

POLINARES is a project designed to help identify the main global challenges relating to competition for access to resources, and to propose new approaches to collaborative solutions

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Minerals: industry history and fault lines of conflict

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3. Minerals: industry history and fault lines of conflict

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1. Introduction

As in all areas of policy analysis, an understanding of history can help to inform judgements to be made about where major policy challenges are likely to arise and how to address them.

The object of this chapter is to examine the history of the minerals industry and to seek to draw out from this history some observations on the sources of past conflicts and on the transmission mechanisms for these conflicts. Through this analysis, and also by looking at periods marked by a greater spirit of co-operation, it is hoped to contribute to the project task of defining policy measures which might foster more collaborative behaviour in the minerals sector, thereby to improve the availability and security of mineral supply. For the purposes of this chapter, minerals are taken to be what are commonly known in the business as ‘hard minerals’, to distinguish them from oil and gas. They include all minerals recovered by mining, including metals and non-metallic minerals, and also the mined energy minerals, coal and uranium.

The approach adopted is essentially chronological, being based around some of the broad historical periods, or moments within these periods, outlined in the introductory chapter. The present chapter starts with an examination of mining up to, and including, World War II, before progressing through the period of decolonisation and the Cold War to the economic liberalisation of the 1980s and 1990s. It ends with a review of events since 2000 and with some reflections of where the industry appears to be headed. For each period, the attempt is made to identify the key ‘fault lines’ of conflict and, where appropriate, to link these in with some of the broader global themes outlined in the analysis being undertaken by Polinares.

2. Early industrialisation and imperial liberalism

2.1 Early industrialisation and local mineral supply

The demand for minerals derives from industrial development and countries having local resources of minerals were naturally advantaged in the early stages of industrialisation.¹ Great Britain, the crucible of the industrial revolution, had local resources of iron ore, limestone and coal with which to build a basic iron and steel industry. During the first half of the nineteenth century, Great Britain was the world’s largest producer of copper and lead, accounting for 40% of global output of these metals, as well as 30% of the world’s tin.

¹ Clearly, there were also pre-industrial uses of minerals. The Romans’ interest in Briton was partly motivated by the pursuit of tin and copper, while the Spanish conquest of South America was driven by the quest for gold and silver. However, these pre-industrial experiences lie beyond the scope of this chapter.

During the same period, Germany accounted for around two-thirds of world zinc production. (Julihn 1928, Pehrson 1929, Smith 1929, Umhau 1932).

By the second half of the nineteenth century, local resources were proving too low grade or too small scale to support the spread of industrialisation in Europe and the accompanying growth in demand for mineral raw materials. Gradually, the minerals industry started to go international, with mines opening up in southern Africa, in East Asia and in Latin America to serve the requirements of the growing industrial centres. In the 1850s, Great Britain was overtaken by Chile as the world's largest producer of copper and in the 1860s by the US. By 1880, Great Britain's share of world copper production had shrunk to under 2%. Symptomatic of this shift in the location of mineral production, the London Metal Exchange was set up in 1877 for trading metals internationally, its standard three month contract reflecting the shipping time to London for Chilean copper and Straits tin.

2.2 Mining goes global

Investment from the industrialising countries played an important part in the development of the new, richer resources, but it was not all a colonial affair. The Chilean copper mines were for the most part owned and run locally, although shipping was largely controlled by Europeans. Tin mining on the Malay Peninsula was almost entirely in the hands of local Chinese, and remained so after the Malay States became a British protectorate in 1895. Rio Tinto's acquisition of a copper mine in southern Spain (from which the company took its name) in the 1870s could hardly be described as a colonial act. By contrast, tin mining in the Dutch East Indies (now Indonesia) was largely run by the colonial government while the mining of nickel in the French colony of New Caledonia, which commenced in the 1870s, was largely undertaken by French convict labour.

Colonialism and foreign investment played a much more prominent role in the opening up of Africa's resources. Capital raised in London and New York was important to the development of the diamond mines around Kimberley in the 1860s and 1870s and in the gold rush in the Transvaal that followed it in the 1880s. The push north from the Transvaal by Cecil Rhodes during these years into what was later to become Northern and Southern Rhodesia (now Zambia and Zimbabwe respectively), was driven by the belief that the area harboured substantial mineral resources, including diamonds and copper. Sharing a similar conviction, and intent on blocking the British push northwards, King Leopold II of Belgium gained control over the almost three million square kilometres of the Congo in 1883, an entitlement which was formally recognised by other European nations in the Act of Berlin in 1885. Things did not stop there, however, and in the next fifteen years, in what became known as the Scramble for Africa, the entire continent of Africa, with the sole exception of Ethiopia, fell into the hands of one or other European power. (Lynch 2002)

The colonisation of Africa brought with it major mine development. Copper production started in Northern Rhodesia in 1906 although it was not until the late 1920s that the full extent of the Africa Copperbelt was appreciated and production really began to take off. The

two principal companies involved were the Rhodesian Anglo American Corporation and Roan Selection Trust. To the north, the Belgian company Union Minière du Haut-Katanga (UMHK) was embarked on the development of the copper deposits of the Katanga province of Congo, with first production taking place in 1911. In 1917, Anglo American was formed by Sir Ernest Oppenheimer and the US financier J P Morgan for the development of mines in southern Africa, the company taking its name from the regions where the company raised its initial capital.

In contrast to the situation in Europe, the US, with its large land mass and rich domestic resources, had less need to look overseas for mineral raw materials to support its industrialisation. The pursuit of natural resources - and particularly gold - was, however, a key factor driving the settlement of the American West and was employed as justification for the appropriation of the lands of the Native American peoples as the new nation was pulled together and industrialised during the course of the nineteenth century.

Americans were, nevertheless, energetic businessmen and interested in financing mining projects wherever in the world there was money to be made, as could be seen from their involvement in South African mining. The mineral resources of Latin America had also caught their eye. Following the discovery at Bingham Canyon in the state of Utah that copper could be profitably recovered from low grade ores if mining was on a sufficiently large scale, US investors, led by Daniel Guggenheim, acquired the El Teniente and Chuquicamata mines in Chile, in 1915 incorporating these interests into the Chile Copper Company. These mines were a few years later sold on to two of America's largest mining companies, Kennecott and Anaconda, respectively. (Lynch 2002)

The growth of mining in Australia was, as with the USA, driven significantly by local enterprise, this despite Australia remaining a British colony (or, more strictly, a collection of colonies) through to the beginning of the twentieth century. The industry was effectively launched with a gold rush in the colony of Victoria in the 1850s. However, while gold tended to be relatively small scale and local, it was the production of base metals that provided the launch pad for what were to become some of Australia's largest mining companies. The silver-lead-zinc deposits of Broken Hill in New South Wales spawned, in the mid 1880s, Broken Hill Proprietary (BHP) and North Broken Hill, and, in 1905, Consolidated Zinc. Further north, in Queensland, the silver-lead-zinc deposits of Mount Isa provided the foundation for the growth of Mount Isa Mines.

While it is evident that major strides were taken in these years in the development of the world's mineral resources and in the establishment and organisation of global markets in minerals, this can hardly be characterised as an era of collaboration. There were, no doubt, producers content to supply the metropolitan powers voluntarily in return for the opportunity to make profits but there were many cases where resources were simply commandeered without reference to traditional landowners, where mine developments took place in enclaves managed by outsiders in which labour had few rights, and where little benefit passed into the local economy. The colonial powers largely dictated the terms on which resources were

developed and traded, backing this up with latent or actual force, so as to ensure that the needed commodities were able to flow back to the home nations and that the assets of investors were protected. Interference in this process from local political groupings (as with the Boers' resistance to the activities of the British in South Africa at the end of the nineteenth century) or from indigenous people (as with the aborigines in Australia or the tribal peoples of Africa) were not tolerated. The major competition was between the great European powers and mining countries outside these regions were for the most part simply adjuncts of the big power game. This game came to a head with the First World War before breaking itself altogether with the Second World War.

3. Decolonisation and the Cold War

3.1 Decolonisation and nationalisation

The Second World War marked the effective end of the colonial era and in the years that followed most of the remaining European colonies were granted political independence. The focus of the global mining industry meanwhile was gradually shifting towards the emerging superpowers of the US and the Soviet Union, and towards developing countries. However, the economic relationships which had characterised the colonial era were not to be so quickly eradicated and many of the fault lines of conflict which developed during the colonial era persisted and indeed widened.

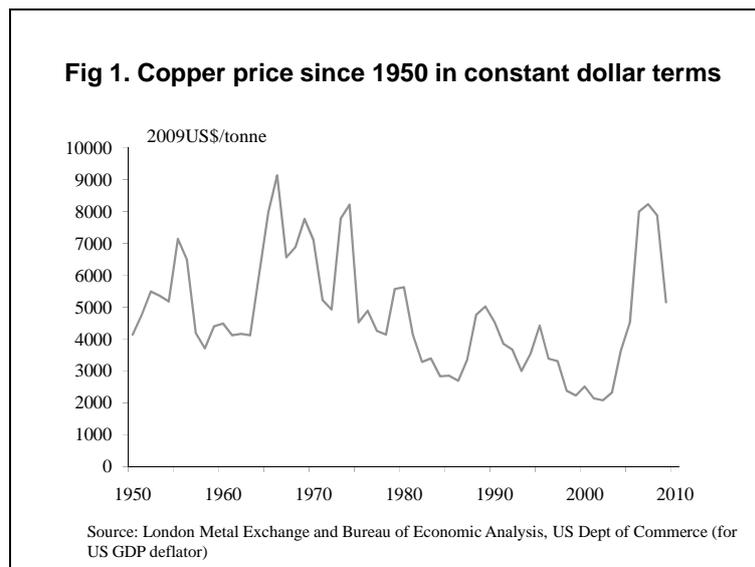
The early post-war years were a period of US geopolitical hegemony. The accompanying pressures for freer trade and cross-border investment meant that through the 1950s and 1960s big international companies - TNCs, or transnational companies, as they came to be known - from the US and Europe continued to play an important part in shaping international economic relationships, including those bearing on the minerals sector.

From the perspective of many newly-independent countries, it seemed that these companies were simply perpetuating colonial economic relationships by other means. They served to keep key economic sectors in the hands of foreigners, they ensured that the rent from these sectors (as well often as the product) went back to the companies' home countries, and they generally perpetuated colonial-style relationships of economic dependency. Mining TNCs were commonly viewed as having little interest in the development of the economies in which they were operating (for example, by processing their products locally) and many were suspected of operating schemes such as transfer pricing to avoid taxation in the host country. These relationships were, many countries determined, if not technically colonial, then decidedly 'neo-colonial'. This insight was reinforced by the fact that many of the mining companies focused their activities on areas of previous colonial influence. Thus, French mining companies were deeply involved in West Africa (e.g. Niger, Gabon, Ivory Coast, Mauritania, Guinea), while British companies were prominent in mining investment in Australia, Canada and southern Africa. US mining companies, for their part, were making a big play in South and Central America.

With demand for minerals growing strongly as Europe reconstructed and Japan re-industrialised, the notion gradually began to take hold in many of the former colonies that, to break the cycle of impoverishment and dependency, political emancipation was not enough. To control their economic destinies and to capture the full value of their resources for their people, they needed outright ownership of their resource industries. Nationalised mining sectors, it was reasoned, could be used to deliver economic and social benefits more directly to a country's citizens as well as serving as instruments of broader economic development. Not surprisingly, the notion had strong popular appeal. Nationalisation not only promised the retention of wealth generated from minerals within the country but it constituted a clear and public rebuff to erstwhile colonisers and provided a cause around which politicians could rally their populations and assert their nationhood. In short, the fault line of this particular phase of conflict was emphatically and unmistakably national. It was about the assertion of the sovereign right of an independent nation to organise and control its economic and political affairs. And it was about the use of national mineral resources for national economic development rather than for private, and foreign, profit.

The notion of nationalisation as a means to attain greater public benefit from mining was not new, nor was it just a matter for developing nations. The Russian government had nationalised the country's mines, along with the rest of its industry, following the revolution of 1917. The Finnish government nationalised copper miner Outokumpu Oyj in 1924. In the UK, the coal industry had been nationalised in 1947 while the Swedish iron ore producer, LKAB, was taken fully into state ownership in 1957. The Indonesian government had acquired the country's principal tin mining companies on attaining independence from the Netherlands in 1950. Bolivia had nationalised its tin mining industry in 1952. However, the post-colonial period saw a strong resurgence of interest in the idea.

Following the country's independence in 1960, the government of the Congo took the Belgian company UMHK into national ownership in 1967, placing its assets in a new state copper company, Gécamines. During the decade that followed there were widespread nationalisations across the mining sector, the timing of this activity almost certainly owing something to the buoyancy of commodity prices in the late 1960s and early 1970s and the resulting belief that there were significant rents to be had from the sector. (See copper prices in *Figure 1* below.) In 1969, the governments of Zambia and Chile both took majority stakes in their copper mining industries, with Chile fully nationalising the sector in 1971. Also in 1971, Guyana nationalised its bauxite mining industry and Mexico its copper industry. Peru took the country's principal copper producer, Cerro de Pasco, into state ownership in 1974 while Jamaica partially nationalised its bauxite mines in 1975. Foreign-owned iron ore producers were nationalised in Venezuela, Mauritania, Peru and Chile during the first half of the same decade. (Crowson 2003) This did enormous damage to the confidence and business interests of the mining TNCs, and some, such as the large US miner, Anaconda, which saw its assets in both Chile and Mexico nationalised, never recovered.



3.2 Influence of the Cold War

Overlaying these developments was the Cold War and the associated polarisation of the world into two ideological camps, the one led by the US, the other by the Soviet Union. For countries seeking to distance themselves from their former colonial masters, the Soviet Union's (and to a lesser extent China's) commitment to state ownership and a planned economy chimed well with governments suspicious of capitalism and eager to take control of their resource sectors. The Soviet Union, through its control over domestic resources and those of its satellite states, was largely self-sufficient in minerals, but was happy to capitalise on the disenchantment felt by these countries towards their former masters. To stem the spread of communism in these countries, and to prevent their resources coming under Soviet control, the US and its western allies found themselves supporting some autocratic and corrupt regimes. Thus, President Seso Seko Mobutu of the Congo was able to attract the support of western states by presenting himself as the only the leader strong enough to hold the Congo together and to keep its valuable mineral resources out of Soviet hands.

South Africa represented a particular focus of concern for the forces of western capitalism with respect to its mineral resources. By a quirk of nature, the Soviet Union and South Africa between them dominated world supply for a number of critical mineral commodities, including chromium, manganese, vanadium and platinum. These were deemed industrially and militarily strategic by western governments. At the same time, South Africa's apartheid regime was not only hugely unpopular internationally but mounting internal opposition and unrest threatened to lead to political instability in the country and in the region. The Soviet Union sided with the anti-apartheid movement and assisted by, for example, providing training for ANC (African National Congress) leaders.

Adding to the region's political risks, two former Portuguese colonies to either side of South Africa had moved into the Soviet sphere. Following a coup in 1974, Mozambique became formally independent of Portugal in 1975. The incoming FRELIMO government established a one-party Socialist state and aligned itself with the Soviet Union and Cuba, from both of which it received substantial aid. To the west of the continent, something similar was occurring in Angola. Having also gained its independence from Portugal in 1975, leftist MPLA forces, supported by troops from Cuba, took control of the country. Despite facing almost continual civil war with western-backed forces (notably those of UNITA), the MPLA retained control of the country through to 1991 when it was formally elected to government in UN-monitored elections.

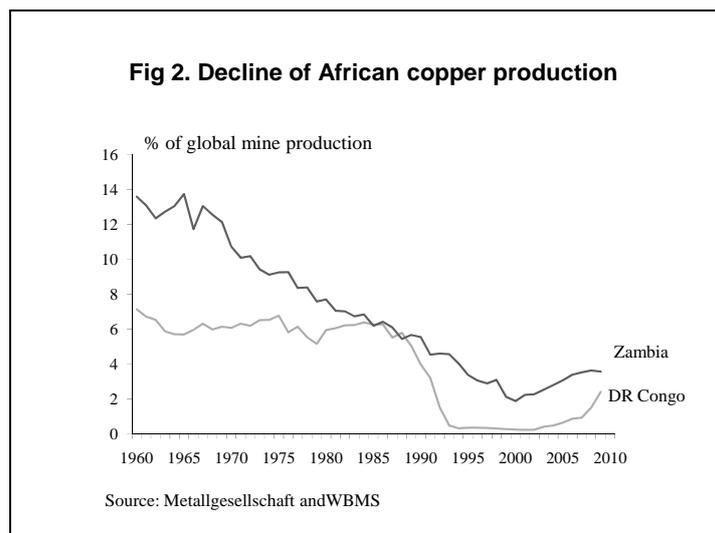
The combination of these political developments in southern Africa and a strong run-up in mineral prices over 1978-1980 prompted serious concern amongst western governments about the possible disruption to their mineral supplies. At the extreme, there were allegations from the US political right that the Soviet Union was engaged in a 'resource war' on the west. Although the evidence for this was never very strong and although the economic slump of 1981-82 substantially alleviated concerns over supply availability, the US, the EU and several EU member states conducted investigations into these matters and some instigated programmes for strategic stockpiling of the commodities deemed most at risk. (Miller *et al* 1980, Council on Economics and National Security 1981, Maull 1986, House of Lords 1982) The USA's determination to have the right to mine minerals from the seabed in international waters, should its strategic interests so require, was a key factor leading to its refusal to sign the UN Law of the Sea Convention in 1981.

3.3 The North-South divide

The 'politicisation' of minerals which occurred during the Cold War, both amongst producing and consuming countries, was not however, very obviously delivering positive benefits for mining nations. The notion that a change of ownership was all that was required to ensure the sector would serve social objectives and promote economic development was always unduly optimistic. Disillusion was setting in and deeper concerns about the impact of mining on the political economy of developing countries were beginning to emerge.

Too often, and particularly in Africa, the resource industries which had been nationalised were not being used to benefit the people but were serving to enrich a governing elite with strong links to foreign interests. "African leaders", observed President Kwame Nkrumah of Ghana, "became the policemen of the western interests" and were rewarded accordingly. (Ochola 1975) Meanwhile, with sources of commercial finance cut off, the capital base of

the mining industries in these countries shrivelled up and production went into severe decline. *Figure 2* below shows the decline in the copper production of Zambia and what is now the DR Congo. The view was taking hold that a country's possession of minerals, far from assisting its development, might actually inhibit it by distorting the economy and its exchange rate, by exacerbating inequalities, and by fostering corruption and repression. (A notion that later became encapsulated in the notion of the 'resource curse'.) In some cases, where the resources were located in regions with an ethnic identity which was different from that of the ruling group, such centralised state control could give rise to pressures for political secession, as occurred, for example, in the Katanga region of the Congo (then called by its Swahili name, the Shaba province) where there was an armed uprising in 1977-78, and on Bougainville Island in Papua New Guinea during the 1970s and 1980s, where a revolt by local Melanesian groups resulted in the closure of the Bougainville copper mine in 1989.



The other realisation that was emerging was that a simple change of ownership did not result in any increase in producer pricing power. Not only were governments with nationalised mining industries having to grapple with the effects of volatile commodity prices on their fiscal flows but, worse, there was growing evidence of a systematic bias in the international trading system against commodity producers. Prices of commodities relative to those of manufactures – what is known by economists as their 'terms of trade' – appeared to be showing a persistent long run decline. Something of this can be seen in the downward trend in real copper prices following the copper price boom of the late 1960s and early 1970s in *Figure 1* above.

UNCTAD played a prominent role in promulgating this case on behalf of developing countries and in fashioning schemes for commodity price stabilisation and for promoting downstream integration to help countries break out of the trap into which their commodity dependence appeared to have placed them. Perhaps not surprisingly, there was also much talk at the time amongst developing countries of seeking to follow OPEC's example in oil and form producer cartels as a means to force up mineral prices. While associations of producers and exporters were set up during late 1960s and early 1970s for all kinds of commodities including copper, iron ore, bauxite, phosphates, mercury, tungsten and silver, these never had the internal disciplines or the market coverage to give them real political leverage or to have a material impact on market prices. (Crowson 2003)

At the end of the 1970s, these concerns about the conditions of commodity-producing developing countries had become widespread and global. An international commission chaired by former German Chancellor Willy Brandt issued an influential, and deeply pessimistic, report in which it argued that the growing wealth of the industrialised 'north' was based on the continuing impoverishment of the developing 'south' and that the two halves of the globe were on a collision course. (Brandt 1980) Central to this claim was the spectre of ever-cheapening commodities. These not only condemned developing countries to remain forever 'hewers of wood and drawers of water' but would eventually lead, through starvation, environmental catastrophe and terrorism, to the general destabilisation of the south and a consequent threat to the security of the north.

Picking up a theme and a label that were already current amongst developing and non-aligned countries, the report argued that what was required was a 'new international order' (NIEO) - a new global political perspective which acknowledged the mutual interests and dependence of the north and the south and a new set of international institutions to go with it. Within the commodities sphere, it proposed a series of measures to increase the availability of finance and technical assistance to developing countries, encourage downstream integration in mining countries, and push forward with the commodity price stabilisation and support schemes that UNCTAD had been championing.

4. 1980s and 1990s: triumph of economic liberalism

4.1 Return of the market

In retrospect, it can be seen that the Brandt report represented the high water mark of attempts to engineer government-driven solutions to the world's development challenges. Although the prices of many commodities remained severely depressed through much of the 1980s, the open conflict between the north and south that Brandt warned about did not materialise. Indeed, developing countries began to emerge during this period as a growing force in the world economy and a growing force in global mining. A new spirit was abroad, the spirit of the market and of economic liberalism, bringing with it a new set of recipes for economic growth and development. This change in the spirit of the times was most prominently illustrated in the West by the election, on stridently free market platforms, of

Prime Minister Margaret Thatcher in the UK and President Ronald Reagan in the US, in 1979 and 1980 respectively.

However, this was far from being a western affair. In the late 1970s, following the death of Mao Zedong, a new leadership of the Chinese Communist Party was emerging under Deng Xiaoping. This new leadership was pragmatic and modernising, repudiating the Cultural Revolution and exhorting the Chinese people to enrich themselves. The communist regime in the Soviet Union was continuing to hang on, but it was rapidly losing its global influence as its economic power waned. By the end of the 1980s, with the liberation of Eastern European states from Soviet control, it had effectively lost the fight.

This new wave of economic liberalism had powerful resonance within the mining sector. On the one hand, weak mineral prices in the 1980s were persuading countries that there was nothing particularly special - and certainly nothing particularly profitable - about the resources sector, it was just a business like any other and needed to be managed as such. On the other, many resource-rich countries had concluded that state ownership had not delivered the results it had promised and that the way forward lay in seeking to attract private investment to the sector. In arriving at this conclusion they may also have been encouraged by the increasing disillusion with mining in industrialised countries (stemming from high costs (strong currencies) and growing environmental pressures on the sector) and a realisation that this was strengthening the hand of developing nations in their negotiations with foreign investors on the development of their resources.

In any event, many countries set about revising their mining and taxation regimes with a view to making themselves more attractive to foreign investors. In the process, the World Bank played a prominent role, both in cajoling recipients of Bank funding to adopt more market-friendly policies and in providing significant technical and legal assistance to those undertaking reform in developing countries.² Between 1985 and 1996, it is estimated that over one hundred countries had revised, or were embarked on the revision of, their mining regimes. (Otto 1996) Some countries began to reverse the process of nationalisation. In the UK, after facing down a bitter strike in 1984 -85, and demonstrating in the process that the domestic coal industry had lost its 'strategic' status on account of the growing availability of local gas supplies and cheap imported coal, the government of Margaret Thatcher broke up and privatised the UK coal industry.

² This liberalization of mining regimes in developing countries did not, it might be noted, translate into a large and fast redistribution of global production of minerals. This is partly because mineral production, being long-term and capital intensive in nature, tends to be very 'sticky', but also it is because the mining regime is only one of a number of factors mining companies take into consideration when deciding whether or not to invest in a mine; political risk and mineral prospectively are obviously other important considerations. It has been pointed out that, in practice, much of the additional investment flowing to developing countries as a result of these changes was concentrated on relatively few commodities (notably copper and gold) and relatively few countries (notably Chile, Peru, Indonesia and Papua New Guinea). (Bridge 2004)

4.2 TNC-host nation relations

This change in the ideological environment helped hugely to revive the fortunes of the mining TNCs. Having been treated as pariahs by many resource-rich developing countries through the preceding decade, some of these same countries were now soliciting the interest of foreign miners to participate in the development of their resources. Even UNCTAD, which had hitherto been generally critical of the mining TNCs, began to adjust its message to the changing times, becoming at once more supportive of foreign direct investment and turning its attention towards the terms and conditions under which such investment could benefit the economies of host nations. A landmark investment of this period was the investment by BHP (now BHP Billiton) and RTZ (now Rio Tinto) in the large Escondida copper mine in Chile at the end of the 1980s. Chile had been one of the lead countries in banishing foreign investors and nationalising its mining sector almost twenty years previously.

The new period in the life of the global mining industry was marked by growing collaboration between international miners and mineral-rich host countries. This was based both on a more equitable division of power in the relationship between host country and foreign investor than had existed in earlier eras and on a deepening consensus about the conditions required for mutually beneficial mining development – most notably, security of tenure and predictability in regulation and taxation – and the need for an equitable division of the rents from mining. Glue for this more collaborative spirit was provided by the persistently unfavourable nature of the mineral markets through much of the 1980s and 1990s and the need of all parties to mining investment to keep closely focused on basic business realities. It may also have been assisted by the recognition that, in contrast to foreign investment in the era of colonialism when overseas mining development was frequently driven by the need to supply the home country with raw materials, foreign investment in mining during this new era was very much more focused on supplying global markets, an increasing proportion of which were in developing countries.

4.3 Community conflicts

With a growing consensus between the industry and the state at a national level, more prominent fault lines of conflict began to be exposed at a community level. This was in part a natural response to concerns that a central government focus on the broader economic benefits of mine development might result in inadequate attention being paid to the interests of the people mostly directly impacted by such development. Communities in the vicinity of mines naturally wanted to ensure that they got their share of the jobs and fiscal revenues that mining investments generated. By dealing directly with mining companies, communities were often able to apply pressure both on the companies and on their own governments. Challenges to companies over the impacts of their activities could be particularly effective where they were able to tap into pre-existing conflicts associated with ethnic, religious or political divisions. And such pre-existing conflicts are, of course, widespread in many

mining countries. Thus, for example, mining companies in Australia have long had to confront issues associated with the territorial claims and human rights of the aborigine population. Miners in the Philippines have frequently run into opposition to their activities from the Catholic Church. While Freeport-McMoRan's Grasberg mine in Indonesia has long been the focus of discontent for West Papuan separatists.

Foreign investors, by the same token, were having to become much more alert to the issues of the communities in which they operated, often investing heavily in social infrastructure, not simply as a means to head off dissent but, more positively, because companies were coming to recognise that having local communities as partners and advocates significantly strengthened their hands in negotiations with central government. Accordingly, many global mining companies began to develop extensive programmes of community engagement to foster co-operation, involving small business partnerships, community support schemes, educational activities, health clinics, conservation programmes, sports sponsorship, and participation in regional economic development initiatives.

Prior to committing investments, many companies were undertaking exhaustive consultation exercises to tease out potential difficulties and address them up front. As mining companies had found in the past to their cost, while the establishment of mines creates groups who benefit ('haves'), they also create groups who do not benefit at all ('have nots') and who in fact are marginalised and impoverished by mine developments. Identifying these latter groups and bringing them into the dialogue before mines are committed may turn out to be critical to a mine's longer term success. Such consultation exercises commonly take several years to complete but in the context of mines which may operate for thirty or forty years this may be time well spent. In short, companies were finding that having policies which proactively addressed the concerns of local communities could create stable collaborative relationships which served both their business interests and the economic and social interests of the local communities in which they were operating.

4.4 Environmental concerns

In addition to these economic and social issues, the other factor prompting conflict at a community level was a growing concern over the environmental impact of mining. Unlike some sectors where the environmental impacts can be quite dispersed (e.g. emissions from cars and power stations) the environmental impacts of mining tend by their nature to be local and intense. Such impacts vary considerably according to the type of mining involved. Underground mining, although it can bring with it problems of subsidence, generally has a relatively small footprint at the surface. Strip mining for bedded minerals like coal, bauxite, nickel oxides and titanium beach sands, despite its rather sinister name, is actually one of the more environmentally benign forms of mining since it is generally superficial and permits almost complete rehabilitation of the ground and its natural vegetation after the mineral has been removed. Other forms of mining pose bigger problems. Open-pit mining creates large holes and waste dumps which are unsightly, the exposure of sulphide rocks to the elements can result in acid rock drainage into ground water, the disposal of effluent and particulate

matter from concentrators can find its way into rivers and the sea, cyanide used in gold recovery carries the risk of toxicity, while mines and associated infrastructure and equipment can represent a hazard for migrating animals.

While such concerns over the environment were hardly new, it is probably fair to say that public awareness of these matters had grown persistently since the early 1970s when such issues were brought to public attention by such publications as *Blueprint for Survival* and *Only One Earth*. (The Ecologist 1972, Ward and Dubos, 1973) Non-Government Organisations (NGOs) were playing an increasingly active role in ensuring that the local communities exposed to mining were made aware of its environmental consequences, a role that was greatly facilitated by developments in information and communication technologies such as the internet and mobile telephony. As with the case of their economic and social impacts, the mining industry (or at any rate the larger companies within it) was working to raise its standards through research and on-the-ground activities so as to increase the public acceptability of its operations. The websites of mining TNCs were filling up with statements about their commitments to good environmental practice with data and illustrations on their work in this area. Because of the nature of the industry, however, and the intense feelings that these matters give rise to, this remains a major fault line for conflict between miners and the communities in which they operate.

There are numerous examples of environmental flashpoints, some of the most high profile involving mine tailings, a particularly challenging issue for the industry. (Mine tailings are a slurry containing the waste particles which result from the grinding up of metal ores as they are processed into metal concentrates.) Thus the river dumping of tailings by the Grasberg mine in Indonesia and by the Ok Tedi mine in Papua New Guinea have been a persistently source of friction locally, as has the marine dumping of tailings at the Lihir Gold Mine in PNG and the Batu Hijau mine in Indonesia. Dam breaks at the Omai mine in Guyana in 1995, at the Marcopper operations in the Philippines in 1996 and at the Baia Mare mine in Romania in 2000 provoked loud public outcry against the mining companies concerned (whilst drawing widespread public attention to the environmental risks of mining), the latter having the additional complication that the polluted water flowed across the border into one of Hungary's largest rivers, the River Tisza.

4.5 Artisanal mining and conflict diamonds

The other important context in which mining activities were leading to local conflicts during this period was in the unregulated sector of informal, artisanal mining. While such mining has always existed, the high gold prices of the early 1980s gave rise to a rapid expansion of the sector, bringing it to public prominence. In Brazil, it is estimated that there were some 350,000 *garimpeiros* operating in the informal gold sector in these years, this against less than 9,000 employees in the formal mining sector. (Hanai 1998). These primitive, pick and shovel operations, working shallow alluvial ores, were not only damaging environmentally (not least because of their use of mercury for the recovery of the gold) but they also brought with them conflicts with the indigenous peoples in the areas they were operating. Particularly

affected were the Yanomami people, who inhabited the region north of the state of Roraima in Amazonia, whose culture and health were badly impacted by *garimpo* activities. Concerned at the social and environmental consequences of such mining, the Brazilian government at the end of the decade moved to regularise the sector, formally recognising the claims of the *garimpos* within the country's constitution in exchange for making them subject to environmental legislation.

Much more problematic were the activities of informal, artisanal miners in countries where governments lacked the capacity to regularise these activities or where the mining activities were being used to fund opposition to elected governments. This was a widespread problem in Africa, particularly with respect to the mining of diamonds. Revenues from diamonds helped sustain the military activities of UNITA in Angola even after the elections confirming the legitimacy of the MPLA government of 1991. This led in 1998 to the UN adopting a resolution prohibiting the import of diamonds from Angola which were not officially certified by the Angolan government. Sales of diamonds were also used to support the RUF (Revolutionary United Front) in their civil war against the incumbent government of Sierra Leone. In 2000, the UN passed a resolution on Sierra Leone similar to that for Angola. Other countries in Africa involved in the sale of diamonds for the funding for military activities and the purchase of weaponry were Liberia, Côte d'Ivoire, DR Congo and Republic of Congo. In December 2000, the UN General Assembly unanimously adopted a resolution on the role of diamonds in fuelling conflict, with a view to breaking the link between the illicit transaction of rough diamonds and armed conflict, and as a contribution to the prevention and settlement of conflict. At the same time, the UN acknowledged the role that the legitimate production and sale of diamonds could make to prosperity and development. Also in 2000, the global diamond industry committed itself to the introduction of a universal diamond certification process to squeeze out what had become known as 'conflict' (or 'blood') diamonds. The certification process, termed the Kimberley Process, became effective in 2003.

Alongside the enormous scale of the global mining industry, the economic significance of conflict diamonds is small indeed. Even within the diamonds sector itself, the trade in conflict diamonds is estimated to represent significantly less than 1% of the value of all diamonds sold. (World Diamond Council 2010) However, the glamorous nature of the product concerned and the particular brutality of the conflicts which the sale of conflict diamonds have funded, have given the issue a symbolic significance far in excess of its economic importance. Unquestionably, the negative image of the mining industry to which the issue has given rise in the public mind has gone well beyond Africa and beyond diamonds. Revenues from the sale of coltan (columbite-tantalite), cobalt, tin, tungsten and gold have all been the subject of concern about abuses in the DR Congo. (Melcher 2008) In July 2010, a legal action was launched in the UK courts against the government for not intervening to prevent UK-based companies producing a range of minerals in rebel-controlled areas of DR Congo. (BBC 2010)

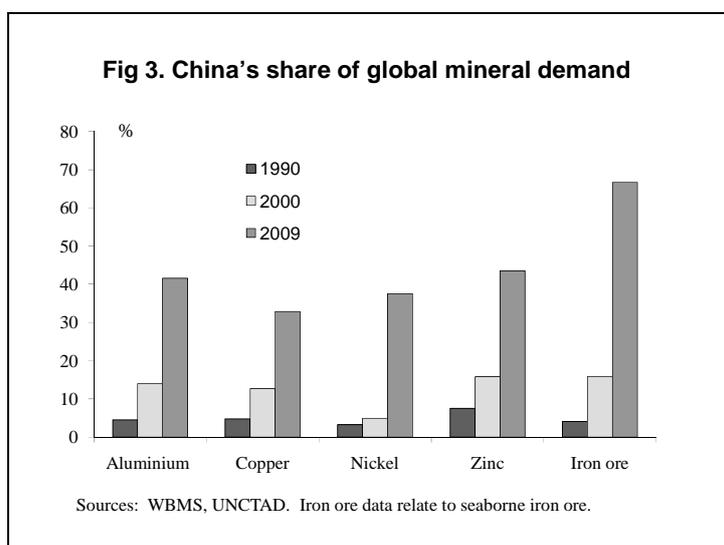
The issue of conflict diamonds also serves to make rather starkly a critical point which does indeed go across all minerals and all regions, which is that good governance is always and everywhere critical to the operation of a peaceful, productive and socially responsible mining industry, based on mutual trust and willing collaboration. A key observation of the multi-stakeholder research project, Mining, Minerals and Sustainable Development, was that in the absence of national authorities with clear public legitimacy and applying sound principles of governance, the potential for conflict to arise from mining will always exist. (MMSD 2002)

5. 2000s: emerging economies and the return of resource nationalism

5.1 The growth of China

The world into which the mining industry is moving in the twenty-first century is only now taking shape and any conclusions about where the fault lines of conflict will appear must necessarily be somewhat tentative. Some of the characteristics of this world are nevertheless already apparent. The ‘new normal’, as it has come to be known, is a world in which emerging market countries will play a prominent and expanding part in the global economy, and thus its polity. Moreover, while capitalism may have triumphed as a result of the ending of the Cold War, the model coming to prominence in this new century is not that of market capitalism but, increasingly, that of state capitalism.

The rapid economic growth of China is re-shaping global economic and political relationships while the upsurge in the demand for mineral products needed to fuel its industrialisation has helped transform the fortunes and prospects of the mining sector. China’s growing share of global mineral demand is shown in *Figure 3* below. It might be noted that this was not a situation that was supposed to occur according to the world view at the time of the Brandt Commission when it was considered axiomatic that the countries of the north would always provide the primary dynamic for mineral demand.



Demand from China was a key factor helping to drive the commodity price boom of 2003-2004, a boom which effectively marked a transition to a new and distinct phase in the life of the minerals industry, much as the price boom of the late 1960s and early 1970s had marked a similar transition thirty years before. (Humphreys 2010) As with the earlier boom, higher mineral prices, combined with the conviction that these would have a sustained impact of mineral asset valuations (there was much talk of a mineral ‘super cycle’), triggered a new round of rent-seeking behaviour. Specifically, it stimulated a renewed interest from the state in the mining sector and led to the state’s increased involvement in its affairs worldwide. If growth in demand from the emerging economies is the first key characteristic of this new chapter in the life of the industry then the growing role of the state is the second. The emergence of these two influences potentially brings with it a whole new range of conflicts and, perhaps, the resuscitation of some old ones.

5.2 China’s ‘go out’ policy

In the years following its economic liberation by Deng Xiaoping, China was for the most part content to source its raw materials from domestic resources which it supplemented by buying supplies on the open market. While China was a marginal player in the global market, this was an appropriate and cost-effective strategy. However, by the early part of the 2000s, China was consuming something around a fifth of the world’s minerals. In 2004, faced with global markets which were clearly struggling to meet its rapidly growing demand for raw materials, and concerned lest this might impose a brake on its industrialisation, the Chinese government started to adopt a more assertive attitude with respect to securing its supplies. In this year, it promulgated a ‘go out’ policy, exhorting its large companies (many of them state-owned) to seek out and secure supplies for home consumption by investing in natural resource projects overseas. In 2007, it added force to this mission by establishing a sovereign wealth fund, China Investment Corporation (CIC), with an endowment of \$300 billion for foreign direct investment, which was to include investment in minerals.

With commodity prices hitting record highs, and few mineral assets available at reasonable cost, progress in this mission was initially slow. The first investments by Chinese companies were early-stage development projects and minority stakes in foreign mining operations made in return for supply off-take agreements, rather than outright purchases of existing mining companies. This reticence towards outright acquisition was doubtless in part attributable to the political storm unleashed in Canada by the attempt of China Minmetals to acquire Canadian miner Noranda in 2004.

Following the downturn in commodity prices during the second half of 2008, which not only reduced asset values but also made companies more open to the approach of new investors, Chinese companies stepped up the pace of their buying. Thus, for example, Chinese aluminium producer Chinalco acquired 9% of Rio Tinto in 2008, while in 2009 China Minmetals acquired the assets of OZ Minerals, Hunan Valin acquired 18% of Australian iron ore producer Fortescue Metals Group and CIC acquired 17% of Canada’s Teck Resources.

(Humphreys 2009) Nevertheless, significant opposition remains to the expansion of China's participation in the sector in this way and all has not gone smoothly. Minmetals was debarred by Australia's Foreign Investment Review Board (FIRB) from acquiring the Prominent Hill copper mine as part of its bid for OZ Minerals, while FIRB effectively blocked the attempt of the China Nonferrous Metals Corporation (CNMC) to acquire the Australian rare earths producer, Lynas Corp. Opposition from Rio Tinto's other investors played a part in preventing Chinalco from increasing its stake in the company during 2009. Continuing acquisitions by state-owned Chinese companies are likely to remain a source of latent conflict with western countries in the future.

As in the case of oil, China's quest for mineral supplies has also been leading it deeply into Africa, giving rise to a rather different range of stresses. China's approach to mining investment in Africa has shown marked differences with that of western TNCs. While western companies have shown extreme caution in investing in the region because of the social and environmental challenges they confront in Africa and the associated risk to shareholders funds, Chinese companies have shown little fear or restraint. Such companies are typically much more focused on the long term strategic nature of investment and many of them, being state-owned, are not constrained in the same way by the concerns of private investors.

For the most part, these investments have been welcomed by host governments. In part this is because China's investments have often come with significant additional development aid for infrastructure and power. It is probably also because China's principle of non-interference in the affairs of other countries makes it less judgemental about the nature of the regimes it is dealing with and less likely to demand tough conditions in exchange for its investment. However, while governments can do deals with companies, this does not always mean they bring their people with them, as the western TNCs found in the days of neo-colonialism, and the Chinese tendency to import large numbers of their nationals to staff their operations in Africa has created significant tensions at a local level. Press reports talk of frequent clashes between Chinese and local populations (The Economist 2006), while the presence of large numbers of Chinese in the country was a prominent issue in Zambia's elections in 2006 and 2008. More recent mining development agreements between the Chinese and the government of the DR Congo have had written into them clauses restricting the number of Chinese workers permitted to work on the projects. (Komesaroff 2008) Chinese investments in Latin America have similarly run into local resistance. For example, Zijin Mining has faced vigorous opposition from local groups to the development of the Rio Blanco copper mine in Peru.

5.3 Resurgence of the state

The growing participation of the state in the global mining industry is by no means confined to China. The metal price boom of the mid 2000s led the governments of many mining countries to the view that they were receiving an inadequate share of the rents from mining. Many countries which had established their mining regimes during harder times, in the 1980s

and 1990s, with a view to attracting foreign investment, revised their mineral royalties and taxation regimes in response to these new, more buoyant market conditions. These countries included Chile, Peru, Zambia, Tanzania, South Africa, Indonesia and Vietnam. (The Economist 2007) There was also a revival of interest in the notion of nationalisation, particularly in Latin America, with Venezuela, Bolivia and El Salvador all taking mining operations back into state ownership or revoking mining permits previously awarded to foreign mining companies. (Lozano 2009) In 2007, the government of Zimbabwe passed legislation aimed at indigenising control of certain key sectors, including mining, by requiring them to be 51% owned by local interests. The legislation came into force in March 2010.

Another aspect of this growing resource nationalism is the increasing prominence on the global mining scene of mining companies from the emerging market economies. While these are not necessarily state-owned or state-run companies, they are nevertheless in many cases strongly national companies, having grown up largely in one country and being perceived in some sense as national champions. These include such companies as the state-owned copper producer, Codelco, in Chile, and the publicly-quoted Vale (formerly CVRD) in Brazil. They also include a number of companies from former communist countries such as Norilsk Nickel and RusAl from Russia, Kazakhmys and ENRC from Kazakhstan and KGHM Polska Miedz from Poland. Benefiting from a strong local resource base and new-found access to global capital markets, these companies have grown strongly in recent years. (Humphreys 2009)

The emergence onto the global stage of such state capitalist enterprises from China and elsewhere is posing a major challenge for the western mining TNCs. Having devoted enormous efforts over recent years to the issue of Corporate Social Responsibility (CSR) and to upgrading their environmental performance with a view to positioning themselves as ‘developers of choice’, they find themselves in some parts of the world competing with companies from elsewhere on wholly different grounds to those they had expected. Despite the tidal wave of mining reforms in the 1980s and 1990s, the number of countries in which these companies can invest, confident in the knowledge that their permits and their assets will be protected under the rule of law, are still quite limited, and may even be shrinking.

The military regime of Guinea which came to power in December 2008 determined that all mining rights issued under the previous regime would be reviewed, including Rio Tinto’s licence for the giant Simandou iron ore project and RusAl’s licence for the Friguia bauxite-alumina operations. (Significantly, it was also reported to have struck a strategic mining alliance with the Hong Kong-based China International Fund in October 2009.) This followed a similar initiative by the incoming government of DR Congo in early 2007 under which it pledged to review over sixty mining licences issued under preceding regimes during 1998-2005, and which resulted in several companies having their licences withdrawn. In countries featuring dominant national players, such as Russia and Kazakhstan, the inside knowledge and political contacts of the domestic players will always put outsiders at a competitive disadvantage, requiring them, if they are to invest in these countries at all, to do so in partnership with a local enterprise.

In short, the industry is moving into a world where business relationships will have a less legalistic and more political foundation. The world is not going to be reshaped by the triumph of liberal democracy as some believed at the end of the Cold War. Weak application of law along with uncertainties over taxation will likely create many flashpoints for conflict between companies and governments in coming years. Companies will increasingly find themselves having to deal with governments and to negotiate the terms of their investments on an *ad hoc* basis.

The lengthy negotiations between Ivanhoe Mining and Rio Tinto on the one side and the government of Mongolia on the other over the development of the large Oyu Tolgoi copper mine (finally concluded in 2009) may represent the pattern of things to come. If so, then it is likely that the mining TNCs will increasingly have to look to their own governments to bolster their positions in negotiations and provide them with quasi official status. In this process, it may also be that lines between what is politics and what is business will become increasingly blurred. The arrest of four Rio Tinto employees by the Chinese state authorities on charges of industrial espionage in 2009 helped highlight the potential problems that can arise when the lines between business and state activities lack clarity. Potentially, the mining TNCs are looking at a future not unlike that of the IOCs (International Oil Companies), ruled out of operating in certain mineral-rich regions by political and legal uncertainties and forced to compete in others on disadvantageous terms. Viewed against this backdrop, the wave of M&A amongst western TNCs during the 2004-2008, which revealed a preference amongst these companies to grow by acquisition of like-minded companies rather than by undertaking high risk new investment, is the more easily understood.

6. Pointers to the future: fragmentation and volatility

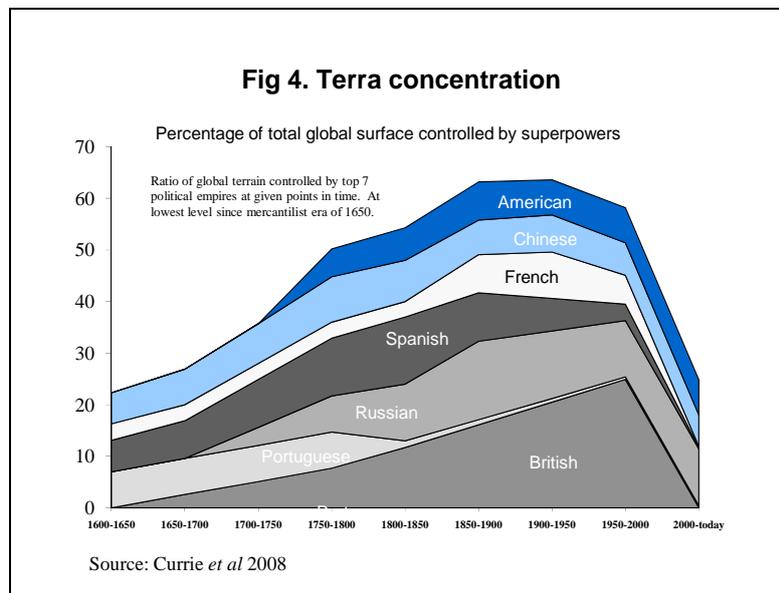
6.1 Geopolitical fragmentation

Although the focus of this chapter is history, this final section offers some reflections, following from the historical analysis, on some of the factors that are likely to shape the policy landscape for the mineral industry in the years to come.

The new normal is multipolar and multilayered. It lacks the simple bi-polarity of the Cold War years and the unifying influence which was provided by US hegemony in the post-Cold War era. At the same time, decreasing central government authority in many countries, combined with the radical effects of improved communications technologies, have empowered local communities across the globe. The potential for conflict in the mining sector within this complex and volatile world is considerable. By the same token, the rewards for understanding what is going on and building models of collaboration to address nascent conflict are also potentially large.

With regards to global multipolarity, the strong economic growth of China and the other BRICS countries has been steadily breaking down US economic dominance and dispersing economic and political power more widely. Goldman Sachs in its research on commodity

markets has employed a notion of ‘terra concentration’, the term signifying the amount of the earth’s surface falling under the control of one of the great powers of the day. They point out that the world’s natural resources have not been controlled by so many separate political entities since the seventeenth century when mercantilism was the ruling economic ideology. The notion is shown graphically in *Figure 4* below.



This fragmentation of control need not be a problem for mineral supply if capital is free to move around the world. But this is not the case, as has been discussed above. There are significant barriers to the free flow of capital in the mining sector and they appear to be growing. Goldman Sachs is led to conclude that the fragmentation of control over resources and the protectionism of resource nationalism are resulting in inadequate and inefficient industry investment, as a consequence of which supply will be constrained below where it would otherwise be and commodity prices will remain under strong upward pressure for years to come. The problem, as Goldman sees it, “is about the supply of capital, not the supply of the commodity”. (Jeffrey Currie 2008) While Goldman Sachs’s thinking on this matter is strongly shaped by the oil sector, where resources tend to be more geographically concentrated than in the case of minerals, the argument nevertheless is highly relevant to the minerals sector.

6.2 Response of traditional importing nations

Unsurprisingly, observations of this sort have led to renewed concerns over the security of supply of minerals in some of the world’s large consuming nations, just as happened following the commodity price booms of the 1970s. Whereas the concerns last time around were over South Africa and the Soviet Union, this time the focus of concern is China, and the

fear that its buying behaviour and pre-emptive investment might leave other consuming regions struggling to obtain supplies. There are differences also in the commodities which are the focus of concern. The growth in the importance of electronics to industry and to the military during the thirty years since this was last a major agenda item, has thrown the spotlight onto the so-called electronic metals like indium, tantalum, ruthenium, germanium and, above all, the rare earth metals for which China dominates global supply.

In November 2008, the European Commission launched a Raw Materials Initiative, drawing attention to the supply concentration of these metals and the need for open and free markets in them to ensure their continued availability. (European Commission 2008) In its press release, the Commission noted that “In the making of a mobile phone...40 different raw materials are used, like lithium, tantalum, cobalt and antimony, all of them more and more difficult to get. A computer or television screen contains the same metals.” In the same year, a committee of the US National Research Council of the Academy of Sciences published a report looking at these issues and had this to say:

“In the 1980s, computer chips were made with a palette of twelve minerals or their elemental components. A decade later, 16 elements were employed. Today, as many as 60 different minerals (or their constituent elements) may be used in fabricating the high-speed, high capacity integrated circuits that are crucial to this technology.” (National Research Council 2008)

In the past, it is probably fair to say that concerns over strategic minerals, while they have occupied a lot of press and policy makers’ time and attention, have not resulted in any major problems of supply availability. The inherently inelastic nature of mineral supply (it takes several years to prove up and start a mine) means that there are inevitably periods when demand runs ahead of supply, resulting in temporary shortages. However, the market is usually fairly effective in sorting this out, with increased prices choking off demand in the less critical uses of a material while at the same time stimulating investment in new supply. Few commodities are really that scarce in nature and there are few examples that one can point to in history where shortages of minerals have precipitated major economic problems.

However, in a world where the demand for strategically important metals is rising strongly, the competition for limited supplies does have the potential to become a source of conflict. The decision of FIRB in Australia to block the purchase of rare earths producer, Lynas Corp, by a Chinese company was in part motivated by a concern that China would be increasing its grip on the global supply of this important commodity. China is estimated to control over 95% of rare earths production globally and is reportedly restricting exports of rare earth raw materials so as to ensure availability of supplies to its domestic users. (Milmo 2010) Conflict over such matters will perhaps be aggravated by the sense that, in this contest for resources, private western companies are being subject to unfair competition from state-backed organisations.

Another focus of concern which has re-emerged in consuming countries in recent years relates more to the issue of the physical availability of minerals rather than geopolitical availability. This is not so much a concern that resources may be ‘running out’ as was the case at the time of the Club of Rome study of the early 1970s (Meadows *et al* 1974), but rather a concern that the increasing cost of producing mineral raw materials may obstruct the timely development of new resources. There are strong grounds for believing that, for many mineral commodities, the more accessible, lower cost, resources have already been exploited and that in future miners are going to have to turn to smaller, deeper, lower grade or more remote deposits. This will involve higher capital expenditures and higher operating costs. Companies will have to be persuaded that they can manage the risks involved in taking these projects on and that commodity prices will be sufficiently high to warrant them doing so. Although there are many who believe that prices have moved onto a higher plane since the boom of 2003-2008 and that the long price downtrend since the 1970s has been reversed, there is still much debate about the scale of such price rises and it could yet prove that new supplies come through at a slower than mineral consumers would like.

6.3 Growing divide between producers and consumers

Embedded in the increasing fragmentation of global supplies is another issue, which is the growing distance between producers and consumers of minerals. In the world of colonial powers, both the production and use of minerals tended to fall under control of the same set of countries. Even in the post-WWII era of economic dominance by the OECD countries on the one hand and the Soviet Bloc on the other, it was still generally the case that the same group of countries dominated both the production and consumption of minerals. In these circumstances, there was a clear self-interest in mineral-consuming countries devising and implementing policies which encouraged investment in mine development.

However, recent years have seen the extent of this overlap between producers and consumers diminish (a development facilitated by advances in bulk transportation), progressively removing this element of consumer self-interest from the process. Much of the growth in demand for minerals in these years has come from East and Southeast Asia, most notably China, South Korea, Taiwan, Malaysia and Thailand, countries whose limited resource endowments make them natural importers of minerals.³ At the same time, much of the supply growth in minerals has come from emerging market countries with quite limited domestic demand, for example, Chile, Brazil, Russia, Central Asia, Indonesia and southern Africa, and from the large developed world net exporters, Australia and Canada.

These trends are changing the dynamic of producer-consumer relationships and placing producers and consumers of minerals into two separate camps with somewhat opposed interests. While in principle the market should be able to mediate efficiently between the two

³ China is clearly a major mining country, particularly if one takes account of coal and industrial minerals. It remains the case, however, that a very substantial proportion of its domestic production of the most economically important metals, steel, aluminium, copper, nickel and zinc, are based on imported raw materials.

groups and provide economic benefits to both, in practice, for producers without significant resource-consuming interests, the principal concern in an era of state capitalism will tend to be the profitability of their activities rather than ensuring abundant low-cost supplies to consumers and this goal may be as well served by restricting supply and keeping prices higher. (Once again, the parallel with the oil industry and the activities of OPEC come to mind.) At the same time, attempts by consuming countries to reduce their dependence on mineral imports risks depriving producing countries which want to develop their resources of the opportunity to use these resources as levers for economic development. The combination of these pressures potentially sets up mercantilist-style nation-based conflicts between those countries with the resources and those that use the products from them.

Given the widespread uncertainties about the development benefits of mining in some parts of the world, some resource-rich countries may feel they have very little to gain by developing their resources to serve the consumption needs of other countries and that they are better off leaving their resources in the ground until such time as they have need of them themselves. Guinea has substantial natural resources but seems in no particular hurry to see them developed. In its dealings with Barrick Gold and Antofagasta over the Reko Diq copper-gold project in south-western Pakistan, the provincial government of Baluchistan is taking the view that if the project cannot be developed by local interests it should not be developed at all. (Reuters 2010) In a world in which statist relationships are going to be ever more important to developments in the industry, China is better equipped than most to prosper.

6.4 Sub-national stresses

If the vertical issues of multipolarity represent a growing fault line for conflict in the minerals industry then so also do the horizontal issues of multiple layers of authority - the state, the region, the sub-region and the community. As has been shown by its history, the scope for conflict at the national and regional level is always present in the mining sector. In more recent decades, local communities have found their voice too and this voice is likely to get louder rather than quieter in coming years. Indeed one of the paradoxes of the era of economic globalisation is that it has set up strong reactions at the local level, at the same time providing technologies with which local communities can more effectively fight global organisations.

Stresses at the community level arise from a multiplicity of sources, from concerns over the distribution of the rents from mining, concerns over the impact of mining on the environment or on local culture and traditions, and from competition from other lands uses, such as recreation, wildlife or water. The examples are too many to list but some prominent ones in recent years have been aborigine opposition to the development of Rio Tinto's Jabiluka uranium mine in the Northern Territory of Australia, the opposition of local tribes people to Vedanta's bauxite mine in the Niyamgiri Hills in the eastern state of Orissa and the opposition of salmon fishermen and conservationists to the development of Northern Dynasty/Anglo-American's proposed Pebble copper mine in Alaska. The mining industry is

acutely aware of the risk posed by such community opposition and of the consequent importance of having strategies to anticipate and manage such conflicts and to cooperate with local community organisations in promoting the development of their local economies. Thus, the industry's representative body, the International Council on Mining and Metals (ICMM), has recently published a report detailing, how, with a series of case studies, mining companies can contribute to poverty alleviation, economic and social development and dispute resolution. (ICMM 2010)

In an increasingly densely populated world, with diminishing areas of wilderness and diminishing supplies of water on the one hand, and an increasingly sophisticated population on the other, these tensions around mining activity can only increase with time. Partly this is natural 'nimbyism' but in some cases the criticism goes much deeper, with opponents of mining questioning whether there are *any* economic benefits to be had from mining (the 'resource curse' issue) and being generally indifferent as to whether development goes ahead at all. Higher commodity prices since 2003, which it might otherwise have been supposed would have increased the economic attractiveness of the mining industry, have in fact had a habit of aggravating local pressures by inflating expectations about what resources are worth and fuelling suspicions amongst communities and work forces that they are not receiving a appropriate share of the available rents. These community and labour issues are not just for the developing world. They are big issues for the developed world too, especially where they bear on environmental concerns. The area which is now Yosemite National Park was the scene of extensive gold mining activities during the Californian rush but the prospects of being able to open a mine in the park or even near it now are negligible. That areas such as this, and Cornwall in the UK, should be treasured as valuable pieces of industrial archaeology may have a certain quaint irony about it, but it does not alter the basic reality confronting today's industry.

6.5 Pressures on mineral uses

A final potential fault line for conflict over minerals relates not to how or where minerals are produced but to how they are used. This has not on the whole been a major issue in the past. Environmental NGOs have long protested about the environmental impacts of gold mining on the grounds that gold serves no real social purpose (No dirty gold 2010), but such criticism has hitherto rarely had any material impact on real world decisions. Uranium has also been a focus of concern on account of its radioactive nature and the consequent risks posed by its recovery, transportation and processing as well, of course, as its potential uses in the production of nuclear weapons. Because of these risks, the industry's operations are monitored on behalf of the global community by the International Atomic Energy Agency (IAEA) while the Nuclear Non-Proliferation Treaty of 1970 exists to limit the spread of nuclear weapons. However, the refusal of Iran to co-operate with the global community on these matters well illustrates the limitations of these powers when they are challenged by states which believe they conflict with their national interests and sovereign rights. The

renewed interest in nuclear power because of climate change is leading to an increase in uranium production and will presumably aggravate this problem further.

For the future, the use of coal may come more into the spotlight because of its alleged role in climate change. Coal emits more carbon per unit of heat delivered than oil and gas. On the other hand, it is widely available throughout the world and plays a major part in power generation in the two emerging industrial giants, China and India. These countries have limited power generating options so the use of coal will not be easily or quickly curtailed. Accordingly, while in the past the primary focus of concern and of conflict for the mining industry has tended to be on the upstream issues of access to minerals and the impacts of mineral recovery, it is possible in the future that more attention will be directed towards the downstream issues of minerals use and the capacity of the planet to absorb the impact of the continued growth in use. As the debate over climate change well illustrates, this has the potential to stir up a major north-south rift with strong echoes in history.

7. Conclusion

This chapter has tracked the mining industry through two hundred years of history and sought to identify some of the major sources of industry conflict during this period. This analysis, it is hoped, will generate some useful learnings for the subsequent stages in the Polinares project on how to identify conflict flashpoints and how to structure policies to avoid, or to better manage, conflict in the future. A key point to emerge from the analysis is that the locus on conflict moves around with time. Early conflicts in mining flowed from the essentially enforced nature of many of the relations within the industry; notably, the subjugation of workforces and colonial oppression. In the post-WWII period, the focus of conflict shifted more towards the level of the state and was marked by inter-state conflicts over ownership and control of mineral resources. Subsequently, the focus shifted more towards the regional or community levels and towards environmental issues, including the issue of the use of minerals. In coming years, it is likely that the world will see vestiges of many, if not all, of these conflicts running concurrently. Contemporary issues identified as of particular interest in shaping the future policy context are the growing role being played in both mineral production and mineral consumption by emerging market economies, a resurgence of the role of the state and of resource nationalism in the minerals sector, and the diminishing overlap between the cast of world mineral producers and mineral consumers.

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