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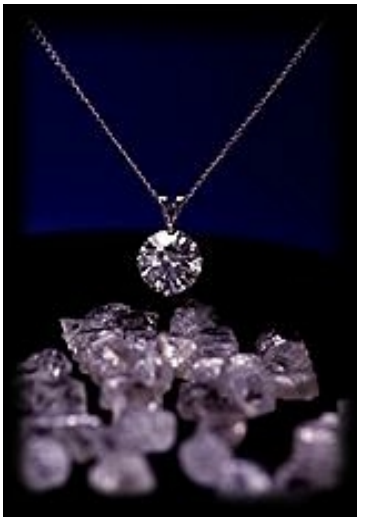
De Beers' new strategy

In what is described by its chairman, Nicky Oppenheimer, as "one of the most significant developments the diamond industry has seen since the 1930s", De Beers this week unveiled a new strategy whereby it will abandon its long-held role as custodian of the diamond market, and focus instead on boosting demand. Since the depression years of the 1930s when the price of diamonds slumped, De Beers has stockpiled the world's surplus diamonds as a means of controlling supply (and prices). Under the new strategy, the stockpile is not being eliminated but it will be substantially reduced – to a working level of around six months' supply, equivalent to some US$2.5 billion. According to Gareth Penny, the De Beers executive mainly responsible for developing the new strategy, the working-stock level should be achieved towards the end of next year, or even sooner. At the end of 1999, it stood at US$3.9 billion.

De Beers will no longer underwrite the market as a buyer of last resort. Instead, it aims to be the 'supplier of choice'. However, it currently sells about two thirds of the world's annual supply of rough diamonds, and the mines that it manages contribute about 40% of world production. Hence it remains very much the dominant player, and intends to continue to sell diamonds to selected clients through its regular sales or 'sights' held roughly every five weeks.

There will be some marked changes though in how the sights are conducted. At present, they are characterised by their opacity. The 125 selected sightholders or diamantaires – it is estimated that as many as 900 diamantaires are on the 'waiting list' – have no formal contract with De Beers, nor any control over the quality, quantity or the price of the 'parcel' of diamonds they are offered. De Beers decides what the market can absorb and customers are given their allocations accordingly on a take-it-or-leave-it basis. As from July next year, legal contracts with the sightholders *Continued on p.19*



(Photograph courtesy of De Beers).

Falconbridge joins in Gag

The Canadian nickel producer Falconbridge Ltd is to join the Gag Island lateritic nickel project, in the eastern part of the Indonesian archipelago, as project manager of a new joint venture. Gag Island is currently held 75% by Broken Hill Proprietary Co. Ltd (BHP) of Australia and 25% by the Indonesian mining company PT Aneka Tambang. Falconbridge will earn a 37.5% interest from BHP by investing US$75 million in the project, with BHP retaining 37.5% and Aneka Tambang 25%.

BHP has been planning to bring in a partner experienced in the nickel business, and the funds injected by Falconbridge will be directed mainly towards completing a feasibility study, over the next two years, under the Canadian company's management. According to BHP, the feasibility study "may lead to development of the project", but the company stresses that there is no commitment to proceed beyond feasibility at this stage.

Establishment of the joint venture is subject to a number of conditions, of which three are highlighted as key. First is the clarification of commercial arrangements with Aneka Tambang. The latter's interest in Gag Island, a seventh generation Contract of Work, is currently described as 15% free-carried and 10% loan carried, with an option to gain an additional 20% interest after 13 years of commercial operation. Although publicly listed on the Jakarta Stock Exchange, with a secondary listing in Australia, Aneka Tambang is still controlled by the Indonesian Government which holds a 65% interest in the company. The government plans to dispose of a further 14%, but would still retain control at 51%.

The second condition is clarification of the forestry classification of the land on Gag Island. Commentators in Indonesia have expressed concern over a new law which threatens to ban open-pit mining in protected forest areas (*MJ*, April 14, p.282). Thirdly, the scope of work for the proposed feasibility study needs to be established.

Gag Island has a total resource of 240 Mt, including both oxide and silicate zones, at an average grade of 1.35% Ni and 0.08% Co. The measured and indicated portions total 12 Mt and 93 Mt respectively. According to Aneka Tambang, feasibility work carried out in 1999 envisaged potential production of 61,000 t/y of nickel, and a capital cost of US$1.16 billion. □

Inside

Disposable assets

In the industrialised countries waste disposal is a mounting problem; the millions of tonnes being generated each year by a throw-away consumer society are rapidly exhausting available landfill sites and there is environmental opposition to creating new sites or to the alternative, incineration. In some instances it has been deemed expedient to pay to export the rubbish to developing countries where revenue from whatever source is very much to be welcomed.

For many developing nations, however, by far the most important source of revenues and foreign exchange is their mineral resources. Here again, it is a convenient arrangement; mines in remote parts of the world are relied upon to meet the raw materials needs of the affluent society of the developed nations who much prefer not to have an unsightly mining operation on their doorstep. It is an imperfect solution but one which is mutually beneficial.

But mining also generates waste, and worldwide an estimated 3,000 Mt is produced each year from metal mining alone. Much of the overburden and mined waste is inert and stored safely above ground or used to backfill previous mining areas (open-pit and underground). A significant proportion, as processed waste, is stored in tailings ponds which may or may not contain quantities of heavy metals. The safe containment of such waste, or lack of it in recent instances, has probably generated more adverse publicity for mining than any other single issue.

In Papua New Guinea, the Ok Tedi copper-gold mine was developed controversially in the mid-1980s without a tailings impoundment area because the steep topography at the mine site precluded dam construction. Tailings are consigned directly into the Fly River system and the operation has been plagued by complaints about pollution. The majority owner, BHP, is considering selling its 53% stake or halting operations early – remaining resources are sufficient for ten years – and a recent World Bank report has recommended Ok Tedi's closure on environmental grounds. The PNG Government, however, is anxious that operations continue.

Ok Tedi is a prime example of the range of contradictions, dilemmas and socio-political/environmental problems faced by governments, local communities and mining companies when attempting to extract minerals and metals for the greater human society and for the betterment of local communities and national income. Commentary on these issues is predominantly from non-governmental organisations, mainly based in the industrialised countries. It is instructive, therefore, to receive a viewpoint from the developing world and from someone with direct knowledge of the local situation (this issue, p.19).

Professor Bordia, head of the department of mining engineering at the PNG University of Technology at Lae, is forthright. He readily concurs that any major development such as mining will disturb the environment but argues that often it is the only source of livelihood for the local populace. Local communities, provincial and national governments, he says, will accept such development, as long as the economic trade-offs are sufficient to compensate for environmental damage.

The total economic benefits and spin-offs from Ok Tedi are huge by any world standards. The local town, once a hamlet of 500, now has a population of about 10,000, and more than 50,000 people are estimated to depend on income generated by the mine. There is no social security net in a developing country such as PNG, and Professor Bordia contends that on balance most people in PNG's Western Province (where the mine is located) would like to see its continuation.

For those environmental lobbyists "who are located far away from the real scene of action, where their governments take care of their livelihood", his message is simple – their efforts should be directed towards forcing governments in emerging countries to create basic social security support for the poor. Only when poverty is banished can the problems of pollution and environmental damage be resolved. Ultimately, he argues, poverty is by far the worst polluter.

LEADING INDICATORS

Share Indices	Jul 12	Change on week (%)	High-Low (%)	52-week Max/Min
FT 30	3,741	0.5	38	4,103-3,521
US Dow Jones	10,784	2.9	55	11,551-9,857
FTSE Gold Mines	788	1.5	16	1,232-702
Australian All Mining	677	2.9	46	771-597
South African Gold	985	–0.9	32	1,358-807
Toronto Met/Min	3,425	2.2	11	4,749-3,266
Nikkei Dow	17,342	–0.5	27	20,833-16,044
Hang Seng	17,552	6.5	90	18,096-12,438
Commodity Prices	**Jul 12**			
Gold (London)	$280.50	–2.2	38	$324-254
Copper (LME)	$1,790.50	1.4	68	$1,877.5-1,609
Aluminium (U.S. prod.)	64.50c	0.0	44	69-61
Brent Blend (dated)	$30.29	0.1	93	$31.16-18.64

HSBC Indices (100 on 31/12/88 except*†)	Jul 12	Change on week (%)	High-Low (%)	52-week Max/Min
Global Mining	119	3.6	26	146-109
Global Diversified Mining	156	3.8	29	198-139
Smaller Mining Companies	46	–0.8	20	59-43
Global Base Metal Index	149	4.7	15	204-140
North American Base Metal	347	5.9	15	489-322
Global Gold Index	53	0.9	8	78-51
Global Gold Ex S Africa	60	1.7	14	85-56
North American Gold	69	1.8	17	97-63
Global Coal Mining†	141	2.5	26	188-124
Other Metals/Minerals†	272	3.1	100	272-219
Latin American Mining*	246	0.9	61	286-182
Latin American (Ex CVRD)*	139	4.3	24	184-125

*100 on 31.12.89 †100 on 31/12/85

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De Beers unveils strategy

Continued from p.17

will be introduced, and Mr Penny says that "the level of supply will be justified against evidence of marketing criteria". A pilot system that gives sightholders supply commitments for six months at a time is already in operation, and Mr Penny expects this to "migrate in time into a much more committed set of arrangements which will be individually tailored, reflecting market abilities". In order to deliver marketing improvements, Mr Penny predicts that sightholders will have to work much more closely with retailers.

Greater emphasis on marketing is seen as the key to increasing demand for diamonds and De Beers is calling on the rest of the industry to match its own efforts, hence the preferential treatment that will be given to those diamantaires who market and distribute diamonds most efficiently. De Beers will spend US$170 million on international marketing this year but for the industry overall, the annual spend on marketing is little more than 1% of retail sales revenue. This compares with annual expenditure of 6-10% for the luxury goods market as a whole. The luxury goods market is growing at 10% per year and De Beers' managing director, Gary Ralfe, says there is "a huge untapped potential" for the diamond business to match the growth rates enjoyed by leading luxury goods companies. He sees the branding of diamonds as a catalyst for such growth.

De Beers' London-based marketing arm, Diamond Trading Co., is set to play a much more prominent role under the new strategy and is being given a "powerful new identity". Until now, the DTC has been referred to as the company responsible for sales within the Central Selling Organisation but the perpetuation of the CSO, with its monopolistic connotations, is no longer deemed prudent. The DTC sorts and values the rough diamonds shipped to London (into some 14,000 categories) and is at the interface with sightholders.

To ensure continued consumer confidence, the new strategy includes the establishment of a code of professional and ethical standards – best practice principles – and the DTC will be responsible for ensuring that sightholders comply as a condition of sale. These principles are intended to reassure customers in the distribution chain, as well as consumers, that the diamonds they purchase are not, for example, so-called 'conflict diamonds'.

Finally, De Beers says that it is offering to sightholders an extensive package of "world-class value-added support services, including training, marketing, business-planning support and market research".

Mr Oppenheimer believes the new strategy "places De Beers and its partners in a stronger position to meet the business and consumer challenges of the future".

De Beers sources it diamonds principally from its own mines in South Africa and from the mines it owns in partnerships with the governments of Botswana and Namibia. It also purchases diamonds from Alrosa in Russia under a trade agreement which extends until the end of next year, and 35% of the run-of-mine production from Ekati in Canada. A proportion has also been purchased until recently under contract from SDM in Angola (a joint venture between state-owned Endiama, Ashton of Australia and Odebrecht of Brazil). Negligible amounts of diamonds are now purchased on the open market. □

Ok Tedi dilemma

The environmental problems facing the Ok Tedi copper-gold mine in Papua New Guinea have been well publicised, the economic implications of closure for the local community less so. Professor Surek Bordia, Head of the Department of Mining Engineering at the University of Technology in Lae, Papua New Guinea, has attempted to redress this imbalance*. The operating company, Ok Tedi Mining Ltd (OTML), is owned 53% by BHP, 17% by Inmet Mining and 30% by the PNG Government, and produces close to 200,000 t/y of copper in concentrates plus about 400,000 oz/y of gold. In 1998, the operation accounted for 20% of PNG's total exports and about 10% of GDP. Export sales in that year were Kn702 million (US$1.00 = kina 2.47) and since 1984 total export sales have been well in excess of Kn6 billion.

There are 81 businesses in the local area employing 1,050 people, with a total turnover in 1998 of Kn80.6 million, and cumulative gross turnovers to that year of Kn625 million. OTML directly employs around 1,860 workers of whom only 163 are expatriates. At the beginning of 1999, there were 80 PNG companies servicing the mine with contracts valued at Kn209 million, and 45 overseas companies with contracts worth Kn35 million. Since 1982 until the end of 1998, Professor Bordia says that some Kn429 million were paid directly to the government in taxes.

Total direct benefits to local communities to the end of 1998, as calculated by the PNG Chamber of Mines and Petroleum, amounted to Kn515 million, and included royalties (Kn82.3 million), landowner compensation (Kn93 million), education and training (Kn22.3 million) and infrastructure development (Kn317 million). It is now some 16 years since the start of production and it has been estimated that in excess of 50,000 people depend on income generated by the mine.

So much for the economic benefits. On the environmental side, the problems arise principally from the fact that tailings are disposed of directly into the Fly River because steep topography precludes construction of a tailings dam. Professor Bordia outlines the options being considered to mitigate the environmental damage: the continuance of trial dredging in the lower Ok Tedi area; to dredge and move tailings by pipeline to a formed storage area; to do neither; to close the mine early. Mine closure has been considered by BHP, and Professor Bordia says that as the pit goes deeper and costs rise the mine will become increasingly marginal as compared with BHP's other assets. Even without the environmental issues, he says, the mine is becoming an economically unattractive asset to manage and operate. (BHP has already paid A$110 million in compensation in an out-of-court settlement with local landowners in 1994, and analysts estimate that early mine closure would necessitate a write-down of A$250 million.)

Since Professor Bordia prepared his analysis, other options have been cited, including the sale of part of BHP's stake to its partners, with the balance placed in trust for local villagers affected by the mine, and the government has said that it has received unsolicited enquiries from two resource companies interested in acquiring BHP's stake (*MJ*, March 24, p.223).

Ok Tedi is located in the rugged Star Mountains of PNG's Western Province and Professor Bordia says that prior to its development the people in the province were living in abject poverty with no access to government services because of their remoteness from Port Moresby. The mine, he says, has brought tremendous economic benefits to the province, especially along the Fly River delta. There is some opposition to mining continuing in the lower Fly River area, and he says that most of the new economic and social studies should be done there to measure the extent of the damage and the economic trade-offs against this damage. On the whole, however, Professor Bordia says that the people of Western Province would like to see the continuation of mining operations. He believes that the Ok Tedi dilemma mirrors real-life conditions everywhere in the developing world (Comment, p.18). □

*'Metals & the Environment-Socio-Economic Dilemma Facing Developing Countries' was presented during the ECOW'99 workshop in Cairns.

Castromil licence refusal confirmed

Dublin-based MinMet plc announced last Friday that the Government of Portugal has refused to grant the company a mining licence for its Castromil gold-silver project, in northern Portugal. MinMet warned last

Mining Centres of the World

JOHANNESBURG

The fourth in the series of *Mining Journal's* special supplements on Mining Centres of the World will feature Johannesburg - the City of Gold - the centre for the huge South African mining industry. Until recently, Johannesburg has been the headquarters of (and is still the key office for) half a dozen of the world's most important mining companies, as well as a large array of associated financial, engineering and manufacturing companies. Most needs of the mining industry can be catered for within the Johannesburg metropolitan area.

Mining Journal will publish the Special Supplement on Johannesburg at the beginning of September 2000 to coincide with this year's Electra Mining Exhibition (one of the southern hemisphere's biggest mining events) being held in the city, and at which the publication will be distributed to visitors. The supplement will cover the whole spectrum of mining and mining-related companies and services located in the area. The supplement will thus follow the pattern of our previous 'Mining Centre' supplements, on London, Denver and Toronto, and will highlight major corporations and organisations. It will include maps locating key companies, details of access by public transport, accommodation etc, making it an invaluable guide for any mining executive visiting the city.

The supplement is being prepared for us by the *African Mining* editorial team in Johannesburg, in conjunction with our own editorial team in London. If you feel that you have relevant material to submit, please contact Paul Crankshaw in Johannesburg on (011) 622 4666 or e-mail: paul@mining.co.za or Chris Hinde in London on +44 20 7216 6060 e-mail: chris.hinde@mining-journal.com

The supplement will be sent as part of the normal subscription to *Mining Journal's* worldwide key mining industry management readership in some 130 countries, as well as to visitors to the Electra Mining exhibition. It will also be available from our exhibit at MINEXPO 2000 in Las Vegas in mid-October.

Advertisements in the supplement are available at normal *Mining Journal* rates. The booking deadline is August 11th with copy required by August 18th at the latest. For details please call Mike Bellenger or Frank Gordon on +44 20 7216 6060; fax: +44 20 7216 6050 or by e-mail to advertising@mining-journal.com In Africa, call Bob Stephen on +27 11 952 1721 or by e-mail to bstephen@iafrica.com

month that the government had expressed environmental concerns during discussion of the details for a final mining licence for the project (*MJ*, June 2, p.434), one of a number which MinMet holds in Portugal through its wholly-owned subsidiary Connary Minerals.

MinMet notes that the government "appears to cite additional environmental concerns and a delay in Connary not providing expert studies on certain aspects of the Castromil mining plan by May 30". The project lies close to residential areas. The company contends that the government's position with regard to the apparent reasons for its denial of the mining licence "has no legal basis".

The expert reports in question were being prepared by Knight Piésold (UK) Ltd for submission this Monday (July 10), covering six areas of the project's plans: pit lining; cyanide management; water management; waste management; environmental management; and mine closure. MinMet notes that Connary had previously advised the Portuguese authorities that a short delay would occur, attributed to the amount of work required, and considers that the government, in the form of the Instituto Geologico e Mineiro, has "moved with indecent haste" to rescind its decision of December 1999 to grant the mining lease.

Although conceding that MinMet's emphasis has shifted to its South American exploration projects in the past year, the company's chief executive, Michael Nolan, has expressed its determination to secure the Castromil mining lease, via the appeal process, or to agree a compensation package from the Portuguese Government. MinMet hopes to begin talks with government officials in Lisbon early next week. □

Navan in transition

Shares in Navan Mining plc, the successor company to Navan Resources plc, began trading this week following the official listing of the company on the London and Dublin stock exchanges. A new UK-incorporated holding company has been established, headquartered in the UK, to acquire the old Navan (*MJ*, May 26, p.419). Navan has made considerable strides since its incorporation in Ireland in 1987. It has grown from an explorer with activities primarily in Ireland to a significant European base and precious metals producer. Ireland is retained in its exploration portfolio but, under a new management team, the main focus is now on gold-copper mining and exploration in Bulgaria, and base metals production and exploration in Spain.

In southern Spain, the company has achieved significant success since its acquisition of the Almagrera mining-milling-acid plant complex from the Spanish Government in 1997 and the development of the new Aguas Tenidas underground mine. This mine, 21 km from Almagrera, is being integrated into the processing operations and will complement the low-grade ore feed from the Sotiel mine. Aguas Tenidas will not reach full production until next year but output is already exceeding expectations.

Last year, Almagrera produced 22,200 t of zinc, 4,100 t of lead and 2,600 t of copper. This year, zinc production should reach 44,000 t, with a further 20% increase scheduled for 2001. In 1999, the 1.0 Mt/y capacity Sotiel mine contributed 410,000 t of ore at a head grade of 4.77% Zn. At the 0.6 Mt/y capacity Aguas Tenidas operation, production totalled 158,400 t of ore at a grade of 7.24% Zn but 60% of production was development ore and the grade should rise accordingly as the proportion of stoping ore increases. Early this year, the first 23,000 t of ore run through the concentrator provided a head grade of 9.1% Zn. Operating costs at the Spanish mines last year (excluding depreciation but including mining, milling, management, administration and services) were US$44.17/t milled. The figure is high and reflects in part the development and trial mode of Aguas Tenidas, but it is considerably lower than the 1998 figure of US$51.27/t, and further improvement is anticipated.

Both Sotiel and Aguas Tenidas are volcanic massive sulphide deposits and at the latter, where proven and probable reserves amount to some 9 Mt, exploration is expected to increase the resource base considerably. A new gold resource has also been established in the hanging wall amounting to some 950,000 t at 1.5 g/t Au, 7.49% Zn, 0.65% Cu, 1.37% Pb and 42 g/t Ag, and consideration is being given to installing a CIL/CIP gold plant at the Almagrera complex. Elsewhere in southern Spain, the company is still considering whether to proceed with the Mazarron polymetallic project near Cartagena.

In Bulgaria, Navan acquired a 68% stake in Chelopech, Europe's largest gold mine, in 1994. It has now increased its effective holding to 92% with the balance of ownership held by the government. The mine and mill have undergone major rehabilitation, and the former practice of room-and-pillar development is being eliminated in preparation for a switch to more efficient, multi-directional sub-level caving. This is expected to reduce development tonnage from 30% of the total mined to 14%. Last year, the Chelopech mine and processing facility treated 612,232 t of ore (1998: 559,072 t), head grades of 1.54% Cu and 4.33 g/t Au were achieved and production amounted to 59,908 oz of gold and 8,143 t of copper. Total silver in concentrates was 70,402 oz. Operating costs (excluding depreciation) totalled US$20.29/t milled (1998: US$21.62/t) and US$19/t is targeted by 2001, by which time ore throughput should have reached 800,000 t/y, copper output 10,800 t/y and gold output 76,200 oz/y. Proven and probable reserves at Chelopech amount to some 5 Mt averaging 3.4 g/t Au and 1.5% Cu. Navan also has its largest exploration portfolio in Bulgaria.

Increased revenues as a result of the development at Aguas Tenidas and the revitalisation of Chelopech enabled Navan to return a trading profit of US$5.8 million in 1999 after a US$2.96 million loss in 1998, and although the retained loss for the year was US$7.37 million this compared with a loss of US$12.46 million in 1998. The company says that arrangements with Deutsche Bank mean that it is now fully financed to complete all its base capital and development plans and it expects to have a profitable business by the end of the year, with a "significant improvement in 2001". □

Zimbabwe gold mines at risk

According to Zimbabwe's Chamber of Mines, the country's gold mines are facing a critical shortage of foreign exchange and 90% are "at risk" if the situation does not improve.

Zimbabwe's 25 mines employ a workforce of 35,000 and last year's production of 27,666 kg accounted for 3.5% of gross domestic product and earned the country 30% of its foreign exchange.

Under Zimbabwean law, gold miners must sell their product to the central Reserve Bank. They are paid in Zimbabwean dollars and the current rate of exchange of Z$38 to one US dollar, which has remained unchanged for the past 18 months, is proving too strong for the industry. One industry executive believes that a devaluation to around Z$50 to the US dollar is required if the industry is to survive. Another source of frustration is that gold producers are not allowed to hold foreign currency accounts – such facilities are restricted to direct exporters, and gold producers do not qualify because they sell their production directly to the Reserve Bank.

Underlining the severity of the situation, Australia-based Delta Gold halted production last month at its Eureka mine because of the low gold price and the economic problems in Zimbabwe (*MJ*, July 7, p.10). The new US$24 million mine was only opened last December. This week, Falcon Gold Zimbabwe Ltd suspended operations at its Venice mine and warned of permanent closure if a "meaningful devaluation of the Zimbabwean dollar does not take place shortly". It said that it might be forced to take similar action at its Dalny and Gold Quarry mines before the end of the year. □

China's approach to coal pollution

Coal represents some 90% of China's primary energy reserves, and in 1998 the total output of 1,220 Mt accounted for 75% of national primary energy production. In terms of equivalent tonnes of oil it consumed around 650 Mt compared with 530 Mt in the US and a world total of about 2,260 Mt. Coal supplies 76% of the fuel requirements for China's power industry, 80% of the commercial energy for householders and 60% of the raw material required for the chemicals sector.

The vast majority of coal produced is consumed domestically, and the main cause of air pollution in China is from coal combustion. The damage to municipal buildings and farm land alone, as a result of air pollution from coal combustion, has an annual estimated economic cost of Yu16 billion (US$1.00 = Yu8.28), and this is without considering the cost to the nation's health.

Because coal is likely to remain China's primary energy source for the foreseeable future, the introduction of clean-coal technology is essential, not only to reduce air pollution but also to make coal utilisation more efficient.

Emphasis on washing

Unlike the situation in the US, Australia and Europe where the focus is on research into advanced combustion systems as a means of tackling air pollution, China has yet to reach that stage. Instead, it is directing its efforts towards developing and improving methods for producing washed coal, and the following article, contributed by Zhou Wei and Li Linqing of the China Coal Preparation Design and Research Institute in Pingdingshan*, outlines the current status of coal preparation in China.

Until recently, less than one quarter of China's total raw coal production, including both coking coal and steam coal, has been washed. The remainder is burned or used without being cleaned. Coal washing, moreover, is concentrated in the coking coal sector, and the main priority over the next few years will be to increase the proportion of steam coal being washed. Coal-washing technology is low cost and its installation requires only modest capital investment compared with other clean-coal technologies. In China, medium- and high-sulphur coals (sulphur content more than 2%) account for 11% of total annual coal production, and in about 65% of such coals the sulphur is contained in pyrites. Mr Zhou says that most of the ash content and 50-70% of the pyrite can be removed by mechanical separation.

At the end of 1997 (the latest comprehensive data), China's major state-owned coal mines possessed 226 coal preparation plants with a total washing capacity of 341 Mt/y. Of these, coking coal washeries numbered 140, with a washing capacity of 187 Mt/y, and steam coal washeries numbered 86, with a capacity of 154 Mt/y. In addition, there were 176 local state-owned coal preparation plants with a total design washing capacity of 49 Mt/y. There are also quite a number of private coal preparation plants, although these are rather small. In 1997, 23% of the raw coal produced in China was cleaned. Of the total volume of coal washed of 318 Mt, the major state-owned coal preparation plants washed 240 Mt.

The average washing capacity of the state-owned plants is 1.4 Mt/y. The biggest

The 4 Mt/y capacity Fanggezhuang coking-coal preparation plant.

coking-coal preparation plant is Fanggezhuang (Beijing), with a capacity of 4.0 Mt/y. The biggest steam-coal preparation plant, Antaibo in Shanxi Province, is far larger, having a capacity of 15 Mt/y. A sister plant with the same capacity, Anjialing, is under construction and completion was expected at the end of 1999.

In the typical Chinese coking-coal preparation plant, there is normally a combined process of jigging plus flotation or heavy-media separation (HMS), with the feed particle size of up to 50 mm. In a typical steam-coal preparation plant, there is normally an HMS system or a jigging circuit, with feed particle sizes of 25-100 mm or 13-100 mm.

The average coal quality of the major state-owned coal mines in 1997 was as follows:

Coal	Ash Content (%)	Moisture Content (%)	Sulphur Content (%)
Raw coal	25.41	–	1.02
Washed saleable coal (coking and steam coal)	20.49	9.17	0.80

The average ash content for all Chinese raw coal is 30% with sulphur content averaging 1.04%. Coking coal is normally washed to an ash content of 9.9% and a sulphur content of 0.67%. Because of the low proportion of raw coal being washed, particularly steam coal, all saleable coal has a higher average ash content.

In order to improve coal quality, China plans to build more coal preparation plants. By the end of this year it is expected that washing capacity will reach 450-500 Mt/y, and that some 350-400 Mt/y of raw coal will be washed, equivalent to around 30% of total coal production compared with the 23% three years ago. Mr Zhou says that, during the ninth Five-year Plan, China will build 223 new plants with total washing capacity of 289 Mt/y, and 100 existing plants will be expanded to raise their capacity to 200 Mt/y.

Future plans

In the longer term there will be a number of aims. It is intended that the next generation of coal-preparation plants to be built will be larger in scale as a greater proportion of raw steam coal will be washed. Plants will also need to be highly efficient and use reliable equipment in order to operate successfully. To this end, new HMS systems will be developed and high efficiency jigs introduced, especially to treat 'difficult' coals. In those coalfields, particularly in the northwest, where the coal is plentiful and of good quality but where there is a lack of water, dry-cleaning methods are considered to have considerable potential.

The development of processes to remove the sulphur content from coal will be a priority. High-sulphur coal is mainly concentrated in the coalfields of southwest and central China, and in the deep seams of northern China. The continued development of these resources over the next decades will necessitate an effective method for sulphur removal.

For fine coal, advanced dewatering equipment will be developed. At present, most coal-preparation plants dewater their washed fine-coal concentrate by means of vacuum filters, and the moisture content of the filter cake, normally around 30%, results in the moisture of the final product being too high.

Finally, Mr Zhou says, there will also be a focus on the development of instrumentation and devices for automatic process control. It is intended that ash and moisture content, solids and liquids flow levels will be measured on line (for both coal and slurry) as a means of improving not only coal quality but also financial returns.

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Exploration

Howards Pass option

Copper Ridge Explorations of Vancouver has announced that it has acquired an option from Placer Dome and a US Steel subsidiary, Cygnus Mines, to purchase a 100% interest in the Howards Pass Zn-Pb-Ag deposit along the Yukon/NWT boundary in northern Canada on which around C$15 million has already been spent. According to the company, the property encompasses one of the largest undeveloped zinc deposits in the world, with a resource estimate calculated by Placer Dome of 110.5 Mt at 7.7% combined zinc and lead (5.3% Zn and 2.4% Pb) at a 4% combined cut-off, plus additional silver and cadmium.

The terms of the purchase include an initial C$10,000 payment and a 150-day period for due diligence. Copper Ridge can then exercise its option by making a C$1 million payment (75% cash, 25% equity units) as a part of a C$10 million total payment over four years. A further C$5 million is payable as a bonus if a decision to move to production results. The option is in the form of a non-binding letter of intent and remains subject to approval by the CDNX exchange and the respective Boards of Directors of Placer Dome and US Steel/Cygnus Mines.

MMAJ success

The Metal Mining Agency of Japan has discovered two gold deposits, some 150 km southeast of Bamako. The deposits cover an area of 0.4 km^2 and the MMAJ has completed 11,600 m of drilling on them, returning gold values of up to 164.7 g/t. The discoveries were made after a three-year exploration programme and further work on the deposits will be undertaken by a private Japanese company, the Overseas Mineral Resources Development Co., a consortium of Japanese mining and metals companies.

The MMAJ made its discoveries during a geological survey that it is undertaking in Mali in conjunction with the Japan International Co-operation Agency and under the auspices of Japan's official development assistance programme.

McIlvenna Bay resource expansion

Foran Mining Corp. has reported the results of a new independently audited resource estimate for its McIlvenna Bay deposit located in the Flin Flon area of northern Saskatchewan, Canada. Total combined indicated and inferred resources for the Lens 2 massive sulphide, the Upper West zone and the Lens 3 massive sulphide areas have been increased by 26% and are now estimated at 14.5 Mt at a grade of 6.08% Zn, 0.91% Cu, 0.4% Pb, 0.45 g/t Au and 23.7 g/t Ag. The latest resource estimate has been audited independently by consulting engineers Watts, Griffis and McOuat of Toronto.

The increase follows the drilling of an additional 14 holes from the winter/spring 2000 infill and expansion drilling programme. The new estimate is based on over 63,000 m of drilling from 124 diamond drill-holes and covers mineralisation from surface to a depth of 1,200 m.

Cracow resource estimate

The Cracow joint venture has reported an inferred resource estimate of 1.1 Mt at a grade of 11 g/t Au and 9.5 g/t Ag within the Royal Shoot in the Klondyke epithermal vein complex in Queensland, Australia. Thus far, no resource estimate has been announced for the zone of mineralisation beneath the old Klondyke workings. The joint venture has applied for a mining lease over the area containing the Royal Shoot and is continuing with the preparation of a prefeasibility study due for completion in August. Meanwhile, exploration continues. Two holes located 400 m and 500 m north of the Royal Shoot have recorded intersections of 4 m at 5.7 g/t Au and 5.5 m at 12 g/t Au respectively. Results are awaited for holes drilled 100 m below these intersections.

Newcrest Mining has an interest of 70% in the joint venture and is conducting the exploration programme. Sedimentary Holdings holds the balance of 30% in the joint venture over the Cracow tenements and retains a 100% interest in the Cracow CIP plant and associated infrastructure located some 2 km to the east of the newly estimated resource.

NDT in Peru

NDT Ventures Ltd of Vancouver has acquired two contiguous mineral concessions totalling 1,600 ha in central Peru. The so-called Coshuros project is located 90 km east of Trujillos and about 10 km southwest of the Tres Cruces gold-silver deposit. The area contains silicified breccias and zones of quartz-vein stockworks hosted by intermediate Tertiary volcanics. NDT reports gold values of up to 7 g/t Au in the vein material and up to 1.9 g/t Au in the breccias. Detailed sampling is to begin shortly.

Mungari East success

The Australian junior, Dioro Exploration NL continues to report promising results from its Mungari East gold project in south-central Western Australia. The company has a 49% interest in a joint venture with Mines and Resources Australia Pty Ltd (51%), part of France's Cogema group. Attention is focused on the Frog's Leg project, where 3,500 m of a 10,200 m reverse-circulation and diamond drilling programme has yet to be drilled. The holes are being angled at 60º and better results to date from the RC drilling, all from separate holes, include: 28 m at 2.93 g/t Au at a depth of 50 m; 16 m at 7.56 g/t Au from 108 m; 7 m at 11.85 g/t Au from 190 m; and 4 m at 12.17 g/t Au from 179 m. The more significant diamond drilling results include a 5 m intersection at 34 g/t Au from 40 m, including 152 g/t over a 1.0 m interval.

Dioro recently announced plans to raise up to A$5.96 million through a rights issue in order to fund its Mungari East project (*MJ*, July 7, p.16).

Audit results for Aredor's K23

Trivalence Mining Corp. has received the results of an audit on its bulk sampling programme on the K23 kimberlite within the Aredor concession. The company has extracted a 12,065 t bulk sample over the past few months and an audit of the sampling programme by MPH Consulting South Africa (Pty) Ltd indicates that the kimberlite has an average grade of 0.4 ct/t (based on wet tonnes of kimberlite). Another MPH estimate assumes a moisture content of 30%, and a 30% increase in diamond grade to compensate for the loss of small stones (less than 2 mm). On this basis the grade of the sample is 0.7 ct/t.

Trivalence says that Guinea's Bureau National d'Expertise valued the 161.73 ct of gem-quality diamonds recovered from the sample at US$181.39/ct, and the 319.57 ct of industrial diamonds and boart at US$29.32/ct.

As a result of the positive audit and the subsequent sale prices of the diamonds recovered by the sampling programme, Trivalence will undertake a 2,000 m diamond drilling programme to test the K23 kimberlite at depth and more clearly define its shape and phases present.

Trivalence has also reported higher production from Aredor (this issue, p.28).

Development

Nalunaq on schedule

Crew Development Corp. of Canada reports that test mining is on schedule at the Nalunaq gold project in southern Greenland where it is in joint venture with NunaMinerals A/S. Crew is earning a 67% interest in the project and is the operator. The partners are committed to spending C$7 million on a development programme preparatory to completing a final feasibility study and securing project financing with the object of bringing a mine into production early in 2002. Crew reports that visible gold has been identified in each of the three new raises, and that the existing adit (in excess of 400 m in length) is being extended into the gold-bearing structure.

Discovered in 1993, Nalunaq is located within 6 km of an ice-free deepwater fjord, and 40 km from existing port facilities at Nanortalik. The Main Vein outcrops at surface and has been mapped over a strike distance of 2,000 m. It occurs in metavolcanics within the Ketilidian mobile belt. Underground operations involve drilling and blasting in three parallel adits, and simultaneously in raises. Ultimately, three adits, plus eight to ten raises connecting the adits at 80 m intervals, will be completed. At present, in excess of 300 t/d of mineralised material is being treated. In addition, geologists are collecting more than 50 channel samples per day and Strathcona Mineral Services is supervising a grade-verification programme. Test mining will continue until September, by which time a total of 20,000 t of material should be recovered.

A positive prefeasibility study completed in March 1999 (*MJ*, April 2, 1999, p.242) estimated an indicated and inferred resource of 425,000 oz at a grade of 32 g/t Au at Nalunaq within a geological resource of 1.8 Moz.

Mindoro feasibility study under way

Meanwhile elsewhere, Crew has announced the commencement of a bankable feasibility study for its wholly-owned Mindoro lateritic nickel project in the Philippines. The study will be undertaken by Kvaerner Philippines Construction Inc., the same company which completed the prefeasibility study in August 1998. International Mining Consultants has been contracted to make an independent assessment of the resource estimate, and Coffey Philippines International will carry out the geotechnical evaluation of the minesite, overland ore-slurry pipeline and refinery sites. URS will design the overland slurry pipeline and the tailings disposal pipeline.

The Mindoro deposit is located on Mindoro Island, approximately 200 km south of Manila. Measured and indicated resources total 72.6 Mt (dry) with an average *in situ* grade of 0.94% nickel and 0.06% cobalt, including 21.4 Mt (dry) at 1.16% nickel and 0.06% cobalt. According to Crew, a significant portion of the higher-grade resource has up to 60% low-grade bedrock material, and its removal during de-agglomeration of the ore should cause a considerable increase in the head grade. Mined ore would be pumped 40 km by slurry pipeline to the refinery at Pili Point on the coast. The high-pressure acid leach process to be used will be designed to produce approximately

40,000 t of nickel briquettes and 3,000 t of cobalt briquettes annually. By-product output would include 126,000 t/y fertiliser-grade ammonium sulphate, representing about 30% of the Philippines' annual consumption.

Snap Lake scoping study

Winspear Diamonds Inc., the target of a hostile takeover bid by De Beers (*MJ*, June 30, p.497), has now released the results of its July 2000 scoping study for the Snap Lake project. The study, prepared by MRDI Canada (a division of AGRA Simons Ltd), estimates the mineable tonnage of kimberlite at 39.5 Mt at an average diluted mine grade of 1.7 ct/t which would yield some 67 Mct of diamonds. This is considerably higher than the prefeasibility study estimate of 12.6 Mt at a diluted mine grade of 1.75 ct/t and an estimated recovery of 22 Mct. The average value for the Snap Lake diamonds is C$171/ct (US$118). The proportion of mineable tonnage from that portion of the kimberlite dyke in excess of 2 m in thickness is estimated at 27.6 Mt

The scoping study envisages mining to a depth of about 750 m with ore hoisted via a vertical shaft starting in 2006. A two-stage development is contemplated, with initial daily ore throughput reaching 3,000 t by the end of 2003. In a second stage, which would see the development of a second access-shaft on the north shore of Snap Lake, throughput would rise to 6,000 t/d. Mine life is expected to be more than 20 years. Capital costs are estimated at C$289 million initially, and a further C$230 million for the second phase expansion would be funded from project cash flow. Overall operating costs are estimated at C$88/t. Winspear's chief executive, Randy Turner, says that the company is excited by the results and is moving ahead to prepare a bankable feasibility study.

Finlayson study

Expatriate Resources reports that it has completed the initial stage of process metallurgy and concentrate marketing for its Finlayson Project in Canada's Yukon. The company says that the results of locked-cycle flotation and concentrate roasting, and of initial discussions with interested smelters, have exceeded the expectations from the Wolverine scoping study compiled earlier this year. The project combines development of the recently acquired Kudz Ze Kayah deposit and the Wolverine deposit, the latter owned by the Wolverine joint venture (60% Expatriate and 40% Atna Resources). The results from the locked-cycle flotation testing have confirmed that ores from Kudz Ze Kayah and Wolverine can be combined resulting in improvements over results previously attained from Wolverine alone.

Based on a mill-feed ratio of 3,000 t/d from Kudz Ze Kayah and 1,250 t/d from Wolverine, the combined operation has been assessed to be able to produce, on an average annual basis, the concentrates detailed in the table below.

Recoveries achievable to final concentrate are Zn – 91%, lead – 64%, Cu – 81%. Silver recovery is 85% and gold 73%.

The prefeasibility study currently in progress is on schedule for completion late this year.

Flotation product	Tonnes	Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	Au (g/t)
Copper concentrate	40,300	2.5	1.8	25	4,350	16
Lead concentrate	32,600	6.2	55	1.4	2,000	35
Zinc concentrate	201,700	55	1.5	0.3	120	0.8

Iranian alumina plant delay

Development of a 280,000 t/y alumina refinery in the Khorasan Province of northeastern Iran has been interrupted by questions regarding the plant's design. The contract to establish the refinery is held by Technoexport of the Czech Republic, which took over the project from another Czech company awarded the contract in the early 1990s.

According to Reuters, the Iranian authorities have already spent around US$400 million on the project (including US$260 million in foreign currency), which was originally scheduled to be commissioned last September. The Iranian side of the project is managed by Amid Engineering and Development, a private Iranian company. Discussions are reported to be under way in Tehran between Technoexport and the Iranian side regarding re-establishing a schedule for the project.

The alumina refinery, located in the Jajarm area, 570 km northeast of Tehran, is designed to supply Iranian aluminium smelters, replacing imported alumina. The Jajarm area is rich in bauxite, and the plant lies close to a mine with reported proven bauxite reserves of 19.2 Mt.

Aquarius confirms Everest addition

Aquarius Platinum Ltd, registered in Bermuda, has agreed to acquire the Everest South, Chieftains Plain and a portion of the Everest North platinum group metal (PGM) properties from Impala Platinum Holdings Ltd, in exchange for a 25.5% interest in Aquarius' wholly-owned subsidiary, Aquarius Platinum (South Africa) Pty Ltd. The latter company owns the Marikana PGM project, where a feasibility study has already been completed. Aquarius plans to commission an 80,000 oz/y (Pt) mining and concentrating operation at Marikana by mid-to-late 2001.

The deal, confirming discussions revealed last month (*MJ*, June 9, p.458), effectively allows Impala to outsource development of three of its smaller project to Aquarius, whilst retaining the rights to treat the concentrates produced. Marikana was already subject to an agreement whereby Impala would treat the output (*MJ*, June 23, p.487), and Impala would thus hold interests in each of these potential sources of smelter feed. Impala also holds a 17.2% shareholding in Aquarius Platinum Ltd itself, which is listed in Australia and on London's Alternative Investment Market.

The immediate focus of the projects to be acquired is Everest South, where Impala has already completed 57 drill-holes with 100 deflections to establish an unclassified resource estimated at 34.7 Mt of UG2 reef, at a grade of 4.0 g/t combined PGM. The reef under the property runs from surface to a depth of 250 m. Aquarius plans to conduct a feasibility study of Everest South whilst Marikana is under construction, with a view to possible production at Everest South commencing in mid-to-late 2002. Such production would raise the production of Aquarius Platinum (South Africa) to 300,000 oz/y of combined PGM.

Everest North and Chieftains Plain lie 12 km due north and due west of Everest South respectively. These properties have not been explored in detail, but Aquarius believes that Chieftains Plain "has the potential" to host at least 70 Mt of Merensky reef and 90 Mt of UG2, and that the mineralisation could be "significant ... especially at current metal prices".

BHP sells White Pine

Broken Hill Proprietary Co. Ltd of Australia has sold its White Pine copper refinery in Michigan to Considar Inc., a wholly-owned subsidiary of the Arbed steel group, for an undisclosed sum. The disposal follows the closure of BHP's US copper mines a year ago (*MJ*, July 2, 1999, p.2), which remain on care and maintenance. White Pine was not immediately affected by the closures because it was operating largely independently of BHP's mines. However, BHP's relatively new management team has been reviewing the group's worldwide asset base.

BHP's director of external affairs in the US, Chuck Taylor, told Reuters that the sale was not material (in terms of its financial impact) to the wider group. The refinery has a capacity of 68,000 t/y, but is producing only "minor amounts of copper cathode during the transition period", according to Mr Taylor. Considar plans to use White Pine to refine copper anodes purchased from Considar Metal Marketing, a joint venture with Hudson Bay Mining and Smelting of Flin Flon, Canada, part of Anglo American plc.

Pirdop plant upgrade

Union Minière's Bulgarian subsidiary, Union Minière Pirdop Copper (UMPC), has signed an agreement with Lurgi Metallurgie of Germany for the upgrading of its Pirdop Copper plant in compliance with European environmental standards. The contract calls for the upgrade to be completed within 24 months. This is the final stage in UMPC's ongoing investment programme at Pirdop which will achieve an annual production of 185,000 t/y of copper anode and 45,000 t/y of LME-grade copper cathodes.

The contract with Lurgi includes the supply and service of the following equipment: new steam-heated dryers with dust-control system; upgrading of the existing dry electrostatic precipitators; new primary and secondary hoods at the converters; upgrading of the existing wet gas-cleaning system; and upgrading and capacity increase of the sulphuric acid plants. The Lurgi contract falls within Union Minière's overall investment plan for an additional US$109 million for environmental and plant modernisation projects in Pirdop.

The investment plan also covers a new tailings pond, upgrading of slag flotation facilities, upgrading of water-cooling systems and enhanced energy efficiency. The completion of the programme will result in the decrease of gas and dust emissions into the environment by up to 15 times compared with the levels at the time of UM's acquisition of the plant.

Production

Freeport sales below expectations

Freeport-McMoRan Copper and Gold Inc. has said that copper sales in the June quarter of this year stood at 256 Mlb, compared with forecast sales of 320 Mlb. The company has attributed the shortfall to a number of factors, including delayed shipments caused by bad weather and sea conditions, and changes in the sequence of mining material and lower ore throughput rates at its Grasberg mine in Indonesia.

Following a landslip into the mine's overburden dump, the mine has started on a programme to move 8 Mt of overburden in a bid to stabilise the dump. As part of this plan, Freeport's operating subsidiary has been forced to reduce production at its open pit to 200,000 t/d. To compensate for this, the mine has added 20,000 t/d of production from its underground operation which is under

development. This has enabled the mine to maintain mill throughput at around 220,000 t/d compared with the originally budgeted 230,000 t/d.

Esmeralda suits

The Hungarian Government said this week that it plans to sue the owners of the Baia Marie gold operation in Romania for US$110 million in damages. The operation, which is owned by the Romanian Government and the Australian company, Esmeralda Exploration Ltd, was blamed for causing widespread pollution in the Tisza and Danube rivers after a tailings dam overflowed (*MJ*, March 24, p.230).

The mine, which reopened last month, is also to be sued by Yugoslavia. According to *Tanjug Belgrade*, the country's public attorney, Milos Bojovic, has submitted a claim for US$2 million in damages as compensation for the impact of the spill on the Danube in Yugoslav territory.

Codemin maintains output . . .

Mineraçao Codemin, the Brazilian nickel producer owned 90% by Anglo American plc, should produce around 7,000 t of nickel contained in ferro-nickel this year according to Ruy Fischer, a director of the company. This is at a similar level to 1999 output. According to Mr Fischer, Codemin plans to maintain current production levels while investing in other projects such as the Barro Alto nickel deposit in Goias State, Brazil, and the Loma de Niquel mine in Venezuela. At Barro Alto, contained nickel reserves are estimated at 72,000 t and feasibility studies are in progress. At Loma de Niquel, production this year is forecast at 18,000 t. The company currently has no plans to reopen the Morro de Niquel operation shut down in 1998.

. . . SLN increase anticipated

According to Yves Rambaud, chairman and chief executive of parent company Eramet, Société Le Nickel's nickel production should reach 62,000 t in 2001, up from an anticipated 57,000 t this year (a reduction from the initial target owing to labour problems in February and March). Next year, depending on the results of an ongoing feasibility study, SLN is due to make a decision on whether to increase its New Caledonian nickel production to 70,000-72,000 t/y by 2004 or 2005.

Witkrans success

Caussa Capital Corp. has recovered a 5.4 ct gem quality diamond in the course of trial mining at its alluvial diamond property at Witkrans, 120 km west of Johannesburg in South Africa's Ventersdorp district. To date, 173 diamonds have been recovered with a combined weight of 133.18 ct. Approximately 17% exceed 1.0 ct. Toronto-based Caussa reports that it has received C$215,000 from the sale of surplus mining equipment and that the proceeds are being used to supplement working capital.

Labour contract agreed

Workers at Canada's second largest aluminium smelter at Becancour in Quebec have overwhelmingly endorsed a new labour contract according to a spokeswoman for Aluminerie de Becancour (owned 75% by Alcoa and 25% by Pechiney). The old labour contract expired at the end of June.

Power and labour problems hit Zincor

Power outages and labour problems within its 680-strong workforce are expected to cause Zinc Corp. of South Africa Ltd's output to fall to its lowest level in four years, according to a company spokesman. Zincor estimates production of 103,000 t of zinc metal this financial year (ended June 30), as against 110,000 t last year. However, the company forecasts production increasing to 113,000 t during the new financial year, and intends to raise output to 125,000 t by 2004. Zincor is now controlled by Iscor which acquired a 65% stake earlier this year from Gold Fields of South Africa.

Jinchuan fire

China's largest nickel producer, Jinchuan Nonferrous Metal Co. (JNMC), has reported that a fire at a nickel mine in Jinchang city in Gansu Province, northwest China, has killed 17 people. The fire broke out in a transport tunnel and the miners were suffocated. The cause of the fire is being investigated.

The fire has been put out and operations are described as nearly back to normal. Last year JNMC produced 40,000 t of nickel and expects to exceed this tonnage in 2000. Annual maintenance is scheduled to begin shortly but this will be in rotation, one furnace at a time, so as not to affect overall output.

Bronzewing resumes milling

Milling has resumed at the Bronzewing mine in Western Australia, although the mine itself remains closed following the recent mudrush (*MJ*, July 7, p.10). Search operations have continued for the three missing miners feared dead in the mine according to a spokesman for mine operator Normandy Mining. The mill is treating stockpiled ore from Bronzewing and ore from Normandy's nearby Mt McClure operation. Mining will not resume until the state government and the state coroner, who are investigating the accident, have given their approval. Normandy does not know when this will be.

Harzer to close

Metaleurop is to close the zinc metal production plant at its Harzer Zink facility at Harlingerode in Germany as it is unable to produce metal competitively. The plant has an annual production capacity of 20,000 t/y and supplies its own zinc oxide operation, also in Harlingerode. This latter operation will continue, but will now buy its zinc metal on the open market.

Harzer uses a vertical retort process which has proved unable to meet the desired level of profitability and cannot comply with new environmental legislation without heavy new investment. Metaleurop says the plant made a €3 million negative contribution to its results last year.

Aredor production and sales rise

Trivalence Mining Corp. reports that its 85%-owned Aredor operation in Guinea (*MJ* Guinea Supplement, March 2000, p.9) achieved a 63% increase in diamond output during the financial year to June 30. Production reached 40,802 ct and sales revenues rose by 88% to US$15.27 million. The company attributes the increase to improvements in the diamond recovery process at the mine and plant. March quarter net income has been restated at $1.03 million compared with a loss of $855,717 for the same period in 1999. Trivalence also reports that at its most recent diamond sale held in Conakry on June 27 it sold 4,276.3 ct for $2.62 million, including $1.32 million for a 25.73 ct pink diamond.

Trivalance has also reported on bulk sampling work (this issue, p.26).

Mexican silver lift

April silver production in Mexico, the world's top producer, was 234,647 kg, up by 5% on April 1999, according to the country's national statistics institute INEGI. Overall Mexican mining output in April was 4.5% up on a year ago in real terms. In the 12 months to April, silver production totalled 832,958 kg – 8.4% more than in the same period in 1999. Gold production rose 8.5% in April, but was still down 11.6% year-on-year. Copper output was 21% higher, zinc output fell by 20% and lead production was slightly higher.

Prosecutor General demands more money from Norilsk

In the latest twist in the investigation of the privatisation of Norilsk Nickel (*MJ*, July 7, p.4), Russia's Prosecutor General claims that Interros, the company that controls Norilsk Nickel through its holding in Uneximbank, underpaid the Russian Government by US$140 million when it acquired the complex in the mid-1990s. According to Reuters, the Deputy Prosecutor General, Yuri Biriukov, sent a letter to Vladimir Potanin, head of Interros, saying that if the group voluntarily repaid the US$140 million, no further legal action would be taken. In an open response published in *Kommersant* business daily, Mr Potanin demanded an open investigation of the case in accordance with Russia's civil law.

Strike mandate at Sudbury

Over 97% of union members at Falconbridge's Sudbury nickel operations have voted in favour of giving their representatives a strike mandate. Tom Dattilo, a spokesman for the Canadian Auto Workers Union which represents the workers, said that over a four-day period, 85% of the unionised work force voted. As a result of the mandate, if no agreement between the union and Falconbridge is reached by August 1, the workers will go on strike.

Mr Dattilo said that union and management representatives are meeting on a daily basis to discuss a number of issues regarding a new labour contract, including contracting out work, wages, pensions and job security. He said that the CAW had no plans to accept a similar agreement to that agreed by Inco and the United Steelworkers of America union at its Sudbury operations, adding that he "wasn't too impressed with the Inco agreement."

Three years ago, when the previous labour contract expired, union members went on a 26-day strike before the current contract was agreed upon.

High power-costs bite again

The high power-costs caused by electricity shortages in the western US (*MJ*, June 30, p. 499) have claimed another victim, the Continental copper and molybdenum mine in Butte, Montana. The mine is a joint venture between Montana Resources (50.1%) and Asarco Inc., a unit of Grupo Mexico, and produces around 40,000 t/y of copper and 10 Mlb/y of molybdenum. Montana Resources said that the closure is temporary and that the mine will reopen when its management can secure power rates that will enable it to operate profitably. According to a Montana Resources spokesman, electricity is the single largest cost at the operation.

Whereas the mine's closure has minimal significance for the copper market, it has the potential to be significant for the molybdenum market as its output is equivalent to around 3% of annual global production.

Mintek magnesium project

At present, magnesium metal is produced via two processes. The thermal method operates at temperatures of over 1,200°C and uses a metallothermic reduction reaction in which silicon and/or aluminium extract magnesium as a vapour from the oxide. The other process is based on fused salt electrolysis of anhydrous magnesium chloride.

The thermal process offers several advantages over the chloride process in that the main feedstock is dolomite which requires only calcining, unlike the electrolytic route which requires complex purification to produce anhydrous magnesium chloride feed. The reducing agent in the thermal process, ferrosilicon (or ferrosilicon-aluminium), can be cost-effectively produced using a standard submerged arc furnace utilising much of the plant infrastructure at the magnesium plant. However, the reducing agents are relatively costly and the furnaces operate under a vacuum, necessitating batch operation which lowers productivity.

South African research organisation Mintek believes that the thermal process can be improved. In conjunction with Anglo American, South African electricity producer Eskom and the South African Department of Arts, Culture, Science and Technology, Mintek has decided to build a pilot plant to test its thermal magnesium process (MTMP), developed as a result of work in the 1980s and 1990s. The process utilises a dc open arc furnace and condenser which, Mintek says, is far less capital intensive than the conventional electrolytic process route for magnesium. It also reduces the operating costs of the thermal route. Mintek believes that it could become the most cost effective method of magnesium production.

The pilot plant is currently in the design phase and testwork will be started between November 2000 and April 2001. Mintek says the furnace of the test plant will be designed to operate at between 0.5 and 1.5 MW and a condenser will be rated at 50-100 kg/h of magnesium metal. According to Mintek, this setup will enable the design of a commercial operation comprising one or more furnaces producing 1-2 t/h of magnesium. Three to four such furnaces would be required to produce around 50,000 t/y of magnesium, which is less than half the number of ac furnaces required by a conventional thermal plant of similar capacity.

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CANMET investigates narrow vein mining

The Canadian Government is funding a project by CANMET investigating ways of improving the efficiency of narrow-vein mining. The three-year study was initiated in September 1999 and is being undertaken by a research team including specialists in mining engineering, mechanical engineering and electronic/computer engineering. The study team is based at CANMET's experimental mine near Val d'Or in Quebec, and it has already visited 16 mines in three provinces. At each mine the operation is studied and added to a database of techniques and equipment used in narrow-vein mining. The study team will then use the information to determine the operator's needs in the mechanisation and automation of mine methods and equipment.

The project has already produced several ideas that may lead to specific research projects. These include new mining sequences, equipment and non-explosive rock-breaking. The ideas will be made available on a website to encourage the exchange of information between interested parties.

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PROFILE system from Leica

Leica Geosystems has introduced its new tunnel surveying system the TMS Profile. According to the company, the system has a variety of applications in 2D or 3D measuring modes, including cover tunnel excavation control, wriggle surveys, shaft sinking, tunnel refurbishment, clearance control and non-destructive control of concrete layer thicknesses including volumes.

The system is the result of a joint development between Leica and Swiss-based Amberg Measuring Technique Ltd. It is based on the Leica TPS1100 TCRM, a compact total station which features reflectorless electronic distance measurement technology. The on-board TMS PROscan software offers users a selection of six different 2D or 3D measurement modes and a variety of parameter pre-settings. These features enable users to make manual or automated measurements to any target surface from ranges of 1.5 m to 50 m. The TMS PROwin 7.0 software is Windows 95/98/NT compliant and allows users to undertake practice-orientated data analysis. It also provides computation functions to enable the calculation of cross-sections, areas, over and under-break and volumes. The system can export data in a variety of file formats for use in CAD systems.

Amberg Measuring Technique Ltd, Trockenlostrasse 21, PO Box 27, 8105 Regensdorf-Watt, Switzerland. Tel: (+41 1) 870 9222. Fax: 870 0618. Website: info@amberg.ch

MineMarket launched

Enterprise software specialist Mincom Ltd has launched its new MineMarket product. According to Nick Beaton, senior vice president of the company's mining, oil and gas unit, the software is unique in that it offers an e-commerce-enabled solution providing "unprecedented management and transparency of the total mineral processing supply chain from bedrock to boardroom". Mincom says that the software integrates all aspects of mining and mineral processing and includes attaching a value to a quantity of metal or coal throughout the whole production and logistic process which, it believes, will improve users' responsiveness to the market.

MineMarket covers two broad functions: it models and monitors mining, crushing, processing and beneficiation; and enables mass balancing and metal balancing. It also enables the reconciliation of data from weightmeters, stockpiles and orepasses to processed and measured amounts. The system can place values on metal or coal content from the start and transfer the value to the balance sheet. The second main function enables the sale of product at any stage in the mining, processing and shipments process on the basis of long-term or spot contracts. The software has the capability to record and categorise contracts, plan sales, create invoices and pass them on to accounts receivable, assay and quality tracing and management, and maintain a marketing database. MineMarket will also optimise shipping and logistics channels, says Mincom. MineMarket is a key element of Mincom's Enterprise Management Solution (EMS) which also includes components for supply chain and quality management and sales and shipping components.

Mincom Ltd. Website: www.mincom.com

OTR treads new ground

OTR Tyres Ltd says that the use of its Earthscan unit at the company's headquarters in Alfreton in the UK has generated international interest following a recent presentation at the Tyre Association of North America conference. The Earthscan unit is the only one of its kind in the world and uses ultrasonic examination techniques to scan a tyre's casing for defects and assess its condition for repair or retreading.

According to OTR, the unit enables it to overcome many of the prejudices concerning the quality of retread tyres, and it believes that establishing the integrity of tyre casings, coupled with the lower running costs per hour of retread tyres, should improve customer confidence in retread tyres.

OTR Ltd, Bluebell Close, Clover Nook Industrial Park, Alfreton, DE55 4RD, UK. Tel: (+44 1773) 520 885. Fax: 520 882. E-mail: earthmover@otr-tyres.co.uk Website: www.otr-tyres.co.uk

Clough wins CSA contract

Australian mining and construction company, Clough Engineering Ltd, has been awarded a five-year contract to co-manage the CSA copper mine at Cobar in New South Wales. Clough will manage the operation in conjunction with the mine operator/manager Cobar Management Pty Ltd. The contract will include underground development and ore production and follows Clough's four-month contract at the mine last year when it carried out preliminary development work.

Under the terms of the new contract Clough will use tele-remote loaders to mine some 2.8 Mt of material. It will develop over 9 km of underground road ways and install all ground support, mine infrastructure and associated services.

Rob Jewkes, Managing Director, Clough Engineering Ltd, 6th Floor, 251 St Georges Terrace, Perth, WA 6000, Australia. Tel: (+61 8) 9281 9281. Fax: 9481 6699. Website: www.clough.com.au

Gold slips after auction

The fourth of July celebrations in the US, a net long position on Comex, a stronger US dollar and a weaker oil price were not the only factors behind gold's slip from last week's high of almost US$290/oz. The other contributing factor was this week's Bank of England gold auction.

The London morning gold fix immediately before the auction this Wednesday was US$282.85/oz. The auction price, however, was US$279.75/oz and the 25 t of gold that were on offer were oversubscribed by just 1.3 times, the lowest level of interest since the auctions started last year. According to Kevin Crisp, precious metals analysts with Credit Suisse First Boston, the level of interest in the auctions has been in decline throughout 2000, but it had been hoped that the bottom had been set in the last auction which was 2.7 times oversubscribed. Mr Crisp said that the latest auction reflects the quiet and thin state of the current gold market, but he hopes that by the time of the next auction (on September 19), the market will be a little more robust.

As expected, the World Gold Council (WGC) maintained its condemnation of the auction process, saying that the process is losing British taxpayers money and giving away a cornerstone of British economic sovereignty. The WGC urges the UK Government to abandon the gold sales but if it chooses not to do so, it says that it should at least change the method of the sales, to using either the London gold fix or the Bank of International Settlements mechanism. The latter is used by the Swiss Government to reduce its gold holdings.

In the wake of the auction result the afternoon gold fix in London was US$279.95/oz. Where the price will go from here is difficult to say. Traders warned that a number of funds are holding long positions which may be liquidated should the price fall below US$278/oz. □

Copper boosted

On the London Metal Exchange the three-month copper price, after dipping lower at the end of last week, has managed to breach US$1,800/t aided by two pieces of positive news. In its July report, the Lisbon-based International Copper Study Group (ICSG) announced that the refined copper market had a 46,000 t deficit in April compared with a surplus of 5,000 t in March. The deficit is the first recorded by the ICSG since mid-1996 and comes as a result of strong growth in consumption. This rose by 6.4% in the first four months of the year compared with the same period in 1999. Production during the same period rose by only 3.4%. The ICSG says that "all five continents have experienced positive consumption growth, with Europe and Asia contributing most". The ICSG notes that at the end of June refined stocks of copper on the LME, Comex and Shanghai metal exchanges stood at 696,524 t compared with 742,840 t at the end of May. The other spur to the copper price was the announcement by Freeport-McMoRan that sales of copper were lower than forecast (this issue, p.27).

After breaching US$1,800/t the copper price fell back slightly and Barclays Capital's metals analyst, Kevin Norrish, says that the price will have to breach US$1,820/t to break out of its recent trading range convincingly.

Nickel continues to maintain its wide cash to three-months backwardation. Although fundamental tightness is a major factor behind the backwardation, rumours are rife that long position holders are trying to squeeze a fund that is holding a 10,000 t short position. Traders note that, despite the apparent tightness of the market as evidenced by the cash to three-months backwardation, cash to next week's July date is trading at a US$6/t contango pointing to reasonable liquidity in the market. □

Base metals survey

This week Reuters announced the findings of its bi-annual survey of base metal price forecasts. The survey of 28 analysts from a variety of banks, brokers and independent research companies is encouraging. The tables set out the average price forecasts in US cents/lb for 2000 and 2001.

2000

	Aluminium	Copper	Lead	Nickel	Tin	Zinc
Mean	72.6	83.1	20.5	404.8	254.4	53.0
High	75.6	90.0	22.1	469.5	269.0	56.0
Low	69.0	80.0	19.3	359.0	240.0	51.0
Year to date	70.7	80.1	19.8	425.2	251.6	51.4

2001

	Aluminium	Copper	Lead	Nickel	Tin	Zinc
Mean	75.9	89.2	21.9	367.8	259.5	53.7
High	90.0	100.0	27.0	544.3	318.0	62.0
Low	66.0	75.0	18.6	299.5	230.0	48.0

All metals with the exception of nickel are forecast to move higher, with most analysts pointing to a continued expansion in the US economy and more robust demand from Europe, Japan and China as reasons behind their optimistic outlooks. Aluminium is viewed as the metal with the best fundamental outlook, with smelter cutbacks in the US caused by high power costs having the potential to continue into next year. The forecast for copper is also promising, with strong demand from China particularly significant. Analysts are forecasting deficits for virtually all of the base metals this year and the supply shortfalls may well continue into 2001.

However, despite the positive forecasts, current prices are subdued. There appears to be an element of nervousness about the future of the global economy which has been reflected by a reluctance of consumers to raise their stock levels in line with their order books. A number of analysts warn of potential pitfalls for metal prices. HSBC believes that the consensus view is overly optimistic and feels that in 2001, base metal prices are likely to be lower than current levels. It points to the key role that the momentum of economic growth has on metal prices. Historically, says HSBC, when economic growth has slowed, metal prices have fallen.

The optimists believe that monetary authorities in the US and elsewhere in the world will be able to slow global growth to the extent that inflationary pressure will abate and growth in industrial production will be around 3.5-4%. This, they say, will keep metal markets in deficit and maintain upward pressure on prices. However, HSBC argues that this would imply a slowdown in

LME PRICES & STOCKS

Prices (a.m.) Tonne basis	July 13 Buyers	July 13 Sellers	July 6 Buyers	July 6 Sellers
COPPER *Grade A*				
Cash	$1,785	$1,786	$1,763	$1,763.5
Three months	$1,810	$1,811	$1,785	$1786
TIN				
Cash	$5,445	$5,450	$5,445	$5,455
Three months	$5,485	$5,490	$5,480	$5,485
LEAD				
Cash	$433	$434	$433	$434
Three months	$463	$464	$448	$448.5
ZINC *Special high grade*				
Cash	$1,129.5	$1,130	$1,127.5	$1,128.5
Three months	$1,136	$1,137	$1,144	$1,144.5
ALUMINIUM *Higher grade*				
Cash	$1,572.5	$1,573.5	$1,560	$1,560.5
Three months	$1,567	$1,568	$1,583	$1,584
Alloy				
Cash	$1,224	$1,227	$1,225	$1,230
Three months	$1,268	$1,270	$1,268	$1,273
NICKEL				
Cash	$8,365	$8,370	$8,380	$8,390
Three months	$8,220	$8,230	$8,140	$8,150
SILVER				
Cash	$4.95	$5.00	$4.95	$5.00
Three months	$5.00	$5.05	$4.00	$5.05

LME warehouse stocks on July 12

	Stocks (t)	Stocks (July 5)
COPPER *Grade A cathodes*	528,650	543,300
TIN	11,220	10,610
LEAD	169,950	178,075
ZINC *SHG*	216,600	221,475
ALUMINIUM *HG*	494,075	508,125
Alloy	94,700	94,940
NICKEL	17,346	18,870
SILVER	–	–

economic growth from current levels of around 6%, to 1% by next summer, and that this slowdown would serve to push metal prices lower. □

LME revises proposals

After receiving members' comments on the London Metal Exchange's proposed restructuring (*MJ*, June 16, p.461), the exchange's board of directors have decided to issue a document setting slightly modified proposals for the restructuring. The document will also explain the reasoning behind the modifications and changes and the LME plans to hold an extraordinary general meeting (EGM) in the second week of September. The EGM had been originally scheduled for July 27, but the LME says the revised schedule will enable the exchange to achieve its twin objectives of remaining transparent and allowing its members sufficient time to contemplate the proposed changes. □

Antimony climbs higher

At long last, some activity returned to the minor metals market during June but only for a few of the metals. The hope is, however, that the increased activity will spread to all of the metals.

Antimony led the charge, with prices reaching US$1,500/t by early July. There appeared to be little fundamental reason behind the sharp advance and it is claimed that the increase is being orchestrated by certain traders who are reporting exaggerated sales prices which are encouraging published quotations to be increased. This, in turn, encouraged the Chinese to increase their offers, allowing traders to follow up with further bids just below the market to support it. This cycle is said to have continued throughout the month. As a result, other traders are concerned that Chinese sales agreed at previously lower levels around US$1,100/t will not be shipped – as it is normal practice with many Chinese suppliers to renege on contracts when markets move up. This, along with the Chinese now claiming restrictions on exports, could lead to even further price increases. However, although last year official export licences were issued to cover only 40,000 t, around 85,000 t were exported. Whether the pattern is repeated this year will depend on how much metal is smuggled out of China; smuggling is reportedly at lower levels than in recent years.

Bismuth prices continued to subside, with regular offerings from China as low as US$3.10/lb. There is strong speculation, however, that some Western producers are encouraging these lower prices whilst they renegotiate long-term purchases from the Chinese, as the lower prices will encourage the Chinese to look at larger discounts. It is generally expected that prices will pick up later in the year.

Cadmium got caught up in the excitement, with sales as high as US$0.30/lb reported for higher-grade sticks (min 99.99%Cd). This increased activity was initially created by buying interest from China amid reports that the Huludao zinc smelter was to reduce its cadmium output by about 70% as a result of mechanical problems at one of its production units. The market response was surprising, given that the smelter is only a minor cadmium producer.

The fundamentals for cadmium seem unchanged particularly for standard commercial grade (99.95% Cd) material for which the story is the same as it has been over the past year, with good availability and spot prices well below US$0.20/lb. Once again it appeared to be traders and speculators creating an artificially higher market. The supply surplus, worldwide, can only be eliminated by major production cutbacks and for the time being material continues to be freely available, particularly from producers in Eastern Europe and South America, in the US$0.10-0.20/lb range for all grades and forms. Even the technical squeeze on high-grade material appeared to have disappeared by the end of the month as supplies appeared from stocks in Rotterdam and the buying interest eased.

Chromium prices, particularly for aluminothermic grade, improved a little during June, with the disposal of the remaining lots of Russian/CIS material that were available in Rotterdam at US$4,300/t. Fresh supplies have yet to arrive, and in the meantime the Chinese are maintaining prices around US$4,600/t. The market will probably hold at this level until new supplies from Russia arrive in August and September.

Cobalt, for once, was the poor relation of the minor metals. Prices slipped further in June, with sales reported as low as US$12.00/lb for 99.30% Russian-grade material at the end of the month. There has been aggressive selling against a marked downturn in enquiries as most consumers are well stocked, particularly the Japanese, who appear to have once again almost completely withdrawn from the market in anticipation of lower prices.

In the US, the Defense Logistics Agency (DLA) awarded some 735,000 lb of cobalt granules to one buyer during June. The DLA approximated the value of this sale at US$9.22 million and now has only about 635,000 lb of cobalt that it can sell against its 6 Mlb sales plan for the fiscal year ending September 30.

The next spot sale of cobalt will be held on July 26 when the DLA plans to offer around 350,000 lb of the metal. The quantity offered in August will depend on the results of the July sale. The form of the material for future sales has not yet been determined. The DLA has scheduled a negotiated sale for September. If all the fiscal-year 2000 allocation is consumed by the end of August, this sale may still be held with the award occurring in early October as part of the fiscal-year 2001 programme. Sale decisions by the DLA could be a key influence on the movement of cobalt prices over the next few months.

Mercury at long last has started to pick up now that the Russian/CIS stockpiles appear to be exhausted. This leaves the remaining few producers of primary mercury, particularly the Spanish and Algerians, in a strong position, and although demand is not increasing owing to the environmentally unfriendly nature of mercury it is clear that restricted supplies are pushing prices higher. Whereas the Russian material had been freely available around US$125/flask, it is now difficult to find good-quality mercury below US$150/flask. The producers, however, will be careful not to push prices too high by managing their production, otherwise substantial quantities of secondary mercury are almost certain to appear again, particularly from Eastern Europe. □

LONDON PRICES

Metals		Jul 13
Aluminium	(US producer)	63.00-66.00 c/lb d/d
Antimony		$1,500-$1,575/t cif
Arsenic	(Rotterdam 99%)	$0.35-$0.45/lb
Bismuth	Bismuth	$3.10-$3.30/lb cif
Cadmium	(99.99%)	$0.18-$0.23/lb cif
..	(99.95%)	$0.16-$0.19/lb cif
Chrome	(UK 99%)	$9.00-$10.00/lb
Cobalt	(99.8%)	$12.70-$13.90/lb net
..	(99.3%)	$12.00-$13.00/lb net
Germanium		$580-$640/kg
Gold		£186.60($280.65)/oz
Indium		$110-$130/kg
Iridium	(J Matthey price)	$415/oz
Magnesium	(Norsk Hydro Euro. prod.)	€2.33/kg*
..	(US Free mkt, 99.8%)	$2,040-$2,100/t*
Manganese metal	(99.7%)	$950-$1,000/t
Mercury	(99.99%)	$140-$150/flask
Nickel		$3.80-$3.81/lb
Osmium		$400-$450/oz
Palladium	(J Matthey price)	$671.00/oz
..	(Free market)	$658.00-$668.00/oz
Platinum	(J Matthey price)	$557.00/oz
..	(Free market)	$552.00-$560.00/oz
Rhodium	(J Matthey price)	$2,450.00/oz
Ruthenium	(J Matthey price)	$160/oz cif
Selenium		$2.95-$3.40/lb cif
Silver		$5.01/oz
Tellurium	(UK lump & powder 99.95%)	$4.00-$6.00/lb net
Tin	(Kuala Lumpur)	RM20.30/kg

Ore & Oxides		Jul 13
Antimony	(60%)	$8.00-$8.50/t unit, cif nom*
Beryl	(10% BeO)	$75-$80/s ton unit BeO cif*
Chrome	(Transvaal, Friable 40%)	$48-$70/t, fob*
..	(Turkish, concs 48%)	$65-$70/t fob*
Columbite	(min. 65% comb. oxides)	$3.10-$3.80/lb cif*
Ilmenite	(54% TiO_2)	A$100-A$115/t fob
Lithium ores	(Petalite 4.2% Li_2O)	$180-$270/t fob*
	(Spodumene>7.25% Li_2O)	$385-$395/t fob*
Manganese ore	(48-50% Mn, max. 0.1% P)	$1.81-$1.90/t unit fob*
Molybdenum oxide	(conc 55-57%)	$2.80-$3.00/lb
Rutile	(Aust. 95-97% TiO_2)	A$760-A$885/t fob (bulk)
Tantalum oxide	(60% cif N. Euro port)	$42-$52/lb
Uranium	(Nuexco unrestricted/restricted U_3O_8)	$7.00/$8.10/lb
Vanadium	(98% V_2O_5)	$1.90-$2.10/lb cif
Wolframite	(65%)	$40-$45/t unit
Zircon sand	(std 66-67% ZrO_2)	A$560-A$660/t fob (bulk)

** Source: Metal Bulletin*

Alcoa up on takeovers

Aluminum Co. of America Inc. (Alcoa) kicked off the June quarter reporting season this Tuesday, posting net earnings of US$377 million, a 57% increase compared with the corresponding quarter last year. Perhaps just as impressively, the result was a 6% improvement over the three months to March 31, 2000 (*MJ*, April 14, p.293), despite a 9% decrease in the spot price of aluminium in the June quarter (as quoted on the London Metal Exchange) and higher energy costs.

Alcoa's chief executive, Alain Belda, attributed the continued increase in earnings to three factors: the company's focus on profitable growth, its 'business system' and a continued concentration on cost control. The group set a target in mid-1998 of reducing its annual costs by US$1.1 billion, and by the end of June had achieved US$884 million towards its goal. Alcoa noted that cost savings achieved in the June quarter would have been higher, but for the increase in worldwide energy prices, particularly for gas and fuel oil (aluminium production is inherently energy intensive).

The growth element in Alcoa's strategy was most apparent in the completion during the period of the acquisition of fellow US-based aluminium producer Reynolds Metals Co. The results for the June quarter include two months' worth of the operations acquired, excluding those Reynolds assets earmarked for disposal (interests in three alumina refineries and part of one smelter) as required by the competition authorities (*MJ*, May 5, p.341). The effect of the Reynolds acquisition was evident in the rise in the group's shipments of aluminium products to 1.36 Mt in the June quarter, compared with 1.13 Mt in the March quarter and 1.12 Mt in the June quarter of last year. Shipments of Alcoa's alumina and related chemicals actually fell slightly, to 1.80 Mt in the June quarter from 1.83 Mt in the March quarter, and 1.84 Mt in the June period of last year, consistent with the omission from the June 2000 figures of the refining capacity due for disposal.

The Reynolds acquisition helped to raise revenues to US$5.57 billion in the June quarter, a 38% increase compared with the corresponding quarter of last year, and 23% more than in the March quarter of this year despite the decline in primary prices. Revenues were also boosted by the acquisition during the quarter of Cordant Technologies Inc., principally a manufacturer of aerospace components, for about US$2.2 billion in cash plus the assumption of US$685 million in debt. Cordant and its subsidiaries contributed one month's worth of results to Alcoa's June accounts, as part of the 'engineered products' division.

The cost of the Reynolds acquisition, which was effected by the issue of 1.06 Alcoa shares for each share in Reynolds, must be brought into the reckoning from a shareholder's perspective by assessing the dilutive effect of issuing the additional shares. The merger necessitated the issue of about 68 million new shares at the start of May, worth US$4.36 billion, to bring the total issued at June 30 to 865 million from 734 million a year ago (the latest figure is post a two-for-one split in June, and the comparative figure is adjusted accordingly). The 57% growth in total earnings compared with the June quarter of last year was thus restricted to the still-respectable figure of 47% on a per-share basis, to US$0.47/share, based on the average number of shares on issue in the respective periods.

Another negative effect of the Reynolds and Cordant acquisitions, and the assets that they have added to Alcoa, is the necessary assumption of the associated debt into Alcoa's balance sheet. The group's long-term debt stood at US$4.92 billion (including the portion due within one year), up from US$2.72 million at the end of last year. The debt position has also been increased by the cash nature of the Cordant takeover: Alcoa's short-term borrowings increased almost ten-fold to US$3.40 billion at June 30, compared with US$343 million six months earlier. Cash and equivalents amounted to US$320 million at the end of June, and short-term investments were on the balance sheet at US$76 million. □

SHARE PRICES AND EXCHANGE RATES

Company	July 12 Local	Change 5-day %	Local % hi-lo	US$ mill. Mkt cap.
Alcan Aluminium (C$)	47.25	1.1	18	6,996
Alcoa ($)	32.50	9.2	32	28,276
Anglo Amer. Plat. (R)	196.00	3.2	87	6,233
Anglo American (£)	34.59	7.8	60	21,366
AngloGold (R)	266.00	–0.7	16	4,187
Anglovaal Mining (R)	23.35	–2.3	51	369
Antofagasta Holdings (£)	3.83	2.0	49	1,142
Arch Coal ($)	7.81	1.6	28	298
Ashanti Goldfields ($)	1.65	0.0	0	185
Ashton Mining (A$)	1.04	8.3	89	198
Asturiana de Zinc (€)	10.06	3.7	19	385
Barrick Gold (C$)	27.05	1.1	29	7,242
BHP (A$)	19.57	3.1	63	20,489
Billiton (£)	2.85	9.6	35	9,225
Boliden (C$)	2.08	18.2	14	301
Caemi Mineracao	215.00	–2.3	91	468
Cameco (C$)	18.75	3.3	28	716
Cleveland-Cliffs ($)	25.50	–1.7	28	273
Cominco (C$)	19.70	–1.7	11	1,141
CVRD (BR)	45.40	–1.3	74	10,114
De Beers (Linked Uts) (£)	16.84	1.9	64	10,163
Eramet (Eur)	44.45	–0.4	23	1,017
Falconbridge (C$)	17.40	–8.7	2	2,083
Freeport-Mc. C&G ($)	9.38	–3.8	4	1,484
Gold Fields Ltd (R)	25.30	–3.6	42	1,687
Grupo Mexico (MP)	32.30	0.9	18	2,152
Hindalco (Rs)	811.20	1.1	42	1,352
HZL (Rs)	8.90	4.7	13	84
Iluka (A$)	4.60	4.5	78	607
IMC Global ($)	14.69	5.9	28	1,682
Impala Plat. (R)	249.00	4.2	61	2,420
Inco (C$)	23.50	0.9	13	2,889
Industrias Peñoles (MP)	18.90	14.5	19	795
Iscor (R)	12.90	7.5	10	490
KGHM (Zt)	30.80	–4.3	66	1,438
Lonmin plc (£)	7.91	9.1	92	2,121
MIM Holdings (A$)	1.01	1.0	21	1,025
Minsur(PS)	5.15	–1.0	0	384
Mitsui Min. & Smlt. (¥)	823.00	–0.1	90	4,122
Newmont Mining ($)	20.88	–2.9	33	3,504
Noranda Mining(C$)	15.45	5.5	18	2,573
Norilsk Nickel (Rb)	209.93	–2.1	58	1,409
Normandy Mining (A$)	0.96	0.0	21	993
Norsk Hydro (NK)	3.68	1.9	95	11,215
North Ltd (A$)	3.84	–1.0	91	1,672
Outokumpu (€)	10.41	–1.0	14	1,231
Pasminco (A$)	0.94	–4.1	18	624
Pechiney 'A' (€)	49.60	12.3	19	3,830
Phelps Dodge ($)	39.75	4.6	10	3,129
Placer Dome (C$)	13.80	–1.1	18	3,046
Potash Corp. of Sask. (C$)	80.20	–1.8	64	2,849
PT Tambang Timah (Rp)	2600.00	0.0	10	139
Rio Algom (C$)	17.75	2.0	38	728
Rio Tinto plc (£)	10.98	6.8	35	18,502
RJB Mining (£)	0.56	–1.8	70	123
Stillwater Mining (US$)	28.56	4.8	29	1,100
Sumitomo Met. Min. (¥)	490.00	3.2	79	2,601
Teck 'B' (C$)	9.85	–3.0	15	716
WMC (A$)	7.87	6.4	63	5,313
Xstrata (SF)	388.00	–5.6	88	1,400

Share prices and exchange rates are intra-day Wednesday. 100 in the high/low column indicates that the share is trading at a high, 0 that it is at a low, based on local prices over the past 52 weeks.

Currencies July 12

Value of	£	$(US)
$ (US)	1.51	1.00
$ (Australian)	2.56	1.69
$ (Canadian)	2.24	1.48
Ringgit (Malaysian) Fixed official rate	5.75	3.80
Franc (Swiss)	2.47	1.63
Krona (Swedish)	13.38	8.84
Yen	163.09	107.73
Rand (SA)	10.29	6.80
€ (Euro)	1.59	1.05

Markka (Finnish) .....€1=Mk5.94573
Franc (French).....€1=FF6.55957
Deutschmark .....€1=DM1.95583

Source: Bloomberg

Rio Tinto opens North bid

The cash takeover offer of A$3.80/share made by the Rio Tinto group for North Ltd of Australia opened this Thursday (July 13). The offer is scheduled to close on August 14.

Last Friday, Rio Tinto confirmed that North's announcement of its decision to reopen the Sept-Iles iron-ore pelletising plant in Quebec (*MJ*, July 7, p.3) does breach the conditions of Rio Tinto's bid. However, Rio Tinto stated that it was not in a position to determine whether or not the breach was of sufficient magnitude to warrant using the breach to withdraw its bid, as North's announcement "did not contain sufficient information for an informed assessment of the financial impact".

Furthermore, Rio Tinto indicated that its main concern would be "significant expenditure and commitments" by North on port facilities and duplicative railway infrastructure related to the West Angelas iron ore project in Western Australia during the "relatively short period of its offer". A major aim of Rio Tinto's bid is to take advantage of the capital cost savings that would be achieved by developing the project with Rio Tinto's existing infrastruc-

ture. Such expenditure by North "would potentially be wasteful and would diminish the value of North to Rio Tinto", assuming the bid is successful.

Rio Tinto also noted that the waiting period under the US Hart-Scott-Rodino Antitrust Improvements Act of 1976 expired this Monday, indicating that the bid has not attracted adverse attention from the US competition authorities. □

Franco-Nevada leaves Canyon to pursue Seven-Up Pete

Canyon Resources Corp. of Golden, Colorado, and Franco-Nevada Mining Corp. of Toronto have reached agreement to terminate their financing agreement with respect to the Seven-Up Pete gold joint venture, in Montana. The settlement includes the dismissal by Franco-Nevada of its legal action filed against the joint venture in Denver in the middle of last month. The legal action had sought to rescind the financing agreement, to return all funds paid by Franco-Nevada under the agreement and to recover damages.

The financing agreement between the two companies was made in May of last year. Under the agreement, Franco-Nevada agreed in late 1999 to advance to the Seven-Up Pete joint venture US$3.0 million in cash, and to commit US$500,000 to maintain an existing environmental reclamation bond, to allow the joint venture to maintain its property rights in the project and to pursue a 'takings' legal action against the State of Montana (*MJ*, October 8, 1999, p.295). This legal action followed the state's I-137 initiative effectively banning the use of cyanide (*MJ*, November 20, 1998, p.407). The joint venture holds property including three deposits, including the McDonald project, located near Lincoln. Development has been prevented, according to Canyon, by I-137. Franco-Nevada advanced the necessary funds to the joint venture in return for the right to receive a 4% net smelter returns (NSR) royalty on any mineral production, or one third of the proceeds of any 'takings' action.

Although referred to as a joint venture, Seven-Up Pete is 100% owned by Canyon and its wholly-owned subsidiary, CR Montana Corp., following the withdrawal of Phelps Dodge Corp. However, the latter retains an interest in the project under the terms of the agreement whereby Canyon purchased Phelps Dodge's 72.25% holding in the joint venture, in return for a modest down-payment and extensive follow-up payments if the project were ever developed (*MJ*, October 3, 1997, p.276). This agreement with Phelps Dodge was modified on the entry of Franco-Nevada, such that Phelps Dodge would receive a payment of US$10 million on the issue of all necessary permits to develop the project, or one third of the proceeds of any successful 'takings' legal action.

This month's out-of-court settlement provides that Franco-Nevada will return to the joint venture all of its interests in the financing agreement, including the 4% NSR royalty and the one-third share of any 'takings', in exchange for the repayment of US$1 million of the US$3 million paid last year. The US$500,000 bond will remain in place until October 20, 2002, at which point Franco-Nevada's bond obligations will terminate. The president of Canyon, Richard De Voto, said that the company is "disappointed that Franco-Nevada has withdrawn". Canyon retains its belief in its case against the State of Montana, and appears determined to proceed.

Franco-Nevada recently agreed to merge with Gold Fields Ltd of South Africa in a major all-share deal (*MJ*, June 16, p.461).□

Cambridge plans move into Spain

Trading of shares in Cambridge Mineral Resources plc on London's Alternative Investment Market (AIM) resumed this Monday (July 10), closing at £0.185/share before subsiding slightly on Tuesday to £0.175/share. Trading in Cambridge had been suspended on June 15, at £0.1775/share, pending the company's announcement of its proposed acquisition of Recursos Metallicos SL of Spain. The deal is classified as a reverse takeover under AIM rules and thus required that suspension be requested by Cambridge. Recursos Metallicos' principal assets are three mineral projects in Spain: the Lomero-Poyatos polymetallic project, and the Salamon and Falle de Leon gold prospects.

The acquisition is to be effected by the payment of US$200,000 in cash and the issue to Tethys Iberian Minerals Ltd, the owner of Recursos Metallicos, of 7.50 million new shares in Cambridge, bringing the total issued to 46.48 million. The additional shares are scheduled to be admitted to AIM for trading on July 26.

As part of the deal, ownership of Recursos Metallicos will be transferred to Tethys by José Fidalgo, who is to become a non-executive director of Cambridge. Dr Fidalgo, professor of metallurgy at the Polytechnic University of Madrid, is employed by Recursos Metallicos as a consultant. Colin Andrew, a director of Cambridge, has an indirect interest in Tethys via Georgia Holdings Ltd, which holds 33% of Tethys, and the acquisition of Metallicos Recursos therefore requires the approval of a majority of shareholders in Cambridge other than Mr Andrew. A vote is scheduled to take place immediately after the company's annual general meeting on July 25.

Lomero-Poyatos is located in southwestern Spain, in the Iberian Pyrite Belt. Drilling and underground exploration have established indicated resources, split into two categories of mineralisation: massive sulphides totalling 4.25 Mt, at 5.76 g/t Au, 116.9 g/t Ag, 1.58% Cu, 5.71% Zn and 1.48% Pb; and semi-massive sulphides totalling 11.2 Mt, at 2.29 g/t Au, 70.8 g/t Ag, 1.26% Cu, 3.02% Zn and 0.98% Pb. Tethys has carried out a preliminary evaluation of the resource, based on open-pit mining, and further modelling is in progress.

The Salamon and Falle de Leon prospects are in Leon Province, northwestern Spain. Salamon is the subject of a joint-venture agreement for Recursos Metallicos to earn a 50% interest from Sociedad de Investigación y Explotación Minera de Castilla y Léon SA (Siemcalsa), a state-sponsored company that holds the mineral rights, by spending US$1.2 million over two years. The prospect has inferred resources of 433,000 t, at 7.86 g/t Au. The Falle de Leon property surrounds Salamon (and incidentally adjoins ground held by the Rio Narcea Gold Mines Ltd-Barrick Gold Corp. joint venture). Falle de Leon is also the subject of a joint-venture agreement with Siemcalsa, which has carried out preliminary exploration work. Under the terms of the joint venture, Recursos Metallicos can earn a

50% interest by spending US$800,000 over three years.

Cambridge retains its interests in exploration projects in Ireland, the Falkland Islands and Scotland. □

Market news

Swiss-based **Xstrata AG** has secured a US$300 million revolving credit facility, principally arranged by Credit Suisse First Boston and Société Générale, which the company intends to use to refinance its existing three-year loan facility. The new facility comprises two tranches, each of US$150 million. The first has a five-year term, and the second a one-year term committed, plus a three-year option. Loans drawn down under the new facility will bear interest at 40-65 basis points (100 bp = 1%) over the London Inter-Bank Offered Rate, depending on certain financial ratios. The facility is syndicated through seven other banks. Xstrata believes that the new loan facility, plus the proceeds of recent non-core disposals, will give it the funding ability to "pursue growth opportunities".

■ Vancouver-based **Winspear Diamonds Inc.** has received the hostile takeover offer announced by the **De Beers** group two weeks ago (*MJ*, June 30, p.497), and will post its formal response to shareholders no later than next Monday (July 17). The offer is due to close on July 28. Winspear's board of directors meanwhile "strongly urges shareholders not to make any decision" with respect to the offer, which it believes "significantly undervalues" Winspear. This week, the company released an updated scoping study of its Snap Lake project in the Northwest Territories (this issue, p.27), as part of its "value recognition programme", and announced that it is opening a data room under a confidentiality agreement basis to qualified companies.

■ Los Pelambres, the copper mine in Chile owned 60% by London-listed **Antofagasta plc** and 40% by a group of Japanese companies, has satisfied the terms of a completion guarantee provided by Antofagasta. The guarantee was made in favour of the banks and other institutions that provided finance for the project. Antofagasta is now released from the obligations prevailing under that guarantee, the most significant immediate consequence being the release of US$133 million set aside by Antofagasta in an escrow account to cover overruns, etc. These funds can now be put to other uses. The guarantee also provided the lenders with a charge over Antofagasta's 33.6% shareholding in a non-mining associate, Quiñenco SA. This charge is also released, offering Antofagasta the opportunity to borrow against this asset in future if it so chooses. Antofagasta notes that the release was achieved 18 months ahead of schedule, which highlights the strong early performance of the project, commissioned in November last year one month ahead of the original plan. The early release from the loan guarantees was signalled three months ago by the chief executive of Antofagasta's mining arm, Jean-Paul Luksic (*MJ*, March 31, p.257). Los Pelambres produced 146,000 t of copper in the first half of this year and, with the plant operating at 12% over its planned capacity, full-year output is now forecast at over 300,000 t (*MJ*, June 16, p.470). This is well ahead of the 271,000 t/y originally planned for the first five years of project life.

■ London-listed **Randgold Resources Ltd** has completed the proposed sale of half of the company's 80% interest in the Morila gold project in Mali to **AngloGold Ltd** of South Africa for US$132 million, and the two companies have agreed the terms of the joint venture that will manage the project (*MJ*, April 7, p.275). AngloGold and Randgold will each have 40% of the project, with the Government of Mali holding the balance of 20%. Final agreement follows the approval last month of shareholders in Randgold Resources. Randgold has

received the sale consideration, and has repaid a R312.3 million bridging loan advanced by **Barnato Exploration Ltd**, another company originally in the Kebble stable. The chief executive of Randgold Resources, Mark Bristow, said this week that after settling all current liabilities, the company would be left with US$90 million of the sale proceeds which it intends to apply to "new growth opportunities".

■ The London-based mining group **Anglo American plc** has agreed to dispose of a 68% shareholding in **LTA Ltd**, a Johannesburg-listed engineering, construction and project management group, specialising in mining, petrochemicals and infrastructure projects. The sale is the latest in a long list of non-core disposals by Anglo American (*MJ*, March 24, p.233). The sale agreement takes the form of an irrevocable undertaking by Anglo American to tender its shares to a R46/share takeover offer for 100% of LTA from **Aveng Ltd**, another Johannesburg-listed construction company which also has interests in steel distribution and cement manufacture. Anglo will receive about R900 million in cash for its LTA shares.

■ The positive effects of the privatisation of the Zambian copper mining industry are already being felt by the industries that supply the operations. Last Friday, the Zambian Government announced that it has distributed K292 billion (US$1 = K3,175) to creditors of state-owned **Zambia Consolidated Copper Mines Ltd** (ZCCM), out of a total of K423 billion set aside for the purpose in the government's 2000 budget. The Secretary to the Treasury, James Mtonga, issued a statement reiterating the government's commitment to clear all of ZCCM's trade creditors "in full as soon as possible". The Zambian Government has not detailed ZCCM's obligations to trade creditors, but the group's balance sheet at March 31, 1999 showed accounts payable at K527.9 billion, of which K439.9 billion was owed on goods and services, K30.2 billion on metal trading and K14.3 billion on finance leases.

■ The Australian-based zinc producer **Pasminco Ltd** has received A$22.95 million as settlement of an insurance claim with respect to the company's Elura operation in New South Wales. The sum represents a settlement of A$25 million, less amounts already paid and other deductions, to compensate for a collapse in the Elura mine in 1996 (*MJ*, March 22, 1996, p.215). Pasminco expects to book a gain of A$16.5 million (A$11 million after tax) in its accounts for the year to June 30, 2000.

■ **Barrick Gold Corp.** of Canada has posted its takeover offer to shareholders in **Pangea Goldfields Inc.** (*MJ*, July 7, p.1). The board of Pangea has recommended that shareholders accept, and all directors and officers of the company have pledged their shares to the offer, collectively accounting for 20%. The offer closes on July 28. □

People

The Queensland State Government has made Ted Campbell Director General of the Department of Mines and Energy, subject to the approval of the executive council, replacing Ron Boyle who died in April. Dr Campbell is promoted from Deputy Director General.

■ Tom Dale has been appointed as chief executive of **Mopani Copper Mines plc**, the joint-venture company established earlier this year by Glencore International AG (46%-51% voting), First Quantum Minerals Ltd (44%-49% voting) and state-owned Zambia Consolidated Copper Mines Ltd (10% carried) to operate the Mufulira mine, concentrator, smelter and copper refinery, and the Nkana copper mine, concentrator and cobalt plant in Zambia. Mr Dale will take over from Philip Pascall, who has served in the role of interim chief executive since April 3, when Mopani formally took control of the newly privatised assets (*MJ*, April 7, p.263). Mr Pascall moves to the position of non-executive chairman of Mopani. Mr Dale is a well-known figure in South African mining circles, until last September serving as managing director of the South African operations of Gold Fields Ltd, one of the world's largest gold producers (*MJ*, September 10, 1999, p.211).

■ Australian-based **Ashton Mining Ltd** has appointed Justin Gardener as non-executive chairman, replacing Paul McClintock who resigned last month following his appointment as head of the Cabinet Policy Unit of Prime Minister John Howard's administration (*MJ*, June 2, p.440). Mr Gardener is a former member of the board of partners of Andersen, the international consulting and accountancy group.

■ **Dia Met Minerals Ltd** of Canada has appointed James Rothwell as president and chief executive with effect from August 15, replacing James Eccott who is retiring. Mr Rothwell was formerly president of BHP Diamonds Inc., part of Broken Hill Proprietary Co. Ltd of Australia, Dia Met's 51% partner in the Ekati™ diamond mine in Canada. Dia Met holds a 29% interest in the mine, Canada's first diamond producer.

■ Brisbane-based **MIM Holdings Ltd** is expanding the role of its group executive for operations in Australia, Vince Gauci, to cover all of the company's operations worldwide. MIM's chief executive, Nick Stump, said last week that the move will extend the contribution Mr Gauci has made to the operating performance of MIM's assets in Queensland to the company's European operations and to its 50% interest in the Bajo de la Alumbrera copper-gold mine in Argentina, which MIM manages.

■ Colorado-based **Canyon Resources Corp.** has appointed David Fagin as a non-executive director. Mr Fagin was formerly chairman and chief executive of Golden Star Resources Corp., and has held senior positions with Homestake Mining Co. and Amax Inc.

■ Robert Yeoman has been appointed vice president of corporate development by **Expatriate Resources Ltd** of Vancouver, effectively replacing Douglas Goss who held the post of vice president of business development. Mr Yeoman, currently corporate secretary of Caussa Capital Corp., will also be nominated to join Expatriate's board at the company's annual general meeting on June 28. Expatriate has also appointed Justin Himmelright manager of environment. Mr Himmelright, who joins from Knight Piésold, will be responsible for the company's environmental programmes, and for securing the relevant permits for its Finlayson project in Yukon Territory.

■ The US National Mining Hall of Fame has announced its nominations for 2000. Eight persons are to be inducted, to bring the total of those "enshrined as leaders of the mining industry" to 159. This year's nominees include one living person, John Livermore, who was "a driving force behind the 1961 discovery of the Carlin gold mine in Nevada". The posthumous nominees include the three Kelce brothers, "who led Peabody Coal to become the nation's largest coal producer"; David Skillings Jr, who was editor and publisher of the weekly *Skillings Mining Review* until his death last year; and Simon Strauss, "an authority on the world's metal markets" and author of 'Trouble in the Third Kingdom'. The ceremonies will be conducted at a black-tie dinner at the Las Vegas Hilton on October 8 (on the eve of the MINExpo conference). □

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