wardle, BGS © NERC

World asbestos production

The chart illustrates the rapid rise of world asbestos production from about 1950 to 1975; after 1979 a decline started, influenced by environmental doubts. From 1990 onwards the fall in production became steeper as the USA and most European countries phased out the

use of asbestos. Production now appears to be levelling off as Russia, Brazil, Mexico and several industrialised countries in Asia continue to use asbestos in manufacturing. Russia, China, Canada, Brazil and Zimbabwe are the main world mine producers. Total mine production in 2000 was 2.2 million tonnes but the cumulative curve shows that

production since 1913 has amounted to 170 million tonnes. It seems probable that the bulk of this tonnage is either still performing its original function in buildings and manufactures, or has escaped into the environment. Asbestos in redundant buildings and other places is now recovered under strictly controlled conditions and disposed of safely.

The statistics are also used for explanations, forecasts and illustrations of geopolitical issues, supply patterns and trends. In the context of sustainability and the 'north-south divide', the statistics show how the extraction, and especially the processing, of all but the lowest-cost minerals continues to be transferred from the industrialised countries to the developing world. This is advantageous to the developing countries in that value is added to the eventual exports, but there may be an environmental cost involved. The figures

also show that the production of many minerals is highly concentrated in a small number of individual countries — although this is nothing new. In 1920 more than half of world copper output was from the USA; now the dominant producer is Chile with more than a third of the total.

Appreciation of the geological setting and subtle mineralogical and geochemical complexities of minerals output, as well as an appreciation of economic and political issues, make the argument that

a geological survey organisation should be responsible for monitoring and analysing the output of the world mining industry. The BGS has a high reputation for its statistical products and will continue to develop them to meet the changing needs and concerns of its customers in Britain and throughout the world.

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