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THE
AUSTRALIAN MINERAL INDUSTRY

VOL. 13. No. 3

PART 1 — QUARTERLY REVIEW

MARCH, 1961

Prepared in the MINERAL ECONOMICS SECTION

Chief Mineral Economist — J. W. MORGAN

Issued under the authority of
SENATOR the HON. W. H. SPOONER
MINISTER FOR NATIONAL DEVELOPMENT

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Information of interest to the mineral industry, corrections to published data, and suggestions will be welcomed.

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AUSTRALIAN MINERAL INDUSTRY

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MARCH, 1961

PROSPECTS FOR IRON ORE

In December, 1960, the Commonwealth Government announced a relaxation of the embargo on the export of iron ore which had been imposed in 1938. Evidence available in 1938 suggested that known Australian reserves of iron ore were small, and inadequate in view of the anticipated rate of depletion. Although reserves still cannot be termed large by world standards, they have been shown to be such that limited exports could be permitted from deposits other than those at present regarded as necessary to provide supplies for the domestic iron and steel industry.

In reviewing the iron ore situation in the light of this most recent development, it is pertinent to consider three points: what is being done to safeguard the domestic iron and steel industry; what the relaxation of the embargo is designed to achieve; and what prospects there are for selling Australian iron ore overseas.

The needs of the domestic iron and steel industry have been the dominant consideration in framing the conditions of export. The bulk of the demonstrated reserves of iron ore lie in areas from which export is prohibited — the Middleback Range-Iron Monarch area of South Australia, and the Yampi Sound area and the Koolyanobbing-Dowd's Hill-Bungalbin area of Western Australia. In these deposits there are estimated to be over 300 million tons of high-grade ore — i.e., containing more than 60 per cent iron — and further development may well add to this figure. The domestic

industry is thus assured of supplies from these deposits alone for at least the next thirty years.

In addition to the reservation of these high-grade deposits in their entirety, further safeguards exist in the export provisions. In general, not more than half of the proved reserves of direct shipping ore in any deposit may be exported, subject always to Governmental control as regards the rate and period of export and the grade of ore exported. (Direct shipping ore is ore of grade 50 per cent iron or better and suitable for blast furnace feed without further treatment other than sintering.) This ensures that at least half of the reserves of direct shipping ore in the larger deposits which may be worked for export will be retained for use in Australia.

The exception to this "50 per cent limitation" is that small deposits — not more than two million tons — may be mined for export in their entirety, and without limit on the annual rate of export. Such deposits would in general not have been of any interest to the Australian industry because of their disadvantages in grade or location. However, further work on some of these with a view to export will determine whether they have any economic future at all. It is to be expected that many will remain unworked.

Special consideration will be given to requests to export low-grade ore, refractory ore and concentrates prepared from low-grade ores. The majority of the deposits from which such exports would be expected

are virtually untested, so that it has not been possible to fix on such relatively firm conditions as for direct shipping ores.

A point which should not be overlooked is that the Commonwealth's permission to export iron ore is conditional on the appropriate State mining title bearing no prohibition of exports. It is not improbable that deposits which have been hitherto comparatively untested may on further examination prove sufficiently attractive to suggest to State Governments the establishment of a steel industry within their borders.

Control of exports thus will be both firm and flexible—firm, to guard against wasteful mining and premature exhaustion of the higher-grade portions of a deposit, yet flexible in that there is room for variation in the terms of issue of individual export licences and for consideration of special cases such as ore deposits requiring beneficiation to provide marketable raw material. In addition these controls provide adequate safeguards of raw material for the domestic iron and steel industry and offer a basis for the assurance of further supplies, possibly also for expansion of the iron and steel industry to an extent greater than that planned at present.

The latter projections of events, of course, are largely dependent upon the revised policy achieving the Government's two objectives—to earn export income and to stimulate additional exploration and development. These are inter-dependent, and while the former is of immediate importance to the national economy the latter is more important from the long-term viewpoint.

The earning of additional export income is a matter of urgent national concern. The building up of a sizeable export trade in iron ore would be not only of immediate economic benefit but of lasting value to the economy as a continuing and reliable feature of overseas trade. Although iron ore is a relatively low-priced commodity, it is not subject to the wide price fluctuations which

affect many other of Australia's important mineral exports, and thus possesses an element of stability favourable to forward planning.

However, the price of 60 per cent grade iron ore is about £4 per ton f.o.b. and it would therefore be necessary to export several million tons a year to make a significant impact on the balance of payments position. On the basis of what is known of those deposits not now reserved it would not appear possible to build up exports of this magnitude in the immediate future. The foundation of a substantial export trade can, therefore, only be laid by further testing and development of existing deposits and by intensive exploration for new ones.

Developments may also be expected in the beneficiation of low-grade or refractory ores which to date have not been attractive to domestic consumers and to which the "50 per cent limitation" does not apply. Whether it is likely that more emphasis will be placed on direct reduction of low-grade ores is a matter of conjecture at the moment. The possibilities are being investigated in respect of at least one deposit, but the future for a product such as sponge iron depends ultimately on its ability to compete on overseas markets with high-grade ore and with scrap.

It should not, of course, be inferred from the foregoing that exploration and development have not been going ahead while the export embargo has been in force. Pilot plant work on beneficiation of the low-grade jaspilites of the Middleback Ranges has been in progress for some time and if successful should open up a substantial body of new ore reserves. Of equal importance is the testing programme still in progress in the Constance Range area of north-west Queensland, where successful results might add very materially to Australia's demonstrated ore reserves.

The geographical position of Constance Range and the present structure of supply

of ore to the domestic iron and steel industry are such that even if deposits of economic size and grade are proved in this area their development must take a considerable time.

Pending the final assessment of the Constance Range deposits, it may be said that only three deposits—Mt. Goldsworthy and Wilgie Mia in Western Australia, and Savage River in Tasmania—appear at the moment to have any potential for sustained exports. None of these has adequate transportation outlets. In fact Savage River has none (and the high titanium content of the ore, which has also to be beneficiated, presents a further serious drawback). Wilgie Mia, at 300 miles from port facilities at Geraldton, is no more than a marginal proposition on available evidence. Mt. Goldsworthy, the best prospect of the three, has no harbour facilities nearer than Port Hedland, 70 miles away, and these are inadequate to cope with any large-scale ore shipments.

On the other hand it must be borne in mind that exploration and testing might greatly improve the prospects of these or other deposits—possibly the numerous deposits north of Southern Cross and outside the Koolyanobbing-Dowd's Hill-Bungalbin reserve.

In fact, few accurate assessments of deposits other than those comprising the demonstrated reserves can be made, because not enough testing has been done. It is thus not possible to make any reliable estimate of export capacity.

It is equally difficult to estimate the probable extent of export trade in iron ore in the short term. Iron ore is not a rare commodity and producing deposits are comparatively widespread throughout the world. Production has hitherto been able to keep pace with steadily increasing world consumption. The price is relatively stable and the bulk of ore is sold on long-term

contracts. It is evident that successful entry to the world trade will depend largely on Australia's particular economic, geographical or political circumstances.

The immediate prospects for selling Australian iron ore are limited to the Pacific area. The pattern of iron ore trade in the Pacific is fairly well established, with several important exporters in and near the area and two major importers, Japan and the United States. The latter appears to offer little prospect for Australian exports; iron and steel capacity on and near the Pacific coast—the only market at which Australia might aim—amounts to only about 5 per cent of total United States capacity, and any import needs are likely to be adequately met by shipments from South America. Interest must, therefore, be concentrated on the Japanese market.

The Japanese iron and steel industry is expanding with astonishing speed and its needs have long since outstripped the small local production of iron ore. Crude steel output in 1960 was 22 million tons, an increase of 6 million tons in one year, and the latest target set by the industry is a production of 48 million tons in 1970. This would make Japan the third largest steel producer in the world.

To support this expansion, Japan will have to import steadily increasing quantities of iron ore, rising to 49 million tons in 1970. Much of the demand will be met from established sources, with sharp increases in shipments from India, Goa, Peru, Chile and southern Africa and continuing supplies from Malaya, U.S.A., Canada and some other countries. However, it has been forecast that these sources may not be able to provide more than about 31 million tons in 1970, so that there will be a progressively increasing demand for new sources of supply.

This predicted shortfall of supply would appear to present a favourable future large-

scale market for Australian iron ore, provided that a foothold can be gained now. Nevertheless it should be borne in mind that established suppliers to Japanese industry will endeavour to increase capacity to the utmost; as a result the shortfall may not be as large as is now forecast. In addition, there will probably be discoveries of new deposits in producing countries and the Japanese search for supplies will extend to Alaska, the Soviet Union, North Korea and Communist China, all more favourably situated geographically than Australia.

There are, however, encouraging characteristics to be discerned in the pattern of Japanese iron ore imports. Imports are spread over several sources. Long-term contracts are favoured. Japanese interests have the resources to participate where required in exploitation, by providing capital for mining or ships for transportation. The Japanese policy of drawing supplies from as wide a field as practicable, coupled with Australia's relative proximity to Japan vis-à-vis India, South America and Africa,

should weigh in Australia's favour, provided that transport costs are competitive.

The relaxation of the export embargo may thus result in moderate exports in the short term, provided that transportation facilities are provided, and offers the possibility of exports on an increased scale in the long term, provided that a foothold can be gained in the Japanese market in time to take advantage of any substantial increase in our proved reserves. Both short-term and long-term prospects depend very much on successful exploration and development work.

The proving of new reserves of iron ore will not only provide further export capacity but will also assure the expanding Australian iron and steel industry of additional supplies of raw material. The industry might then find itself in a position where it could maintain its capacity continuously in excess of local requirements and would be able to take advantage of any opportunity of building up a permanent export trade in Australian iron and steel.

Production of aluminium at Bell Bay (Tasmania) in 1960 was 11,655 tons, compared with 11,370 tons in 1959. Alumina production was 29,801 tons, compared with 26,900 tons in 1959.

Imports of bauxite in the nine months ending September, 1960, were 74,392 tons; in the same period 20,026 tons of ingot valued at £4,897,165 were imported. Aluminium ingot was thus still the most important primary mineral import other than oil. Corresponding imports of bauxite and aluminium in the first three quarters of 1959 were 56,770 tons and 11,255 tons.

The association between Consolidated Zinc Corporation Ltd. and Kaiser Aluminium and Chemical Corporation was taken a stage further in December, 1960, by the registration of two new companies. These are Comalco Industries Pty. Ltd. with a nominal capital of £25 million and Comalco Aluminium Products Pty. Ltd. with a nominal capital of £10 million. The former, owned jointly by Consolidated Zinc and Kaiser, is a holding company, owning the whole of Commonwealth Aluminium Corporation Pty. Ltd. (Comalco) and Comalco Aluminium Products Pty. Ltd. and two-thirds of Aluminium Production Corporation Ltd. (Apco). The remaining one-third interest in Apco is owned by the Tasmanian Government.

The structure of an integrated aluminium industry controlled by the Consolidated Zinc-Kaiser partnership has been completed by the registration of Comalco Aluminium Products Pty. Ltd. This company will produce extruded and other semi-fabricated forms. The partnership, through Comalco Industries Pty. Ltd., will control production of bauxite and alumina by Comalco at Weipa, production of aluminium by Apco at Bell Bay, and fabrication. The partnership will also produce aluminium from Weipa alumina on an extensive scale at Invercargill, New Zealand.

ALUMINIUM

Export possibilities for bauxite were enhanced by a report from Tokyo in December that the Mitsubishi Chemical Company proposed to enter into primary aluminium production, with technical assistance from Pechiney. It was reported that bauxite would be shipped "by Western Mining Corporation" — presumably by Western Aluminium N.L. — for a new plant whose capacity would be 50,000 tons of aluminium by late 1964, but the probable extent of shipments was not indicated. Early in December the three existing Japanese smelters concluded contracts with Comalco for the supply of trial shipments of 10,000 tons each of Weipa bauxite, having already taken trial shipments of Western Australian bauxite.

Year-end reviews of the world aluminium industry showed a notable advance in primary metal production in Japan, where it increased by 30 per cent over the 1959 figure to 131,000 tons in 1960. Capacity is still less than requirements, and production, which is entirely dependent on imported bauxite, should continue to expand. Although the recently reported target of 300,000 tons by 1965 may appear optimistic, it is in keeping with the expansion pattern in other sectors of the Japanese metal industry. This target could well be revised upwards if local use of aluminium in automotive and constructional engineering accelerates in line with movements in some other countries.

Production of primary metal in the United States rose by 3 per cent over the 1959 figure to a new peak of 2,015,000 short tons. Shipments were down by about 6 per cent on 1959, and plant inventories rose to a record high level of 259,000 tons, an increase of 147,000 tons in the year. Although consumption was probably a good deal higher than these figures indicate, owing to consumers drawing on their inventories carried over from 1959, the inevitable result

of the decline in demand and the build-up of producer inventories was the closing down of some primary production facilities; it is not expected that any of these will re-open until mid-1961 at the earliest. At the beginning of February, 1961, primary metal producers were operating at about 75 per cent of their capacity of 2,468,000 tons. However, although forecasts have been guarded, it appears likely that United States consumption will increase in 1961 in building and construction, in the automotive industry and in containers (although tinplate has recently shown some recovery).

Although the short-term outlook for primary metal producers in the United States is not over-promising, and the lag of consumption behind production capacity appears likely to entail restraints on production for some time to come, another smelter will probably open within the next two years. This will be a Pacific Coast subsidiary of Cerro Corporation; the Corporation already has fabricating facilities (Fairmont Aluminium) and is thus following established

practice in developing its own source of primary metal.

World production in 1960 is estimated to have been nearly 4,000,000 metric tons, with consumption slightly less than this, the balance being absorbed in producers' stocks. The market in semi-fabricated products throughout the year was characterised by severe price competition. Highlights of the picture outside the United States and Japan were a sharp increase in United Kingdom imports from 250,000 tons in 1959 to 312,000 tons in 1960, and marked increases in primary metal production in various countries, notably West Germany (up 12 per cent) and Norway (up 9.5 per cent).

The price of domestically produced aluminium ingot (1-20K) and the price of imported metal remained unchanged at £271 per ton, delivered capital cities, and £233 per cent c.i.f. respectively. The Canadian ingot price and the United States domestic price for unalloyed ingot remained unchanged at 23.25 cents per lb. and 26 cents per lb. respectively.

ANTIMONY

Domestic production of antimony ore, recorded as mine despatches, for the first three quarters of 1960 was approximately 200 tons compared with more than 1,000 tons for the whole of 1959. Virtually all production in 1960 was from New England Antimony Mines N.L. operating near Guyra (New South Wales). The mine is now controlled by Consolidated Metal Products Ltd. and although operations are carried on essentially to meet the company's own requirements, some 100 tons of concentrate were exported to India in mid-1960. In line with reduced output from the New England mine imports of antimony ores and concentrates increased in 1960 and were 253 tons for the first three quarters of the year, compared with 37 tons for the whole of 1959. Mainland China replaced South Africa as the

main source of supply. Imports of antimony and antimonial compounds continued at about the same level and totalled 137 tons for the first three quarters of 1960 — 174 tons was the total in 1959.

The domestic price of antimony metal, which was reduced from £335 to £270 per ton in February, 1960, following the lifting of import restrictions, was increased to £285 per ton in mid-October as a result of a firm overseas market; the domestic price was further increased to £295 per ton in February, 1961. Domestic price of antimony concentrate continued at 20/- per unit 60% Sb; recently prill ore has been quoted at 26/- per unit for 60% Sb.

Effective as from 1st January, 1961, the United Kingdom price of English regulus

99.6% Sb was increased from £stg.207½ to £stg.217½ per ton. In mid-January, 1961, the United Kingdom price of Chinese regulus was increased to £stg.166-£stg.168 per metric ton c.i.f., an increase of £stg.14 per ton. In addition the previous duty of £40 per ton has been altered to a 25 per cent duty, thus raising the effective price of Chinese material to United Kingdom consumers to about £stg.210 per metric ton.

ASBESTOS

Production of crocidolite by Australian Blue Asbestos Ltd., as reported by the Western Australian Mines Department, was 4,461 short tons in the third quarter of 1960, bringing the total for the nine months to the end of September to 10,856 short tons. Production of chrysotile in the nine months ending September was 863 short tons.

Exports of crocidolite in the first eleven months of 1960 were 7,481 short tons and

In the United States, increased demand for antimony oxide in the plastics industry caused a rise of 0.75 cents per lb. in the price of imported antimony early in November, 1960, raising the quotation for 99.6% material, 5-ton lots, duty paid New York, to 26.75-27.5 cents. Following the United Kingdom price rise in January, 1961, the United States price of imported metal rose by a further 1.25 cents per lb.

of chrysotile and others 122 short tons.

Imports of chrysotile and amosite in the first three quarters of 1960 were 20,977 and 7,853 short tons respectively.

Production of asbestos cement building sheets in the eleven months ending November, 1960, was 28.14 million square yards; production for the year almost certainly exceeded the previous record output of 29.13 million square yards in 1959.

BARITE

The improvement in barite production was well maintained during the January-September period of 1960 — production was 7,583 tons; the previous highest level of production over a similar period was 7,497 tons for the January-September period of 1957.

A further substantial rise in the demand for barite for oil drilling in British Borneo,

New Zealand and Papua-New Guinea led to a new record level of exports. Exports during 1960 were recorded at 7,649 tons, of which 4,014 tons were shipped to British Borneo, 3,102 tons to New Zealand, 530 tons to Papua-New Guinea and 3 tons to Timor. Only 108 tons of barite were imported during the January-September period, compared with 347 tons for the corresponding period in 1959.

BERYLLIUM

Production of beryl for the first three quarters of 1960 was 164 tons containing 1,909 units BeO compared with a total of 317 tons (3,592 units BeO) in 1959.

Preliminary figures indicate exports of beryl in 1960 were approximately 148 tons. All exports were to the United States; prior to 1959, in which year exports were

prohibited, beryl exports had been restricted to the United Kingdom.

The Australian Atomic Energy Commission is again purchasing and stockpiling beryl, but on a reduced scale. The current buying price is quoted at £13/10/- per unit BeO, f.o.b. nominated stores in capital cities.

Overseas, United States consumption of

beryl in 1960 is estimated to have been 9,500 short tons, an increase of about 60 per cent on the 1959 level. Of this total an estimated 8,800 short tons were imported. It is announced that by the latter part of 1961 Brush Beryllium will have in operation a large commercial concentrator capable of

COAL

Production and exports of black coal in the January-November period of 1960 amounted to 20,842,000 tons and 1,449,000 tons respectively. Exports for the same period in 1959 were 701,000 tons. Provisional figures for the year show a production of 22,566,000 tons; exports should be well in excess of 1,500,000 tons with a value of £6 million. This compares with 1959 figures of 20,298,000 tons production and 794,000 tons exports.

The bulk of this increased production and exports came from New South Wales, where production rose in 1960 by more than two million tons and exports from 753,000 tons to 1,552,000 tons, of which 88 per cent went to Japan. A further important contract for the supply of New South Wales coal to Japan was announced in January, 1961. The contract, between Clinton's Nattai Collieries Pty. Ltd. and Fuji Iron and Steel Co.,

COPPER

Mine production of copper in Australia in 1960 exceeded 100,000 tons for the first time. Preliminary data indicate that the total for the year was about 110,000 tons, compared with 94,700 tons in 1959. Current indications are that production in 1961 will be at about the same level.

Domestic despatches of copper in concentrates and direct smelting ore to smelters were 67,000 tons; the copper content of copper concentrates exported, principally to Japan, was 33,000 tons.

Production of primary blister for the year was 71,237 tons; in addition 2,822 tons

handling non-pegmatite and low-beryllium ores. The plant will use a recently developed flotation process and is claimed to be able to work ores with as low as 0.07% BeO content. It is predicted that with the introduction of this new process the United States will become self-sufficient in beryllium.

provides for the export of 1,000,000 tons over a five-year period, commencing in 1961.

Prospects for further substantial exports of coal appeared with a report in January from the Japanese Iron and Steel Federation that the Japanese steel industry hopes to import more coking coal from Australia. It was forecast that the Australian share in Japanese supply might rise from 10 per cent at present to 23 per cent by 1970, provided that the Japanese steel industry meets its expansion programme. The principal competition would of course come from the United States. This report is of particular interest in connection with current Japanese interest in Kiangsu coal, as well as in established sources of supply in New South Wales and elsewhere.

Brown coal production in Victoria in the period January-November was 13,800,000 tons; production for 1960 was 14,975,000 tons, a new record.

of blister were produced from secondary material; of the 82,098 tons of refined copper produced 70,658 tons were of primary origin, 5,307 tons from purchased scrap, and 6,133 tons from toll charge scrap. Total domestic despatches of refined copper were 63,287 tons compared with 57,764 tons in 1959. Shipments overseas of refined copper for the year amounted to 12,388 tons compared with 2,749 tons in 1959. On the other hand only 502 tons of blister were shipped compared with 16,217 tons in 1959.

Notwithstanding the significant increase in exports of refined copper, some special

shapes not available as yet from Australian refineries are still being imported; these imports are running at a rate of about 3,000 tons annually. However, with the provision of additional plant at Townsville and Port Kembla during 1961 imports should cease as from this year.

Amendments to the Copper Bounty Act following the Government's consideration of the Tariff Board's report on copper tabled in Parliament in November, 1960, provide in effect that the price of copper in Australia will not fall below £305 per ton; in addition where the price does not exceed £305 the maximum bounty payable will not exceed £35 per ton. Bounty is payable on domestic sales of refined copper, subject to a profit limitation of 10 per cent; for every £1 that the price exceeds £305 the bounty falls by an equivalent amount.

Prior to 1st January, 1961, the price of copper in Australia was fixed weekly by the Copper Producers' Association. The price was related to the London Metal Exchange price, with an adjustment for freight and other charges. Generally speaking the price varied weekly, the extent of the fluctuations depending on the daily movement on the London market. To overcome these almost weekly changes it was decided to adopt a new basis of price formulation.

The new arrangement is based on a running average of the Australian equivalent of the London spot buying and selling price plus the normal Australian premium of £15 per ton; the period over which the running average is taken has not been disclosed. Alterations to the price are only made when the variation from the previously operative price is not less than £10. It is expected that this new pricing arrangement will introduce

Mine production of gold in 1960 was 1,084,794 fine oz., which was 310 fine oz. less than in 1959. Total production of refined gold of Australian origin in 1960 was

a considerable element of stability in the Australian price by eliminating to a large extent the effect of short-term fluctuations on the London Metal Exchange.

During the last quarter of 1960 the price of copper on the London Metal Exchange fluctuated within the range of £stg.220-230 per ton. During January, 1960, a somewhat weaker tone emerged with the price falling to £216 per ton. In February the price moved back above £225 with the prospect of labour disputes in Rhodesia and Chile.

Following the fall in the United States domestic producers' price from 33 cents per pound to 30 cents early in October, 1960, the position was held until mid-January when it fell to 29 cents; customs smelters had dropped their price from 30 cents to 29 cents on 11th January.

Compared with recent years there was a very substantial increase in world production of copper in 1960. Reported deliveries to consumers were also at a much higher level but on balance there was a substantial increase in stocks; of particular interest was the substantial increase in exports of copper from the United States during 1960; imports into the United States were also at a lower level, reflecting the downturn in consumption in that country.

As a result of the build-up of world copper stocks and the probability that consumption would be unlikely to match current production, much less permit a working-off of stocks, several major world producers have in recent months announced curtailments in production. It would appear that in total the extent of the announced cut-backs represent a reduction at an annual rate of about 200,000-250,000 tons.

GOLD

1,045,139 fine oz., 21,990 fine oz. less than in 1959.

Payments of subsidy under the Gold Mining Industry Assistance Act in 1960 were

£814,598, bringing the total payments since the inception of the act in 1954 to £3,778,240.

Recorded exports of refined gold during 1960 amounted to 2,513,645 fine oz., of which 2,300,211 fine oz. were shipped to the United Kingdom. It is believed that some of the shipments to the United Kingdom were of gold purchased by the United King-

IRON AND STEEL

Production of iron ore in the first nine months of 1960 was 3,218,966 tons, made up of 2,562,292 tons from the Middleback Range (South Australia), 590,236 tons from Yampi Sound (Western Australia) and 66,438 tons from Koolyanobbing (Western Australia). Production in the same period of 1959 was 3,074,987 tons. Imports from New Caledonia amounted to 200,343 tons, valued at £223,469, in the first three quarters of 1960.

Pig iron and ingot steel production achieved new record levels month by month throughout 1960. Pig iron production for the year was 2,881,000 tons, and ingot steel production 3,680,000 tons. Ingot steel production was 3.5 million tons in the year 1959-60 and is expected to approach 4 million tons in the current financial year following the completion in November, 1960, of another open-hearth furnace at Port Kembla, at a cost of £3½ million.

A strike of maintenance tradesmen at the Newcastle steelworks of the Broken Hill

dom over a period but which had been held in Australia.

The Gold Producers' Association took advantage of the rise in price to sell over 380,000 oz. during October-December on overseas premium markets. The price realised in these sales averaged £15/14/1 per fine oz. in October, £15/16/7 in November and £15/15/6 in December.

Pty. Co. Ltd. ran for three weeks in January, with progressive cutting back of raw steel production. Production loss was reported to have been 65,000 tons.

Considerable interest has been aroused by a proposal by Mineral Mining & Exports (W.A.) Pty. Ltd. to establish a sponge iron industry based on low-grade iron ore deposits in the Scott River area of Western Australia. The Acting Premier of Western Australia announced in January that the company proposed to establish a £5 million plant by the end of 1964 in return for extensive mining leases. The annual capacity of the plant would be 250,000 tons of sponge iron, and expansion to an annual capacity of 500,000 tons (at a cost of a further £5 million) and possibly 1,000,000 tons would be envisaged. The success of such a project, as has been pointed out elsewhere, depends on the ability of sponge iron to compete with high-grade iron ore and scrap on the open market. Developments are awaited with interest.

LEAD

There was a further fall in Australian mine production of lead in 1960. Preliminary data available indicate that the total for the year was about 306,000 tons, a fall of 10,300 tons compared with 1959 and 27,750 tons below the record level of 333,753 tons in 1957.

Production of primary refined lead at Port Pirie (South Australia) was 189,823 tons. In

addition 53,095 tons of lead bullion were produced at Mt. Isa.

Domestic despatches of primary refined lead for the year were 32,985 tons and shipments overseas for the year were 132,957 tons; shipments of bullion to the United Kingdom for refining were 49,650 tons. The lead content of lead concentrates exported was 52,200 tons in 1960.

The further fall in mine production of lead and the curtailment of total market offerings of refined lead during 1960 were in accordance with the voluntary restraints entered into by major producers as a contribution to the world oversupply position in lead. At the September meeting in Geneva of the International Lead-Zinc Study Group certain countries, including Australia, indicated their willingness to maintain the policy of restraints until March, 1961. The third session of the Study Group will be held in Mexico City in March, 1961, when the situation will be reviewed again.

With smelting at Cockle Creek (New South Wales) scheduled to commence in the second half of 1961, there will be a reduction in the quantity of lead concentrates exported. However, to the extent that there is a fall in exports, this will be offset by an increase in shipments of bullion. Production of bullion from this plant will be about 35,000 tons annually.

The price of lead in Australia has been maintained at £100 per ton f.o.b. Port Pirie since the current pricing arrangement was introduced late in December, 1958.

The downward trend of the lead price on the London Metal Exchange continued to the end of 1960 and a nadir of £stg.61½ for spot metal was recorded on 29th December; this was the lowest price since 1946. The downward trend was reversed in January and the peak price for the month was £64½ per ton. The situation was basically unchanged in February although there was a tendency towards firmness in the market.

In the United States the price of lead was held at 12 cents per pound throughout the year until mid-December, when the quotation was dropped to 11 cents. There had been no further change in the United States price to the end of February, 1961.

The downward trend in world stocks of refined lead held by producers which had occurred during 1959 was reversed in 1960

and by mid-year total world stocks as reported to the American Bureau of Metal Statistics were 369,000 short tons; in the second half of the year there was a further accumulation of stocks within the United States but elsewhere the position overall was virtually unchanged.

Mine production of lead in the United States in 1960 fell further and at 244,000 short tons was the lowest annual figure this century. However, had it not been for strikes in Idaho which accounted for a loss of about 15,000 tons in the second half of the year, the total for 1960 would have exceeded that for 1959.

In the United States further attempts are being made to give assistance to domestic lead and zinc producers. Early in January a bill was introduced into Congress proposing subsidy payments to small producers. The bill is on similar lines to that passed by Congress in 1960 but vetoed by the President.

Late in January a bill was introduced by the Chairman of the Interior Committee; this bill provides for:

- (a) Subsidy payments on sales of new production of domestic ores and concentrates up to 2,000 tons of lead and 2,000 tons of zinc in any 12-month period; payment would be based on the difference between 16 cents a pound for each metal and the actual market price.
- (b) A permanent import tax of 2 cents a pound on lead and zinc metal and 1.4 cents on ores and concentrates; also a removable tax of the same amount on both metals which would be applied when the domestic price of either metal moves below 13½ cents and removed when the market rises above 14½ cents.
- (c) A compensatory tax on the lead and zinc content of imported manufactured goods of 2 cents per pound in addition to present levels.

MANGANESE

Recorded production of manganese ore in the period January-September, 1960, was 44,264 tons of metallurgical grade, 695 tons of battery grade and 855 tons of intermediate grade for use in the uranium oxide extraction plant at Rum Jungle. Of this total 41,279 tons represent shipments from Western Australia, 33,932 tons being exported, the bulk of this to Japan. The decrease in local shipments to 7,852 tons from 12,522 tons in the same period of 1959 results from temporary suspension of purchases by the Broken Hill Pty. Co. Ltd., pending completion of the ferro-alloy plant at Bell Bay, Tasmania.

Imports of ferro-manganese continued at the high level reached in the first half of 1960 and amounted to 9,028 tons in the third quarter, valued at £517,000. These imports

may be expected to contract when the Bell Bay plant is operative.

A recent report from Japan gives an interesting comparison of Russian and Australian manganese ore bought by Japan. The Australian ore is higher in Mn, and cleaner, and is suitable for the production of low-and medium-carbon ferro-manganese, which the Russian is not.

Prices showed no change throughout the period August-December. At the end of the year the United Kingdom price for 46-48% Mn ore was stg.5 6-5/11 per unit c.i.f. The United States nominal price for 46-48% Mn Indian ore (before duty) was 87-90 cents per long ton unit c.i.f., and for 48-50% Mn Brazilian ore the quoted price was 91 cents per unit.

MINERAL OIL

The activities of the companies and groups engaged in oil exploration during November and December, 1960, and January, 1961, are summarised below:

Queensland: The Union-Kern-A.O.G. (UKA) Cabawin No. 1 well had reached a depth of 9,933 feet on 8th December, 1960, when the well blew out and had to be shut in until brought under control the following day by using heavy mud. 9½" casing has been run and cemented. At the end of the period under review fishing was in progress to recover 24 drill collars left in the hole.

Pickanjinie No. 2 was spudded in by Associated Australian Oilfields N.L. on 9th January, 1961. This well is located one mile south-south-east of Pickanjinie No. 1 which tested 6.5 MMCF/D gas in 1960. It has been drilled to a depth of 5,484 feet. A drill stem test on the interval 5,270-5,484 feet established a gas/water contact in the Hosptial Hill sands.

Other operations in the State include geophysical surveys by the Bureau of Mineral Resources in the Emerald and Winton areas.

Other organisations active in the State are Phillips Petroleum Co., Union Oil Development Corp. (with A.O.G.), Associated Freney Oil Fields N.L. and The Papuan Apinaipi Petroleum Co. Ltd.

New South Wales: At Baulkham Hills No. 1 being drilled by Australian Oil and Gas Corp. Ltd. the depth was last reported as 2,280 feet. Gas shows have been reported at 906-910 feet, 1,035-1,050 feet, 1,226 feet, 1,769 feet and 1,987 feet.

The Terrigal No. 1 well being drilled for J. Strevens and Associates was last reported to be drilling ahead at 1,590 feet.

Victoria: In the Port Campbell No. 2 well the side-tracked hole was drilled to a final depth of 8,846 feet. A series of formation tests on nine zones between 8,735 feet and 5,349 feet indicated the formation from 8,725 to 8,735 feet to be impermeable. The eight other zones tested between 8,725 feet and 5,349 feet contained gas-saturated salt water. This well has now been abandoned.

Port Campbell No. 3, also being drilled by Frome-Broken Hill Co. Pty. Ltd., has

been spudded-in. The location is about 4½ miles north-west of the No. 2 well.

South Australia: After a lull in oil exploration activities it is encouraging to see that drilling has commenced at Penola in the south-east of the State. A stratigraphic test is being drilled by Oil Development N.L.

Western Australia: Following geophysical surveys in the Hill River-Dongara area, West Australian Petroleum Pty. Ltd. (WAPET) is now moving in its National 100 rig to a location in the Eneabba area west of Three Springs, and preparing to drill a deep stratigraphic test. This well will be the first deep hole in the Perth Basin.

Sales of high-grade monazite concentrates, particularly from Western Australia, showed a substantial increase in 1960 compared to previous years. Recorded sales for the first three quarters of 1960 totalled 372 tons, 252 tons from Western Australia and the balance from east coast producers. Of this total, 250 tons were sold to the Australian Atomic Energy Commission, the balance going to overseas buyers. Preliminary export figures indicate that approximately 158 tons of monazite were exported during 1960, the bulk of exports going to the United States. It is understood that a large shipment of about 600 tons of monazite was made from Western Australia to the United States early in 1961. Although exports have risen markedly in quantity, prices are very weak and current sales are being made at about £30 per ton f.o.b.

Overseas demand for Australian opal reached an all-time high in 1960; the value of exported stone for the January-September period was £760,407, an increase of more than 60 per cent over the corresponding

Northern Territory: Spirit Hill No. 1, drilled by Westralian Oil Ltd., was completed at a final depth of 3,003 feet. This well is the deepest stratigraphic test to be drilled in the Territory.

Papua-New Guinea: Iehi No. 1 well was drilled to a final depth of 10,043 feet. Formation tests did not indicate any shows of oil. A test of sandstone below 4,708 feet gave a gas flow rate of 31 MMCF/D. The well has now been abandoned.

In the Gulf of Papua, Camelot Nominees Pty. Ltd. is undertaking a marine seismic survey as an initial step in the exploration of its off-shore tenement area.

MONAZITE

The Australian Atomic Energy Commission, which until recently has been obtaining supplies of monazite on the basis of tenders submitted by producers, has purchased no monazite in the current fiscal year pending a re-appraisal of Australian reserves of monazite and future domestic requirements of thorium.

Renewed overseas interest is being shown in Australian monazite as a source of rare earths. The market for rare earths continues to develop, but only slowly. The main reason advanced for the slow development of new uses for rare earths has been the increased cost of rare earth extraction. Formerly the United States Government was buying thorium, and rare earths were produced cheaply as a by-product of thorium production. With the cessation of United States stockpiling of thorium, cost of rare earth production has risen sharply.

OPAL

period of 1959. In particular Japanese purchases have greatly increased and amounted to £474,000 or over 62 per cent of the total; the Federal Republic of Germany and the United States were next in import-

ance with purchases exceeding £137,000 and £79,000 respectively.

It is reported that opals have been discovered on Helen Springs Station about 90

miles north of Tennant Creek (Northern Territory). Opal has been known in the district for some time, stones having been found by aborigines.

SULPHUR

Sulphuric acid production during 1960 reached the record figure of 1,109,751 monoton, compared with 1,000,452 monoton in 1959 and 1,009,034 monoton in 1958. 50.5 per cent of the 1960 production was derived from indigenous raw material.

Production of superphosphate, which absorbs about 75 per cent of acid produced, increased to a record level of 2,450,329 tons in 1960.

Imports of elemental sulphur for the third quarter were 83,226 tons; the total for the first three quarters of 1960 was nearly 33 per cent higher than in the corresponding period of 1959. The average f.o.b. prices of sulphur from the United States and Mexico in the third quarter were £10/8/6 per ton and £9/10/2 per ton respectively. Comparable prices for sulphur imported from the same countries in the second quarter of 1960 were £10/8/7 per ton and £10/5/3 per ton respectively.

The Tariff Board recommendations in respect of sulphuric acid and iron pyrites production were tabled in Parliament on 30th November, 1960. The Board recommended in effect:

- (1) An extension of the bounty for another five years;
- (2) Separate bounties for iron pyrites and sulphuric acid produced from it; and
- (3) That no bounty be paid on acid produced from lead sinter gas.

The Board proposed alternative bounty rates of £3 or £5/4/- a monoton of sulphuric acid, either of which could be adopted in the light of what was considered to be the obligations of Government to the producers. The lower rate measured the average cost disability of producers and the higher rate the disability of the highest cost producer. Similarly, basic rates of either £3 or £7 a ton were proposed for iron pyrites, with the same criteria in mind.

The new Sulphuric Acid Bounty Act 1960 and the Pyrites Bounty Act 1960 embody all the recommendations of the Board and where alternative bounty rates were suggested the lower, that is, the rate which is based on the average disability of producers, has been adopted.

TIN

Mine production of tin in the third quarter of 1960 was 509 tons compared with 653 tons and 374 tons in the first and second quarters respectively. Production in Queensland during the second and third quarters was lower than normal because of the temporary cessation of operations of the Tableland Tin dredge. The dredge was recommissioned towards the end of the third quarter. It is expected that Australian production in the final quarter of 1960 will show some im-

provement on the rate established in the first nine months of the year but it is unlikely that production for the year will reach the level of 2,350 tons recorded in 1959.

Production of refined tin in Australia in 1960 was 2,271 tons, slightly above the level recorded in 1959.

Preliminary statistics available at the end of November, 1960, show imports of refined tin in the eleven months ending November to have been 1,251 tons, somewhat higher

than the total for 1959 and significantly higher than imports in the preceding years. The substantial increase in tin imports has been necessary to provide for the growing shortfall between domestic production and consumption consequent on increased usage in the production of tinplate.

The price of tin in Australia is based upon that ruling in the Singapore market with an adjustment for freight and other charges. The maximum average monthly price for tin in Australia was £1,060 per ton in August, but thereafter there was a slight downward trend and the December average was £1,036. The situation was virtually unchanged in January, the average price for the month being £1,029. However, during February the trend was reversed and the average price for the month was £1,040.

On the London Metal Exchange there was a downward trend in price from July, 1960, when the peak price for the year, £stg.823 per ton, was recorded. The trend continued into January, 1961, when the price fell slightly below £780 per ton (the level at which the Buffer Stock Manager is again

permitted to buy tin). However, with possibility of consumption running ahead of available new metal in 1961, the price trend reversed and towards the end of February it was above £800.

The International Tin Council did not reimpose quotas on producer members of the Agreement for the first quarter of 1961. There was also no control in the last quarter of 1960. Stocks of metal held by the Buffer Stock Manager as at the end of September were unchanged at 10,030 tons.

Early in January the Council announced that the following countries had signed the Second International Tin Agreement which is due to become operative as from 1st July, 1961 — Australia, Austria, Belgium, Bolivia, Canada, Congo Republic (Leopoldville), Denmark, France, India, Indonesia, Italy, Japan, Federation of Malaya, Mexico, Netherlands, Nigeria, Ruanda-Urundi, Spain, Thailand, Turkey and the United Kingdom. These signatures more than fulfil the minimum requirements which are laid down in the Second Agreement as a necessary step towards its ratification.

TITANIUM

Rutile: Domestic production of rutile in the third quarter of 1960 was 23,537 tons; production for the year is likely to have been about 90,000 tons, compared with 81,905 tons in 1959. Annual shipments for rutile from Western Australia continued to be limited to several hundred tons.

The market for spot material continues to be very restricted; the current spot price is about £23-£24 per ton f.o.b. However, recently more frequent enquiries are being received from foreign buyers concerning future long-term contracts.

Ilmenite: Shipments of ilmenite from Western Australia in the third quarter of 1960 were sharply to 53,266 tons; this brought

shipments for the January-September, 1960, period to 91,850 tons. Some 22,500 tons of this total were despatched to Australian Titan Products Pty. Ltd., the sole Australian producer of titanium dioxide, operating at Burnie (Tasmania). Ilmenite exports in 1960 were expected to be approximately 75,000 tons, compared with 68,649 tons in 1959. However, prices remained low and ilmenite continued to be nominally quoted at less than £4 per ton f.o.b.

Titanium metal: Shipments of titanium mill products in the United States were reported to total 5,000 short tons in 1960, 50 per cent up on 1959 shipments, and second only to the record 5,650 short tons achieved in 1957.

TUNGSTEN

Production of tungsten concentrates during the first three quarters of 1960 was 1,135 tons. Included in this total were 902 tons of wolfram concentrates, practically all of this produced at the Storey's Creek and Aberfoyle mines, Tasmania. With the treatment plant of King Island Scheelite (1947) Ltd. working on a three-shift, five-day-week basis, output of scheelite concentrates (65% WO₃) for the third quarter was raised to 131 tons, bringing total output of scheelite concentrates during the first three quarters of 1960 to 234 tons. Preliminary trade statistics indicate that exports of tungsten concentrates in 1960 totalled 913 tons of wolfram concentrates valued at £615,720 f.o.b. and 505 tons of scheelite concentrates valued at £285,015.

URANIUM

Production of uranium oxide at Mary Kathleen (Queensland) was 359,000 lbs. in the final quarter of 1960, bringing total output of the mine in 1960 to 1,472,000 lbs. Combined uranium oxide production from Rum Jungle and the South Alligator River (Northern Territory) totalled 203,560 lbs. during the third quarter of 1960. On this basis it is estimated that domestic output of uranium oxide in 1960 totalled 1,000 tons, exclusive of South Australian production, data for which are not available.

It was announced in mid-January, 1961, that extensive drilling operations carried out in the Rum Jungle area during the last eighteen months had proved a new, high-grade uranium deposit in that area. At present operations at Rum Jungle are confined to the treatment of stockpiled ore.

It has been announced that no applications for grants of rewards for uranium deposits discovered after 31st March, 1961, will be considered by the Australian Atomic Energy Commission.

Although the overseas tungsten market ended 1960 on a firm note, the sale of significant quantities of discount material in the New Year resulted in a price fall of 3/- per unit to stg.145/- 150/- for wolfram 65% c.i.f. Europe. By the end of January prices had eased still further to 141/- 146/- per unit, and at the end of February 128/6-133/6 per unit was quoted.

Preliminary statistics issued by the U.S. Bureau of Mines show that U.S. consumption of tungsten ore in 1960, at 5,500 short tons of contained metal, was the highest since 1951. However, with domestic production up to 3,500 short tons of contained metal, tungsten ore imports were the lowest since 1940 — 1,600 short tons of contained metal, of which Australia supplied an estimated 23 per cent.

The United States Atomic Energy Commission has announced that in the five-year period commencing 1st January, 1961, it will purchase 18,900 short tons of uranium oxide from the South African Atomic Energy Board. Previously South African uranium was purchased by the Combined Development Agency. The new contract will be at a fixed price, averaging approximately \$11.20 per pound U₃O₈ f.o.b. or about 60 cents per pound less than the price paid during 1960 by the C.D.A. The United Kingdom also has negotiated a contract with South Africa providing for a stretch-out through to 1970 of a large part of the purchases of concentrates it was obliged to make under the C.D.A. agreement in the period 1961-1966. In line with these revised contracts it is reported that the South African uranium industry will be rationalised, with production being transferred from high-cost mines to low-cost mines as part of the new price arrangements and some high-cost mines being closed down.

ZINC

The steep fall in mine production in 1958 and 1959 from the peak level of 292,000 tons in 1957 was sharply arrested in 1960 when output for the year was 291,000 tons. The substantial increase during the year was mainly from Broken Hill but increases were also recorded at Captain's Flat (New South Wales) and Mt. Isa (Queensland); production at Read-Rosebery (Tasmania) was at a somewhat lower level. During the year producers were not subject to any of the restraints on production or sales which had operated during the second half of 1959.

The steady expansion in production of refined zinc at Risdon (Tasmania) was maintained in 1960 and production for the year was 120,000 tons, a new record. Domestic consumption as measured by despatches to consumers was at a record level of 90,000 tons; despatches in 1958 and 1959 were 73,000 tons and 79,000 tons respectively.

Exports of zinc concentrates (zinc content) and metal for the year were 170,000 tons and 29,000 tons respectively; a proportion of the concentrate exports were from accumulated stocks.

The overall world zinc situation will again be reviewed at the third session of the International Lead-Zinc Study Group to be held in Mexico City late in March. On the assumption that zinc will not be subject to any control it would appear at the moment that Australian mine production for 1961 will be at a slightly higher level than in 1960. However, the final picture will not be clear until the outcome of the Study Group meeting is known and to what extent, if any, there will be a further agreement to limit lead production (which will probably affect zinc production).

Production of refined zinc in Australia should show a significant increase in 1961. Output at Risdon will be increased and the new smelter at Cockle Creek is scheduled to come into operation during the second half of the year.

The price of zinc in Australia is related to that on the London Metal Exchange, with deductions for freight and other charges. The maximum price recorded in the last quarter of 1960 was £112½ per ton early in November and the minimum was £101½ per ton at the end of December. The downward trend continued in London in January and the Australian price was held for some time at £100 per ton. With the improvement in London about the end of the month and into February the domestic price rose slightly.

In London the minimum price for 1960, £stg.76½ per ton, was recorded on 29th December. The generally weaker tone reflected in particular the possibility of some cut-back in consumption and also the continued high level of exports from the United States, where consumption was well below expectations for the year. Early in 1961 there was a reversal in the price trend although the increase was moderate only.

The price of zinc in the United States which had stood at 13 cents per pound since early in January, 1960, fell to 12.5 cents in mid-December and to 12.0 cents later in the month. There was a further reduction to 11.50 cents early in January, 1961. The sharp fall in price in the United States was not unexpected in view of the relatively low level of consumption and the accumulation of stocks in that country. For a considerable period United States production was affected by strikes and with the settlement of these and the prospect of increased tonnages coming into the market the price break came in December.

By and large the overall world zinc situation during 1960 was particularly sound, although the general picture was overshadowed to some degree by the relatively low rate of consumption in the United States; consumption in Europe, Japan, Australia and India was very buoyant indeed. On balance there was some accumulation of

zinc stocks during the year, most of this in the United States. In the second half of the year stocks were depleted to some extent, partly as a result of strikes affecting some United States producers. This, however, was offset to some extent by the disposal of metal from the United Kingdom stockpile. In January, 1961, stocks in the United States had risen again and four smelters have since announced production cuts.

ZIRCONIUM

Production of zircon from the east coast during the third quarter of 1960 was 26,147 tons, total production for the January-September period being 74,876 tons. Shipments of zircon from Western Australia in the third quarter of 1960 were 523 tons making total shipments of zircon from that source for the first three quarters of 1960 3,268 tons. Preliminary figures indicate that zircon exports in 1960 totalled 105,000 tons, compared with the record total of 108,820 tons in 1959.

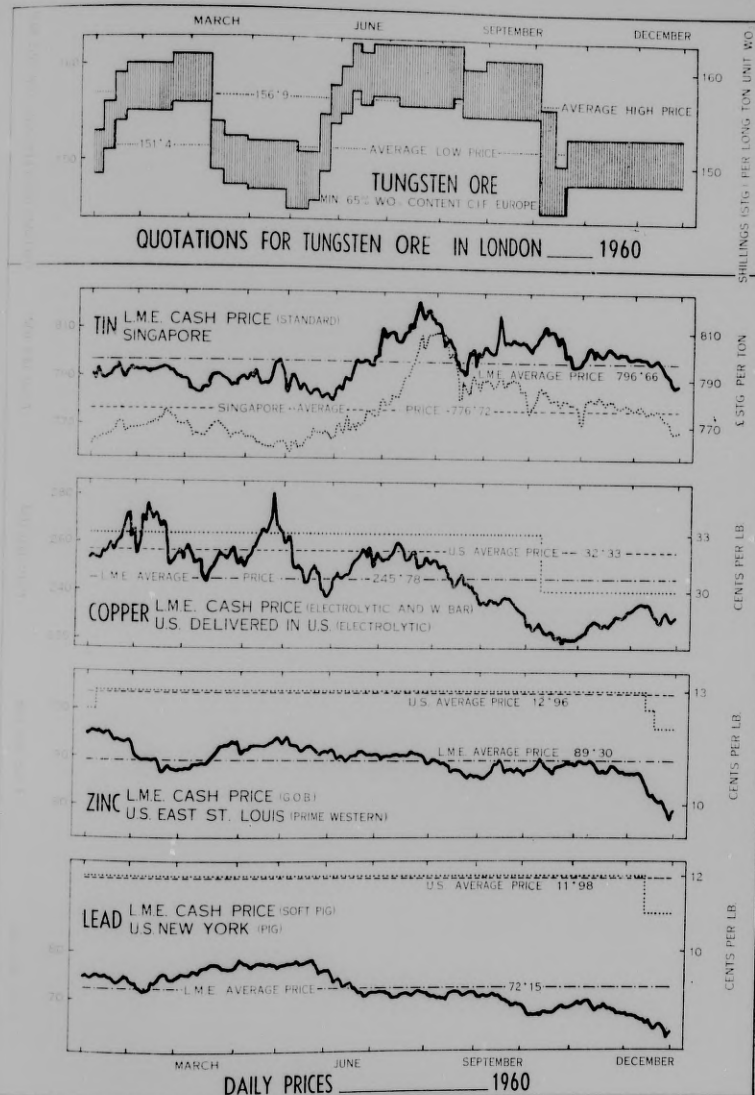
The outlook for 1961 will, of course, be largely influenced by the level of consumption in the United States. If there is no marked improvement in this market and there is some levelling off in consumption in Europe then on balance the position might develop into one of considerable oversupply. The level of mine production will, of course, be an important factor at least later in the year.

According to the U.S. Bureau of Mines, U.S. production of zirconium sponge in 1960 was 1,425 short tons, 3.5 per cent higher than in 1959. However, imports of zircon decreased by one-third to 36,000 short tons, mainly because of a decrease in imports from Australia; imports from South Africa and Nigeria remained constant. It is interesting to note that whereas the price of Australian zircon is quoted at \$50 per long ton c.i.f. Atlantic ports, high-hafnium zircon from Nigeria is quoted at \$150 per ton.

CORRIGENDUM

In the Australian Mineral Industry 1959 Review (p. 105, Table 3) incorrect figures were given for production of lead in all mine products by Broken Hill South Limited. The correct figures are (in tons):

In lead concentrates	In zinc concentrates	In other mine products	Total
25,460	574	—	26,034



METAL AND MINERAL PRICES

MONTHLY AVERAGE BASE METAL PRICES

	Aust.	U.K. Stg.	U.S.A. (a)	Aust.	U.K. Stg.	U.S.A. (a)
		COPPER			LEAD	
December	£305 7/-	£230 19 8	30.00	£100 -/-	£78 11 3	11.40
January	£305 -/-	£220 -/7	29.38	£100 -/-	£63 15 11	11.00
February	£305 -/-	£223 12 6	29.00	£100 -/-	£65 6 8	11.00
		ZINC			TIN	
December	£107 1 1	£82 15 3	12.50	£1,036 8 -	£795 9 -	101.700
January	£100 4 6	£79 4 8	11.55	£1,029 8 -	£783 12 5	100.542
February	£103 17 11	£82 15 3	11.50	£1,040 1 -	£792 16 6	101.105

MAXIMUM AND MINIMUM SPOT METAL PRICES, 1st DECEMBER, 1960-28th FEBRUARY, 1961

	Max.	Min.	Max.	Min.	Max.	Min.
	Australia		U.K. Stg.		U.S.A. (a)	
Copper	£309 -/-	£301 -/-	£234 12 6	£216 7 6	30.00	29.00
Lead	£100 -/-	£100 -/-	£66 18 9	£61 17 6	12.00	11.00
Zinc	£110 2 6	£99 15 -	£86 3 9	£76 12 6	13.00	11.25
Tin	£1,063 -/-	£1,027 -/-	£804 15 -	£79 15 -	102.500	100.250

METAL PRICES AS AT 1st MARCH, 1961

	Australia	U.K. Stg.	U.S.A. (a)
Aluminium	(d)£233 1 per ton nom. (e)£271 per ton	£186 per ton	(f)23.25
Antimony	(i)£296 per ton	(i)£217 1 per ton	(j)32.59
Bismuth	£1/10/3 per lb.	16/- per lb.	\$2.25
Cadmium	14/3 per lb.	11/- per lb.	\$1.60
Cobalt	—	12/- per lb.	\$1.50
Copper	(b)£305 per ton	£226 2 6 per ton	(c)29.00
Gold, per fine oz.	£15/12/6	£12 0 11	\$35.0
Lead	£100 per ton	£63 16 3 per ton	11.00
Mercury	—	£69 per flask	\$206.209 per flask, domestic, f.o.b.
Nickel	7/7 1 per lb. lots over 5 cwt. 8/- per lb. lots over 5 cwt.	£600 per ton	(g)70.00
Pig Iron	£21 3/- per ton	£20/18/3 per ton	\$66.67 per ton
Silver, per fine oz.	8/6	6/7 1	91.375 cents
Platinum, per fine oz.	—	U.K. and Empire refined £301 Imported £271-£281	\$81.85
Tin	(h)£1,054 per ton	£802 15/- per ton	101.375
Zinc	£106/12/6 per ton (electro)	£83 17 6 per ton (g.o.b.)	11.50 (Prime Western)

(a) Cents per lb. unless otherwise stated. (b) Price ex smelters, Port Kembla. (c) Domestic. (d) Imported. c.i.f. (e) Domestic 1-20K ingots, 99.5% c.i.f. capital cities. (f) Canadian price f.o.b. Toronto. (g) Canadian price f.o.b. Port Colborne. (h) 5 ton lots, delivered Sydney. (i) 99.6% Sb. (j) 99.5% Sb.

ORE AND CONCENTRATE PRICES AT 1st MARCH, 1961

	Australia	U.K. Stg.	U.S.A.
Antimony	20/- per unit 60% Sb. 26/- per unit 60% Sb. (Prill Ore)	24 - 26/- per unit 60% Sb.	Nom. per s. ton unit 60% \$3.45 - \$3.50. 65% lump \$3.60 - \$3.65.
Beryl	£13 10/- per unit BeO. f.o.b. nominated stores in Capital Cities.	220/- - 230/- per unit f.o.b. min. 10% BeO.	Domestic, f.o.b. mine or mill \$46-\$48 per s.t.u.; imported, spot, c.i.f. U.S. ports \$32-\$33 nom.
Bismuth	—	8/6 per lb. c.i.f. metal content 65% concen- trate.	
Chromium Ore	Nom.	£15/5/- per ton, 48% metallurgical or c.i.f., 3:1 ratio.	Rhodesian ore 48% long ton, f.o.b. cars New York, Cr ₂ O ₃ 3:1 ratio, \$35.75-\$36.25 (nom.), 48% Cr ₂ O ₃ , no ratio, \$27-\$28 (nom.).
Columbite	—	65% combined oxides, high grade c.i.f., 170/- - 175/- per unit.	\$1.18-\$1.25 per lb. pentoxide, 10:1 ratio.
Manganese	Metallurgical Ore £12 per ton f.o.b. Geraldton. Battery grade £30 per ton f.o.b., N.S.W. rail- way siding for 75% MnO ₂ . Queensland ore, battery grade, 75-80%, £35 per ton c. & f. Sydney.	58-5 11 per unit, 46% ore, c.i.f. European ports.	\$87.5-90 per long ton unit nom. 46-48% ore, c.i.f. U.S. ports, import duty extra.
Molybdenum Ore	Nom.	8/11 per lb. metal, contained in 85% MoS ₂ , f.o.b. Climax, Colorado.	\$1.25 per lb. contained Mo, f.o.b. mines.
Rutile	£23-£24 per ton, f.o.b. nom.	£26 per ton c.i.f. 95-97% TiO ₂ cons.	\$80 per s. ton of 94% TiO ₂ for delivery within 12 months (nom.).
Ilmenite	£4 per ton, f.o.b. nom.	£7-£7 1 per ton 52-54% TiO ₂ , c.i.f.	\$23.00-\$26.00 per ton, 59.5% TiO ₂ , f.o.b. Atlantic (E. & M. J.).
Tantalite	Nom.	£50-£60 per unit, 60% Ta ₂ O ₅ , c.i.f.	—
Tin	£8 1/-£8 1/2 per unit of metal delivered Sydney.	—	—
Tungsten	152 - 158 per unit.	125 - 130 - per unit, c.i.f. Europe.	\$16.25-\$16.75 s.t.u. for- eign duty \$7.93 ext.
Zircon	£11-£13 per ton 66-67% ZrO ₂ cons.	£15/15/- per ton 66- 67% ZrO ₂ cons. c.i.f.	\$50 per long ton, 65% ZrO ₂ cons.

Note: Some Australian ore prices are nominal and are subject to negotiation between the producer and purchaser.

The ore and concentrate prices quoted above will vary according to grade and, in many cases, to the size of the ore parcel.

Copper Ore.

Australia: The price paid for ores is related to the market price of copper, less charges listed below. The basis of price determination is variable; details are obtainable from individual smelters.

Company	Draught or Copper Content Deduction	Receiving, Sampling, Assaying & Smelting Charge per ton of ore	Converting, Refining, Realising Charge per unit of copper paid for	Gold Refining Charge per oz. of gold paid for	Silver Refining Charge per oz. of silver paid for
E.R.S. (1)	1.3 unit of copper per ton of ore.	£7/7/6	11/6	15/-	4/5
Mt. Isa (2)	1.3 unit of copper per ton of ore.	£5/5/-	14/-	No payment for gold and silver	
Mt. Morgan (3) (4)	1% of weight of ore plus 1.3 units of copper per ton of ore.	£6/-/-	20/-	17/-	5/-

- (1) The Electrolytic Refining and Smelting Company of Australia Pty. Ltd., Port Kembla, N.S.W.
 (2) Mt. Isa Mines Ltd., Mt. Isa, Queensland.
 (3) Mt. Morgan Ltd., Mt. Morgan, Queensland.
 (4) Mt. Morgan gold and silver deductions:—Gold, deductions range from 1 dwt./ton for 10 dwt./ton and lower grade ore to 1 dwt./ton plus 5% of the balance for 12 dwt./ton and over ore; silver, 1 oz./ton plus 10% of the balance.

INDUSTRIAL MINERAL PRICES AS AT 1st MARCH, 1961**Asbestos.**

W.A. Crocidolite, export price, f.o.b. Fremantle.
 £98-110 per short ton according to quantity.

Barite.

Crude: £11 per ton, f.o.r. Hawker, South Australia.

Fluorspar.**Buying.**

90% CaF_2 f.o.r. Nearest Queensland rail siding—£11 2/6 per ton.
 85% CaF_2 f.o.r. Nearest Queensland rail siding—£9 17/6 per ton.
 With unit variation of 2/6 from the 85% or 90% basis.

Selling.

90% CaF_2 delivered Sydney—£29/12/6 to £32/2/6 per ton.
 85% CaF_2 delivered Sydney—£27/12/6 to £30/2/6 per ton.

Gypsum.**Selling.**

In bulk f.o.r. Conoble, N.S.W.—42/- per ton.

Sillimanite.**Selling.**

£8/10/- per ton f.o.r. Olary, South Australia.

**Commonwealth Bureau of Census and Statistics,
 Canberra, Australia**

**THE
AUSTRALIAN MINERAL INDUSTRY**

VOL. 13. No. 3

PART 2 — QUARTERLY STATISTICS

QUARTER ENDED 30th SEPTEMBER, 1960

Prepared under instructions from the Right Honorable the Treasurer

by

S. R. CARVER

Commonwealth Statistician

PREFACE

Statistics included in this Part relate to Australian production of and oversea trade in minerals and mineral products. In the main, the data relating to mineral production consist of official statistics of Mines Departments of the several States and of the Northern Territory Mines Branch. These statistics have been supplemented as necessary by data obtained from the Bureau of Mineral Resources, including information collected by that Bureau from mines and treatment plants.

The fundamental provision of the uniform plan evolved in 1950 for standardization of Australian mineral production statistics is that quantities and values of individual minerals produced should be reported in terms of the products in the form in which they are dispatched from the locality of each mine. This involves the inclusion in the mining industry of ore-dressing and elementary smelting of metallic minerals (e.g., in the case of gold) and miscellaneous treatment of non-metallic minerals where these operations are carried out in an associated plant at or near the mine. For example, in the case of a metal mine, the output is recorded as ore when no treatment is undertaken at the mine or as a concentrate where ore-dressing operations are carried out in associated works in the locality of the mine.

The particulars of quantities of minerals produced shown in Table 4 have been compiled on this basis as far as practicable. This has involved some re-arrangement of official statistics published by Mines Departments for certain States. Actual output of the mineral product (as defined in the preceding paragraph) has generally been reported, but in some cases it has been necessary to include dispatches from the mine (or sales) as distinct from production in deriving the total for Australia. In addition to the basic quantity data, particulars of contents of metallic minerals have been shown in detail in Tables 4 and 5 and in summary form in Table 6. In general, the particulars of content of metallic minerals represent total contents (as determined by assay) for each metal which is a "pay metal" or "refiners' prize" when present in the particular mineral. The data in Table 4 exclude construction materials (sand, gravel, building stone, etc.), and some particulars for non-metallic minerals which are not at present available. In Table 6 particulars of producing States as well as totals for Australia are shown.

Principally because of time lags in treatment of a number of important metallic minerals, it has been found impracticable, under Australian conditions, to obtain satisfactory information as to the value of minerals produced, on a **quarterly basis**. Statistics of (i) value of output and of production of the mining and quarrying industries, (ii) value of individual minerals produced, (iii) value of imports and of exports of principal minerals and mineral products on a **calendar year basis**, and (iv) value of smelter and refinery production on a **fiscal year basis**, appear as a supplement to the first issue of this Bulletin each year.

In the presentation of the tables the following terms and symbols have been used:—

ton:	long ton of 2,240 lb.	(—): nil.
short ton:	ton of 2,000 lb.	(.): less than half the unit shown.
unit:	22.4 lb.	(n.a.): not available.
*	subject to revision.	(†): estimated or partly estimated.

All tables in this publication omit particulars relating to uranium bearing minerals.

I extend my thanks to State Departments of Mines, Statisticians of the several States, and the Bureau of Mineral Resources who have supplied information used in the preparation of this Bulletin.

S. R. CARVER,
Commonwealth Statistician

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I. SUMMARY TABLES

TABLE 1—MINE PRODUCTION OF PRINCIPAL MINERALS: AUSTRALIA

Mineral	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
Metallic contents—							
Copper	ton	54,547	59,255	75,715	94,699	29,287	83,984
Lead	"	299,485	333,753	328,347	316,294	76,130	229,258
Zinc	"	278,082	291,582	263,044	248,778	71,518	211,362
Tin	"	2,078	1,952	2,237	2,350	509	1,536
Gold	'000 f. oz.	1,030	1,084	1,104	1,085	275	801
Silver	"	14,610	15,789	16,305	15,076	3,874	11,436
Iron (a)	'000 tons	12,543	12,466	12,544	12,706	1682	12,083
Manganese ore—							
Metallurgical (Mn. content)	ton	25,856	34,904	25,623	40,672	6,773	21,152
Battery and other (MnO ₂ content)	ton	1,464	1,239	2,819	2,474	411	1,079
Rutile (TiO ₂ content)	"	93,242	124,863	80,955	79,624	22,826	65,351
Ilmenite (TiO ₂ content)	"	2,260	38,888	38,278	45,872	29,927	51,258
Tungsten concentrates (WO ₃ content)	ton	1,582	1,409	850	653	208	738
Black coal	'000 tons	19,274	19,919	20,442	20,298	6,246	16,851
Brown coal	"	10,560	10,741	11,644	13,035	4,147	11,262

(a) Excludes iron content of iron oxide not intended for metal extraction or fluxing.

TABLE 2 — SMELTER AND REFINERY PRODUCTION OF PRINCIPAL METALS: AUSTRALIA

(Excludes secondary metal (i.e., metal recovered from scrap) unless otherwise specified).

Metal	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
Aluminium (refined)	ton	9,143	10,624	10,869	11,370	2,957	8,656
Cadmium (refined)	"	276	393	353	340	72	229
Copper (blister) (b)	"	49,030	50,403	64,608	68,494	20,086	53,900
Copper (refined)	"	29,307	32,880	43,276	51,545	16,610	51,599
Gold (refined)—							
Australian origin	'000 f. oz.	1,044	1,078	1,070	1,067	245	785
Total	"	1,205	1,250	1,207	1,209	286	902
Lead—							
Refined (c)	ton	194,506	192,161	191,474	185,805	48,563	143,810
Lead cont. of lead-silver bullion for export	ton	41,658	46,891	57,171	50,310	13,674	39,258
Total	"	236,164	239,052	248,645	236,115	62,237	183,068
Pig iron (d)	'000 tons	2,074	2,208	2,270	2,503	734	2,098
Steel ingots (d)	"	2,539	3,016	3,133	3,382	951	2,716
Silver (refined)	'000 f. oz.	8,232	8,011	9,101	7,822	2,077	5,888
Tin (refined)	ton	1,850	1,806	2,121	2,226	498	1,628
Zinc (refined slab) (e)	"	104,993	110,348	114,773	116,461	30,840	88,801

(a) Production commenced September. (b) Total production for refining in Australia and overseas. (c) Includes lead content of antimonial lead. (d) Includes recovery from scrap. (e) Includes small quantities of metal recovered from zinc dust used in works.

Note: Particulars of refined aluminium, cadmium, copper, lead, silver, tin and zinc in Table 2 were collected by the Bureau of Mineral Resources.

TABLE 3—SUMMARY OF PRODUCTION, IMPORTS AND EXPORTS OF PRINCIPAL MINERALS AND MINERAL PRODUCTS: AUSTRALIA

(Note: Particulars of production of refined metals exclude secondary metal (i.e., metal recovered from scrap) unless otherwise specified).

Particulars	1956	1957	1958	1959*	1960*	
					July-Sept.	Jan.-Sept.
ALUMINIUM (Tons)						
Production—						
Bauxite (Al ₂ O ₃ content)	4,618	3,758	3,533	3,639	1,261	2,975
Alumina	16,863	20,116	22,490	26,900	7,020	20,794
Refined aluminium	9,143	10,624	10,869	11,370	2,957	8,656
Imports—						
Bauxite (Al ₂ O ₃ content)	121,229	124,966	138,419	136,910	113,052	141,139
Refined aluminium (c)—						
Ingots	10,223	8,374	14,813	19,268	6,839	20,026
Rolled, drawn and extruded shapes (d)	2,700	2,797	2,827	2,719	1,481	4,968
Foil	1,938	2,193	2,409	2,788	955	2,910
Powder	564	531	486	670	126	477
Exports—						
Refined aluminium (c)—						
Ingots	4	762	—	78	2	15
Rolled, drawn and extruded shapes (d)	30	83	135	162	125	226
COPPER (Tons)						
Production—						
Copper cont. of minerals produced	54,547	59,255	75,715	94,699	29,287	83,984
Blister copper (e)	49,030	50,403	64,608	68,494	20,086	53,900
Refined copper	29,307	32,880	43,276	51,545	16,610	51,599
Imports of refined copper—						
Ingots	250	4,251	659	3,479	875	1,650
Rolled, drawn and extruded shapes (d)	2,063	2,031	2,289	1,189	1,080	2,239
Exports—						
Copper cont. of ores, concentrates, matte, etc.	6,580	6,873	7,272	20,094	8,961	24,210
Blister copper	15,574	19,131	14,421	16,217	—	502
Refined copper—						
Ingots	1,002	1	—	2,749	3,610	8,774
Rolled, drawn and extruded shapes (d)	1,581	1,216	1,365	1,121	517	1,308
GOLD (Fine oz.)						
Production—						
Gold content of minerals produced	1,029,821	1,083,941	1,103,980	1,085,119	274,861	800,501
Refined gold—						
Australian origin	1,044,164	1,078,419	1,069,774	1,067,129	245,351	785,103
Overseas origin	161,065	171,970	136,998	141,624	40,168	116,431
Total refined gold	1,205,229	1,250,389	1,206,772	1,208,753	285,519	901,534
Imports—						
Bullion, other crude forms	201,871	159,998	160,232	136,674	35,267	115,549
Refined gold	12	—	—	—	—	—
Exports—						
Gold content of ores and concentrates	18,177	19,561	22,453	17,941	4,432	16,164
Bullion, other crude forms	42	—	—	—	—	—
Refined gold	530,968	783,814	128,350	128,052	321,949	925,573
Net industrial absorption	37,052	42,887	37,568	43,001	12,937	37,947
Change in stocks of gold held in Australia (f)	4,645,465	2,307,677	1,075,641	1,032,790	29,190	63,634

(a) Production commenced February. (b) Production commenced September. (c) Includes aluminium-base alloys. (d) Excludes wire. (e) Total production for refining in Australia and overseas. (f) Excludes specie; includes gold content of change in stocks of minerals awaiting refining.

TABLE 3—SUMMARY OF PRODUCTION, IMPORTS AND EXPORTS OF
PRINCIPAL MINERALS AND MINERAL PRODUCTS: AUSTRALIA — (Continued)

Particulars	1956	1957	1958	1959*	1960*	
					July-Sept.	Jan.-Sept.
IRON AND STEEL (Tons)						
Production—						
Iron content of iron ore (a)	†2,542,826	†2,465,523	†2,544,462	†2,705,855	†681,780	†2,082,912
Pig iron (b)	2,074,467	2,208,140	2,279,282	2,503,456	734,410	2,098,226
Ingot steel (b)	2,539,061	3,015,569	3,133,081	3,381,685	951,149	2,716,139
Blooms and slabs	2,190,889	2,473,901	2,668,571	3,070,889	875,549	2,490,692
Tinplate	—	(c) 15,453	69,066	80,234	25,900	75,503
Imports—						
Iron content of iron ore	†7,729	†111,656	†162,886	†144,047	†41,753	†110,188
Ferro-alloys	15,137	14,579	13,335	23,989	11,960	27,412
Angles and tees	28,369	4,684	4,023	14,032	12,648	30,580
Structural steel	54,134	12,574	10,592	17,253	23,636	51,736
Bars and rods	55,890	17,860	24,798	9,035	20,761	28,699
Hoop and strip	29,117	15,077	14,177	13,900	9,810	20,270
Tinplate	120,917	144,199	66,050	50,298	17,095	41,202
Plate and sheet (plain)	37,808	15,404	15,918	9,119	86,514	136,326
Exports—						
Pig iron	16,420	15,330	19,321	44,038	18,583	52,005
Ingots, blooms and slabs	1,747	2,327	728	12,972	193	9,609
Bars and rods	16,842	21,595	28,588	39,198	9,190	46,411
Angles and tees	4,138	8,160	5,786	6,138	1,979	6,368
Plate and sheet—						
Plain	61,070	143,629	85,444	141,313	19,102	55,592
Galvanized	38,484	86,378	58,938	58,488	15,782	44,119
Scrap	105,123	178,255	156,978	182,985	51,052	153,279
LEAD (Tons)						
Production—						
Lead content of minerals produced	299,485	333,753	328,347	316,294	76,130	229,258
Smelter production—						
Refined lead (d)	194,506	192,161	191,474	185,805	48,563	143,810
Lead content of lead-silver bullion for export	41,658	46,891	57,171	50,310	13,674	39,258
Total lead cont.	236,164	239,052	248,645	236,115	62,237	183,068
Exports—						
Lead content of ores, concentrates, etc.	54,818	70,736	64,606	67,718	19,464	43,842
Lead content of lead-silver bullion	37,923	47,241	57,661	52,650	13,142	36,877
Refined lead—						
Pigs	149,061	160,589	155,730	138,448	36,120	94,266
Rolled and extruded shapes (except wire, leaf and foil)	82	182	99	86	14	73
Antimonial lead	159	345	109	597	45	315
Scrap	10,708	8,372	5,152	1,390	241	817
MANGANESE ORE (Tons)						
Production—						
Metallurgical grade ore	57,329	75,214	55,536	86,087	13,784	44,264
Battery (incl. other) grade ore	2,055	1,796	4,147	3,414	605	1,550
Imports—						
Metallurgical grade ore	20	—	5	3	—	1
Battery grade ore	2,010	2,049	1,183	1,304	61	167
Exports—						
All grades of ore	2	30,061	18,399	31,812	14,019	33,932

(a) Excludes iron content of iron oxide not intended for metal extraction or fluxing. (b) Includes recovery from scrap. (c) Production commenced August. (d) Includes lead content of antimonial lead.

TABLE 3—SUMMARY OF PRODUCTION, IMPORTS AND EXPORTS OF
PRINCIPAL MINERALS AND MINERAL PRODUCTS: AUSTRALIA — (Continued)

Particulars	1956	1957	1958	1959*	1960*	
					July-Sept.	Jan.-Sept.
SILVER ('000 fine oz.)						
Production—						
Silver content of minerals produced	14,610	15,789	16,305	15,076	3,874	11,436
Refined silver	8,232	8,011	9,101	7,822	2,077	5,888
Imports—						
Bullion and other crude forms	102	77	75	78	16	57
Exports—						
Silver content of ores and concentrates	2,163	2,477	2,564	2,375	662	1,865
Silver content of lead-silver bullion produced for export	3,519	4,098	4,696	4,242	1,059	2,971
Refined silver	16,444	3,672	4,876	3,001	594	2,156
Unrefined bullion & matte	148	12	—	—	—	—
TIN (Tons)						
Production—						
Tin content of minerals produced	2,078	1,952	2,237	2,350	509	1,536
Refined tin	1,850	1,806	2,121	2,226	498	1,628
Imports—						
Refined tin, excl. leaf and foil	516	1,218	1,070	1,294	535	1,351
Exports—						
Tin content of ores, concentrates, etc.	63	134	29	41	1	2
Refined tin, excl. leaf and foil	24	21	11	9	3	14
TITANIUM (in terms of TiO ₂) (Tons)						
Ilmenite						
Production	2,260	38,888	38,278	45,872	29,927	51,258
Imports	†7,800	†265	—	—	—	—
Exports	†598	†20,665	†30,717	†37,468	†19,013	†32,533
Rutile						
Production	93,242	124,863	80,955	79,624	22,826	65,351
Exports	†86,569	†115,321	†73,462	†78,688	†21,467	†64,753
TUNGSTEN (WO ₃ content) (Tons)						
Scheelite						
Production	990	950	478	—	85	152
Exports	897	907	341	103	105	169
Wolfram						
Production	592	459	372	653	123	586
Exports	531	454	319	717	179	538
ZINC (Tons)						
Production—						
Zinc content of minerals produced	278,082	291,582	263,044	248,778	71,518	211,362
Refined slab zinc (a)	104,993	110,348	114,773	116,461	30,840	88,801
Exports—						
Zinc content of ores, concentrates, etc.	143,452	178,078	146,234	118,977	57,803	140,443
Refined zinc—						
Ingots and other refinery shapes	31,594	37,092	37,938	41,606	6,304	20,470
Plates, sheets, circles and strips	2,283	1,561	1,090	1,096	456	862
Scrap	527	414	269	344	64	640

(a) Includes small quantities of metal recovered from zinc dust used in works.

TABLE 3—SUMMARY OF PRODUCTION, IMPORTS AND EXPORTS OF
PRINCIPAL MINERALS AND MINERAL PRODUCTS: AUSTRALIA — (Continued)

Particulars	1956	1957	1958	1959*	1960*	
					July-Sept.	Jan.-Sept.
COAL ('000 Tons)						
Production—						
Black coal—						
Semi-anthracite	81	71	57	54	15	41
Bituminous	17,681	18,229	18,616	18,576	5,697	15,402
Sub-bituminous	1,512	1,619	1,769	1,668	534	1,408
Total black coal	19,274	19,919	20,442	20,298	6,246	16,851
Underground	17,124	17,888	18,377	18,602	5,598	15,254
Open cut	2,150	2,031	2,065	1,696	648	1,597
Brown coal (lignite)	10,560	10,741	11,644	13,035	4,147	11,262
Imports—						
Coal	5	9	6	8	1	5
Coke (incl. petroleum coke)	3	15	9	7	—	2
Exports—						
Coal	239	759	824	794	451	1,108
Coke	88	182	52	21	22	73

SULPHURIC ACID AND SULPHUR (Tons)

Production of sulphuric acid (mono-tons)	841,225	971,976	1,009,064	1,000,458	261,331	852,539
Sulphur in sulphuric acid (mono-) from—						
Sulphur (elemental)	146,816	156,413	162,881	153,195	41,273	140,890
Zinc concentrate	29,061	35,025	38,524	39,933	9,898	31,815
Lead concentrate	16,090	18,272	21,339	19,619	5,834	16,400
Pyrite	76,780	100,111	99,216	103,596	806	2,836
Spent oxide	4,643	4,744	4,301	3,655	79,601	79,601
Other materials	1,694	3,271	3,702	7,151	2,586	7,237
Total sulphur cont.	275,084	317,836	329,963	327,149	85,455	278,779
Imports—						
Sulphur (elemental)	202,977	120,277	202,421	170,770	83,226	180,939

ASBESTOS (Short tons of 2,000 lb.)

Production—						
Chrysotile	1,549	2,232	2,255	1,433	333	898
Crocidolite	8,160	12,438	13,313	16,442	4,461	10,856
Imports—						
Chrysotile	18,344	22,873	23,408	24,316	8,449	20,977
Crocidolite	65	165	311	328	51	74
Amosite	10,644	10,322	13,984	12,019	2,404	7,853
Other	525	528	1,185	1,667	626	1,597
Exports—						
Chrysotile	40	378	264	197	—	—
Crocidolite	7,579	10,892	10,049	12,684	1,851	20
Other	101	59	120	93	43	82

II. DETAILED TABLES

TABLE 4—QUANTITIES AND CONTENTS (OR GRADE) OF MINERALS PRODUCED:
AUSTRALIA

Mineral	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
METALLIC MINERALS							
Antimony ore	ton	1	2	2	1	1	3
Antimony content	"	1	1	1	1	1	3
Antimony concentrate	"	546	850	1,114	1,021	56	196
Antimony content	"	286	484	691	627	32	118
Bauxite	"	10,329	7,707	6,909	7,708	2,506	5,577
Al ₂ O ₃ content	"	4,618	3,758	3,533	3,639	1,261	2,975
Beryllium ore	"	318	395	247	317	32	164
BeO content	unit	3,768	4,570	2,900	3,592	396	1,909
Bismuth concentrate	lb.	1,232	—	3,310	—	—	—
Bismuth content	"	1629	—	2,328	—	—	—
Chromite	ton	6,096	3,049	776	120	—	—
Cr ₂ O ₃ content	"	2,624	1,420	1386	160	—	—
Copper ore (a)	"	47,209	56,447	58,109	79,683	16,519	47,746
Copper content	"	3,363	3,666	3,897	4,592	945	2,458
Gold content	f. oz.	1	1	37	—	—	—
Silver content	"	1,511	122	1,037	770	—	—
Copper concentrate	ton	205,304	222,168	279,976	358,783	116,278	334,146
Copper content	"	46,389	50,047	66,219	84,769	27,108	77,878
Gold content	f. oz.	56,908	71,202	77,506	97,350	21,340	66,283
Silver content	"	343,293	360,266	411,304	541,759	181,916	491,407
Copper precipitate	ton	134	557	1,536	1,350	245	836
Copper content	"	77	406	998	918	188	642
Gold content	f. oz.	—	—	310	—	—	—
Silver content	"	—	—	38	—	—	—
Gold ore	ton	—	10	—	—	—	—
Gold content	f. oz.	—	36	—	—	—	—
Gold concentrate	ton	107	949	1,855	1,487	—	42
Gold content	f. oz.	298	1,917	4,109	3,534	17	176
Silver content	"	219	356	492	4	18	95
Copper content	ton	—	—	—	—	—	—
Gold other forms (b)	oz.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Gold content	f. oz.	950,319	986,677	995,925	959,803	246,451	714,284
Silver content	"	205,169	193,319	196,778	195,473	49,201	140,643
Ilmenite concentrate	ton	4,274	71,155	69,948	83,807	53,662	92,753
TiO ₂ content	"	2,260	38,888	38,278	45,872	29,927	51,258
Iron ore (c)	"	3,923,985	3,805,473	3,925,524	4,150,293	1,055,676	3,218,966
Iron content	"	12,542,826	12,465,523	12,544,462	12,705,855	1681,780	12,082,912
Iron oxide	"	—	—	—	—	—	—
For gas purification	ton	6,479	5,338	2,864	4,174	495	2,033
For cement manufacture	ton	9,126	9,759	6,093	9,666	—	3,497
For coal washing	"	—	4	25	30	15	15
For fluxing	"	(d)	(d)	(d)	(d)	(d)	(d)
Lead ore (e)	"	20,121	20,758	21,854	13,237	2,300	4,610
Lead content	"	3,990	3,145	2,301	1,433	230	464
Zinc content	"	—	20	—	—	—	—
Silver content	f. oz.	474,629	393,896	94,757	31,018	8,268	18,327
Gold content	"	—	15	—	—	—	—
Lead concentrate	ton	475,731	497,404	492,908	460,563	111,807	337,140
Lead content	"	286,020	320,319	316,048	306,078	73,545	222,080
Silver content	f. oz.	12,241,159	13,475,649	14,200,130	13,061,589	3,282,205	9,774,716
Gold content	"	10,777	10,675	11,590	12,006	2,748	8,088
Antimony content	ton	616	724	664	652	158	472
Cadmium content	"	69	76	74	72	16	53
Copper content	"	3,462	3,770	3,270	3,320	699	2,016
Sulphur content	"	49,697	54,888	51,939	50,404	12,342	36,372
Lead-copper concentrate	"	6,315	7,366	7,630	6,010	1,822	5,326
Lead content	"	2,355	2,719	2,843	2,521	599	1,754
Copper content	"	537	633	666	486	160	461
Silver content	f. oz.	695,592	689,373	761,360	671,412	180,834	540,201
Gold content	"	8,308	10,123	10,001	8,432	3,270	8,660

(a) Includes cupreous ore for fertilizer. (b) Bullion, alluvial, retorted gold, etc. (c) Iron oxide for metal extraction. Includes iron oxide for fluxing. (d) Included with iron ore. (e) Includes lead-silver and lead-zinc ores.

TABLE 4—QUANTITIES AND CONTENTS (OR GRADE) OF MINERALS PRODUCED:
AUSTRALIA—(Continued)

Mineral	Unit of Quantity	1956	1957	1958	1959*	1960 ^a	
						July-Sept.	Jan.-Sept.
METALLIC MINERALS—(Continued)							
Manganese ore—							
Metallurgical grade	ton	57,329	75,214	55,536	86,087	13,784	44,264
Manganese content	"	25,856	34,904	25,623	40,672	6,773	21,152
Battery grade	"	692	767	974	1,409	249	695
MnO ₂ content	"	528	571	706	1,060	181	516
Other grades	"	1,363	1,029	3,173	2,005	356	855
MnO ₂ content	"	936	668	2,113	1,414	230	563
Molybdenite concentrate	lb.	224	6,160	10,080	—	—	—
MoS ₂ content	"	1,190	15,216	18,568	—	—	—
Monazite concentrate	ton	102	141	454	358	272	372
Monazite content	"	93	132	421	331	259	353
Osmiridium, native	oz.	25	67	42	3	—	—
Platinum concentrate	"	26	26	28	—	—	—
Platinum content	"	18	17	22	—	—	—
Osmiridium content	"	2	2	1	—	—	—
Palladium content	"	—	—	—	—	—	—
Gold content	1 oz.	—	1	—	—	—	—
Pyritic ore	ton	12,629	—	—	—	—	—
Sulphur content	"	4,444	—	—	—	—	—
Pyrite concentrate	"	171,859	229,125	226,744	223,004	52,573	164,318
Sulphur content	"	82,333	109,026	108,636	106,882	28,111	78,455
Gold content	1 oz.	(a)	(a)	(a)	(a)	(a)	(a)
Rutile concentrate	ton	96,816	128,903	83,328	81,905	23,537	67,202
TiO ₂ content	"	93,242	124,863	80,955	79,624	22,826	65,351
Tantalite-columbite concentrate	lb.	159,655	50,038	13,507	18,950	3,046	7,840
Ta ₂ O ₅ + Nb ₂ O ₅ content	"	85,690	23,499	6,736	8,499	1,473	3,057
Tin concentrate	ton	2,926	2,867	3,128	3,305	719	2,178
Tin content	"	2,078	1,952	2,237	2,350	509	1,516
WO ₃ content	"	—	—	—	—	—	—
Copper content	"	—	7	—	—	—	—
Tungsten concentrates—							
Scheelite	ton	1,495	1,449	733	1	123	219
WO ₃ content	"	990	950	478	—	85	182
Wolfram	"	877	656	517	903	169	803
WO ₃ content	"	892	459	372	653	123	589
Bismuth content	lb.	4,500	1344	—	—	—	—
Zinc ore, for fertilizer	ton	—	—	—	—	—	—
Zinc content	"	—	—	—	—	—	44
Zinc concentrate	"	530,777	556,763	503,752	473,276	135,833	400,693
Zinc content	"	278,082	291,582	263,024	248,778	71,518	211,355
Lead content	"	7,120	7,570	7,155	6,262	1,756	4,960
Silver content	1 oz.	648,350	675,650	638,674	576,338	171,784	470,804
Gold content	"	3,210	3,309	4,487	3,994	1,035	2,996
Cadmium content	ton	853	903	798	789	216	646
Cobalt content	"	59	68	71	60	16	50
Copper content	"	719	726	665	623	187	529
Manganese content	"	5,293	5,858	5,680	5,763	1,330	4,435
Sulphur content	"	168,714	177,529	160,976	151,737	43,462	128,521
Zircon concentrate	"	72,458	88,561	59,269	113,406	26,670	78,144
Zircon content	"	71,769	87,703	58,745	112,429	26,450	77,501
FUEL MINERALS							
Black coal—							
Semi-anthracite	'000 tons	81	71	57	54	15	41
Bituminous	"	17,681	18,229	18,616	18,576	5,697	15,402
Sub-bituminous	"	1,512	1,619	1,769	1,668	534	1,408
Total black coal	"	19,274	19,919	20,442	20,298	6,246	16,851
Brown coal (lignite)	"	10,560	10,741	11,644	13,035	4,147	11,262

(a) Included with gold—other forms.

TABLE 4—QUANTITIES AND CONTENTS (OR GRADE) OF MINERALS PRODUCED:
AUSTRALIA—(Continued)

Mineral	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
NON-METALLIC (Excluding Fuel) MINERALS							
Asbestos—							
Chrysotile, fibre and fines	short ton	1,549	2,232	2,255	1,433	333	898
Crocidolite, fibre	"	8,160	12,438	13,313	16,442	4,461	10,856
Barite	ton	6,009	9,778	6,802	6,214	1,698	7,583
Clays—							
Bentonite	ton	1,404	742	123	229	—	192
Bentonite clay	"	63	187	30	56	—	17
Brick clay and shale	"	†3,426,329	†3,531,140	†3,829,263	†4,295,625	†1,223,000	†3,241,535
Cement clay and shale (a)	ton	153,098	141,433	163,808	172,946	n.a.	n.a.
Damourite clay	"	472	650	482	491	n.a.	n.a.
Fireclay, n.e.i.	"	145,895	179,394	160,308	175,202	n.a.	n.a.
Fuller's earth	"	235	215	120	136	n.a.	n.a.
Kaolin (incl. ball clay)	"	41,089	43,486	37,099	36,974	n.a.	n.a.
Stoneware clay	"	123,267	111,999	119,680	101,186	n.a.	n.a.
Tile clay (a)	"	136,757	145,386	143,780	143,150	n.a.	n.a.
Other clays (a)	"	114,227	124,678	149,451	192,265	n.a.	n.a.
Diamonds, industrial	carat	383	312	158	37	n.a.	n.a.
Diatomite	ton	5,789	6,221	4,240	5,089	1,018	3,383
Dolomite	"	115,564	192,103	138,832	190,076	49,712	137,724
Felspar (inc. Cornish stone)	ton	18,629	8,819	7,016	6,756	2,098	6,019
Fluorspar (fluorite)	"	745	700	930	471	n.a.	n.a.
Average grade	% CaF ₂	n.a.	85	85	85	n.a.	n.a.
Garnet concentrate	ton	85	70	36	65	43	73
Gems—							
Opal	Value £A	124,626	184,949	216,266	446,020	n.a.	n.a.
Sapphire	"	691	20	1,813	2,792	n.a.	n.a.
Glaucanite	ton	85	126	112	102	—	36
Graphite—							
Flake	ton	1	—	—	—	—	—
Average grade	% Carbon	86	—	—	—	—	—
Amorphous	ton	9	—	—	—	—	—
Average grade	% Carbon	80	—	—	—	—	—
Gypsum	ton	463,355	478,436	504,938	516,791	151,248	430,005
Limestone (incl. shell & coral)	'000 tons	4,264	4,572	5,324	5,314	1,469	4,073
Loom, for foundry	ton	17,399	16,967	21,505	15,410	—	—
Moulding (a)	"	64,685	83,473	69,391	60,586	16,131	43,860
Magnesite, crude	"	—	—	—	—	—	—
Mica, muscovite—							
Trimmed	lb.	28,837	36,713	31,391	33,665	n.a.	n.a.
Crude and film	"	—	—	35,840	134,400	n.a.	n.a.
Serap	"	—	40,600	48,496	6,720	n.a.	n.a.
Mineral pigments—							
Red ochre	ton	390	60	252	163	110	125
Yellow ochre	"	118	47	31	15	16	—
Peat, for fertiliser	"	—	90	—	—	—	—
Pebbles, for grinding	"	698	746	970	900	182	n.a.
Perlite	"	339	—	300	708	—	—

(a) Incomplete; figures relate only to production reported by Mines Departments.

TABLE 4—QUANTITIES AND CONTENTS (OR GRADE) OF MINERALS PRODUCED: AUSTRALIA—(Continued)

Mineral	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
NON-METALLIC (Excluding Fuel) MINERALS—(Continued)							
Petalite	ton	—	—	68	—	—	—
Li ₂ O content	unit	—	—	285	—	—	—
Phosphate rock	ton	6,788	11,430	7,421	4,775	n.a.	n.a.
Pyrophyllite	"	339	358	267	347	53	127
Salt	"	408,689	427,600	429,534	454,863	n.a.	n.a.
Serpentine, for refrac- tories	ton	910	781	965	920	257	859
Silica (glass, chemical, etc.) (a)	ton	142,485	149,339	145,483	154,778	2,634	n.a.
Sillimanite	"	2,181	2,302	1,696	3,633	856	3,487
Slate, for filler	"	150	105	15	—	—	—
Talc (incl. steatite)	"	13,160	14,441	15,393	16,376	3,369	11,792
Vermiculite	"	1	—	—	—	—	—

(a) Incomplete; figures relate only to production reported by Mines Departments.

TABLE 5—CONTENTS OF METALLIC MINERALS PRODUCED: AUSTRALIA

Mineral in which contained	Contents of Metallic Minerals Produced					
	1956	1957	1958	1959*	1960*	
					July-Sept.	Jan.-Sept.
ALUMINA (Al₂O₃) (Tons)						
Bauxite	4,618	3,758	3,533	3,639	1,261	2,975

ANTIMONY (Tons)

Antimony ore	1	1	1	1	1	3
Antimony concentrate	286	484	691	627	32	118
Lead concentrate	616	724	664	652	158	472
Total	903	1,209	1,356	1,280	191	593

BERYLLIUM OXIDE (BeO) (Units of 22.4 lb.)

Beryllium ore	3,768	4,570	2,900	3,592	396	1,909
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TABLE 5—CONTENTS OF METALLIC MINERALS PRODUCED: AUSTRALIA—(Continued)

Mineral in which contained	Contents of Metallic Minerals Produced					
	1956	1957	1958	1959*	1960*	
					July-Sept.	Jan.-Sept.
BISMUTH (lb.)						
Bismuth concentrate	4,620	—	2,328	—	—	—
Wolfram concentrate	4,500	1,344	—	—	—	—
Total	5,120	1,344	2,328	—	—	—
CADMIUM (Tons)						
Lead concentrate	69	76	74	72	16	53
Zinc concentrate	853	903	798	789	216	646
Total	922	979	872	861	232	699
CHROMIC OXIDE (Cr₂O₃) (Tons)						
Chromite	2,624	4,142	4,386	460	—	—
COBALT (Tons)						
Zinc concentrate	59	68	71	60	16	50
COPPER (Tons)						
Copper ore (a)	3,363	3,666	3,897	4,592	945	2,458
Copper concentrate	46,389	50,047	66,219	84,760	27,108	77,878
Copper precipitate	77	406	998	918	188	642
Gold concentrate	—	—	—	—	—	—
Lead concentrate	3,462	3,770	3,270	3,320	699	2,016
Lead-copper concentrate	537	633	666	486	160	461
Tin concentrate	—	7	—	—	—	—
Zinc concentrate	719	726	665	623	187	529
Total	54,547	59,255	75,715	94,699	29,287	83,984
GOLD (Fine oz.)						
Copper ore	1	1	37	—	—	—
Copper concentrate	56,908	71,202	77,506	97,350	21,340	66,283
Copper precipitate	—	—	310	—	—	—
Gold ore	—	36	—	—	—	—
Gold concentrate	298	1,917	4,109	3,534	17	176
Gold—other forms (b)	950,319	986,677	995,925	959,803	246,451	714,289
Lead ore (c)	—	—	15	—	—	—
Lead concentrate	10,777	10,675	11,590	12,006	2,748	8,097
Lead-copper concentrate	8,308	10,123	10,001	8,432	3,270	8,660
Platinum concentrate	—	1	—	—	—	—
Pyrite concentrate	(d)	(d)	(d)	(d)	(d)	(d)
Zinc concentrate	3,210	3,309	4,487	3,994	1,035	2,996
Total	1,029,821	1,083,941	1,103,980	1,085,119	274,861	800,501

(a) Includes cupreous ore for fertilizer. (b) Bullion, alluvial, retorted gold, etc. (c) Includes lead-silver ore. (d) Included with gold—other forms.

TABLE 5 — CONTENTS OF METALLIC MINERALS PRODUCED: AUSTRALIA — (Continued)

Mineral in which contained	Contents of Metallic Minerals Produced					
	1956	1957	1958	1959 ^a	1960 ^a	
					July-Sept.	Jan.-Sept.
IRON (Tons) (a)						
Iron Ore	2,542,826	2,465,523	2,544,462	2,705,855	2,681,780	2,082,912
LEAD (Tons)						
Lead ore (b)	3,990	3,145	2,301	1,433	230	464
Lead concentrate	286,020	320,319	316,048	306,078	73,545	222,080
Lead-copper concentrate	2,355	2,719	2,843	2,521	509	1,754
Zinc concentrate	7,120	7,570	7,155	6,262	1,756	4,960
Total	299,485	333,753	328,347	316,294	76,130	229,258
MANGANESE (Tons)						
Manganese ore — metallurgical grade	25,856	34,904	25,623	40,672	6,773	21,152
Zinc concentrate	5,293	5,858	5,680	5,763	1,330	4,435
Total	31,149	40,762	31,303	46,435	8,103	25,587
MANGANESE DIOXIDE (MnO ₂) (Tons)						
Manganese — Battery grade	528	571	706	1,060	181	516
Other grades	936	668	2,113	1,414	230	563
Total	1,464	1,239	2,819	2,474	411	1,079
MOLYBDENUM DISULPHIDE (MoS ₂) (lb.)						
Molybdenite concentrate	190	15,236	18,568	—	—	—
MONAZITE (Tons)						
Monazite concentrate	93	132	423	331	259	353
OSMIRIDIUM (oz.)						
Osmiridium, native	25	67	42	3	—	n.a.
Platinum concentrate	2	2	1	—	—	n.a.
Total	27	69	43	3	—	n.a.
PALLADIUM (oz.)						
Platinum concentrate	—	—	—	—	—	—
PLATINUM (oz.)						
Platinum concentrate	18	17	22	—	—	—

(a) Excludes iron content of iron oxide not intended for metal extraction or fluxing. (b) Includes lead-silver and lead-zinc ores.

TABLE 5 — CONTENTS OF METALLIC MINERALS PRODUCED: AUSTRALIA — (Continued)

Mineral in which contained	Contents of Metallic Minerals Produced					
	1956	1957	1958	1959 ^a	1960 ^a	
					July-Sept.	Jan.-Sept.
SILVER (Fine oz.)						
Copper ore	1,511	122	1,037	770	—	—
Copper concentrate	343,293	360,266	411,304	541,759	181,916	491,407
Copper precipitate	—	—	38	—	—	—
Gold concentrate	219	356	492	4	18	95
Gold—other forms (a)	205,169	193,319	196,778	193,473	49,201	140,643
Lead ore (b)	474,629	393,896	94,757	31,018	8,268	18,327
Lead concentrate	12,241,159	13,475,649	14,200,130	13,061,589	3,282,205	9,774,716
Lead-copper concentrate	695,592	689,373	761,360	671,412	180,834	540,201
Zinc concentrate	648,350	675,650	638,674	576,338	171,754	470,804
Total	14,609,922	15,788,631	16,304,570	15,076,363	3,874,196	11,436,193
SULPHUR (Tons)						
Lead concentrate	49,697	54,888	51,939	50,404	12,342	36,372
Pyritic ore	4,444	—	—	—	—	—
Pyrite concentrate	82,333	109,026	108,636	106,882	25,111	78,455
Zinc concentrate	168,714	177,529	160,976	151,737	43,462	128,521
Total	305,188	341,443	321,551	309,023	80,915	243,348
TANTALITE-COLUMBITE (Ta ₂ O ₅ + Nb ₂ O ₅) (lb.)						
Tantalite-columbite concen- trate	85,690	23,499	6,736	8,499	1,473	3,057
TIN (Tons)						
Tin concentrate	2,078	1,952	2,237	2,350	509	1,536
TITANIUM DIOXIDE (TiO ₂) (Tons)						
Ilmenite concentrate	2,260	38,888	38,278	45,872	29,927	51,258
Rutile concentrate	93,242	124,863	80,955	79,624	22,826	65,351
Total	95,502	163,751	119,233	125,496	52,753	116,609
TUNGSTIC OXIDE (WO ₃) (Tons)						
Scheelite concentrate	990	950	478	—	85	152
Wolfram concentrate	592	459	372	653	123	586
Total	1,582	1,409	850	653	208	738
ZINC (Tons)						
Lead ore (c)	—	—	20	—	—	7
Zinc ore, for fertilizer	—	—	—	—	—	—
Zinc concentrate	278,082	291,582	263,024	248,778	71,518	211,355
Total	278,082	291,582	263,044	248,778	71,518	211,362
ZIRCON (Tons)						
Zircon concentrate	71,769	87,703	58,745	112,429	26,450	77,361

(a) Bullion, alluvial, retorted gold, etc. (b) Includes lead-silver ore. (c) Includes lead-zinc ore.

TABLE 6 — PRINCIPAL CONTENTS OF METALLIC MINERALS AND QUANTITIES OF ASBESTOS AND COAL PRODUCED: STATES AND AUSTRALIA

Content and States	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
PRINCIPAL CONTENTS OF METALLIC MINERALS PRODUCED							
Antimony	ton	903	1,209	1,356	1,280	191	593
N.S.W.		879	1,208	1,355	1,279	190	590
Victoria		1	1	1	1	1	3
Q'land		—	—	—	—	—	—
W. Aust.		23	—	—	—	—	—
Copper	ton	54,547	59,255	75,715	94,699	29,287	83,984
N.S.W.		4,289	4,382	4,023	3,728	901	2,607
Victoria		—	—	—	14	—	20
Q'land		35,708	35,786	50,511	66,957	22,807	63,703
S. Aust.		1	2	1	16	—	—
W. Aust.		740	788	1,107	2,197	485	1,198
Tasmania		8,807	10,984	11,413	11,836	2,836	9,248
N. Territory		5,002	7,313	8,660	9,951	2,258	7,208
Gold	'000 f. oz.	1,030	1,084	1,104	1,085	275	801
N.S.W.		29	31	19	13	3	10
Victoria		39	46	41	35	6	20
Q'land		56	63	74	92	19	59
S. Aust.		—	—	—	—	—	—
W. Aust.		814	850	875	861	225	642
Tasmania		17	20	22	21	7	19
N. Territory		75	74	73	63	15	51
Iron (a)	'000 tons	12,543	12,466	12,544	12,706	1,682	12,083
S. Aust.		12,332	12,203	12,179	12,225	1,544	11,666
W. Aust.		211	263	365	481	138	417
Lead	ton	299,485	333,753	328,347	316,294	76,130	229,258
N.S.W.		238,319	266,928	246,896	246,449	58,281	175,370
Victoria		—	4	—	—	—	—
Q'land		43,104	51,269	65,799	54,415	14,677	42,513
S. Aust.		17	20	13	8	—	—
W. Aust.		5,828	3,087	1,854	1,382	208	1,081
Tasmania		12,217	12,445	13,785	14,040	2,964	10,294
Silver	'000 f. oz.	14,610	15,789	16,305	15,076	3,874	11,436
N.S.W.		9,289	9,969	8,992	8,555	2,176	6,365
Victoria		2	3	3	2	—	—
Q'land		3,725	4,283	5,675	4,904	1,293	3,823
S. Aust.		1	1	1	—	—	—
W. Aust.		193	188	189	181	—	—
Tasmania		1,373	1,299	1,395	1,368	51	144
N. Territory		27	46	50	66	334	1,057
Tin	ton	2,078	1,952	2,237	2,350	509	1,536
N.S.W.		269	211	239	174	66	144
Q'land		630	772	1,019	1,104	169	599
W. Aust.		240	182	94	174	47	118
Tasmania		938	777	883	890	220	661
N. Territory		1	10	2	8	7	14
Titanium (in terms of TiO₂)							
In Rutile							
Concentrate	ton	93,242	124,863	80,955	79,624	22,826	65,351
N.S.W.		62,470	83,363	44,915	44,792	14,146	40,393
Q'land		30,772	41,500	35,755	34,736	8,546	24,824
W. Aust.		—	—	285	96	134	134
In Ilmenite							
Concentrate	ton	2,260	38,888	38,278	45,872	29,927	51,258
N.S.W.		481	485	59	111	176	365
Q'land		—	78	—	—	—	21
W. Aust.		1,779	38,325	38,219	45,761	29,751	50,872

(a) Excludes iron content of iron oxide not intended for metal extraction.

TABLE 6 — PRINCIPAL CONTENTS OF METALLIC MINERALS AND QUANTITIES OF ASBESTOS AND COAL PRODUCED: STATES AND AUSTRALIA — (Continued)

Content and States	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
PRINCIPAL CONTENTS OF METALLIC MINERALS PRODUCED — (Continued)							
Tungsten (in terms of WO.)	ton	1,582	1,409	850	653	208	738
In Scheelite Concentrate	ton	990	950	478	—	85	152
N.S.W.		2	1	1	—	—	—
Q'land		3	1	—	—	—	—
Tasmania		985	948	477	—	85	152
In Wolfram Concentrate	ton	592	459	372	653	123	586
N.S.W.		2	—	—	—	—	—
Q'land		46	19	5	—	—	—
Tasmania		443	391	360	645	123	581
N. Terr.		101	49	7	8	—	5
Zinc	ton	278,082	291,582	263,044	248,778	71,518	211,362
N.S.W.		229,126	241,509	211,667	202,675	56,510	171,441
Q'land		16,231	19,536	17,484	13,628	6,523	16,254
S. Aust.		7	97	113	—	—	7
W. Aust.		—	—	20	—	—	—
Tasmania		32,718	30,440	33,760	32,475	8,485	23,660

QUANTITIES OF ASBESTOS AND COAL PRODUCED

Asbestos							
Chrysotile	short ton	1,549	2,232	2,255	1,433	333	898
N.S.W.		697	676	712	726	333	829
W. Aust.		852	1,556	1,543	707	—	69
Crocidolite	short ton	8,160	12,438	13,313	16,442	4,461	10,856
W. Aust.		8,160	12,438	13,313	16,442	4,461	10,856
Black coal	'000 tons	19,274	19,919	20,442	20,298	6,246	16,851
Semi-anthracite							
Q'land	'000 tons	81	71	57	54	15	41
Tasmania		79	69	55	52	14	38
N. Territory		2	2	2	2	1	3
Bituminous	'000 tons	17,681	18,229	18,616	18,576	5,697	15,402
N.S.W.		14,793	15,376	15,841	15,712	4,918	13,195
Q'land		119	112	108	90	23	62
Victoria		2,472	2,475	2,393	2,477	680	1,929
Tasmania		297	266	274	297	76	216
Sub-bituminous							
Q'land	'000 tons	1,512	1,619	1,769	1,668	534	1,408
N.S.W.		17	14	10	6	—	—
Q'land		183	157	133	66	19	52
S. Aust.		482	609	755	690	249	641
W. Aust.		830	839	871	912	266	715
Brown coal	'000 tons	10,560	10,741	11,644	13,035	4,147	11,262
Victoria		10,560	10,741	11,644	13,035	4,147	11,262

TABLE 7—IMPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA

Commodity & Country of Origin	Unit of Quantity	1956	1957	1958	1959*	1960*	July-Sept.	Jan.-Sept.
METALLIC GROUP								
Aluminium & aluminium								
Base alloys—								
Ore (bauxite)	ton	38,391	45,147	69,473	66,746	23,602	74,392	
Indonesia		19,625	45,113	69,473	49,466	—	—	
Other		18,766	14	—	17,280	23,602	74,392	
Ingots (refined)	ton	10,223	8,374	14,813	19,268	6,839	20,026	
Canada		4,983	5,070	13,544	17,545	5,613	16,436	
Other		5,240	2,404	865	1,283	1,226	3,590	
Rods and bars	ton	300	661	423	80	3	37	
Plates, sheets & strips	"	2,276	1,881	2,317	2,555	1,374	4,681	
United Kingdom		1,598	1,253	1,335	1,744	1,159	3,498	
Other		678	628	982	811	215	1,188	
Angles, circles, pipes and tubes	ton	124	255	87	84	104	250	
Foil	"	1,938	2,193	2,409	2,788	955	2,910	
United Kingdom		1,877	2,072	2,078	2,476	730	2,419	
Other		61	121	331	312	228	491	
Powder	ton	564	531	486	670	126	477	
Wire, single strand, uncovered	ton	80	43	94	—	54	108	
Scrap (incl. re-melt)	"	139	10	102	70	63	124	
Antimony—								
Ore & concentrate	ton	690	213	10	37	160	253	
Metal, incl. antimonial and lead compounds	ton	21	166	69	174	73	137	
Arsenic trioxide	"	2,170	1,586	2,699	2,402	822	1,934	
Bismuth metal	lb.	35,992	42,589	37,530	36,445	10,042	26,242	
Chromium ore & conc.	ton	3,073	8,653	8,772	6,381	2,015	14,409	
Copper—								
Pigs, ingots & blocks (refined)	ton	250	4,251	659	3,479	875	1,650	
Canada		—	1,150	50	250	200	399	
Rhodesia and Nyasaland		250	2,001	—	1,002	—	—	
Other		—	1,100	609	2,227	675	1,251	
Bars, rods, angles and tees	ton	609	1,108	1,330	227	183	497	
Plates, sheets & strips	"	1,440	920	939	940	891	1,728	
Pipes and tubes	"	14	3	—	22	6	14	
Wire, single strand, uncovered	ton	19	12	34	18	4	9	
Powder	"	54	83	72	105	31	74	
Scrap (incl. re-melt)	"	12	24	17	27	44	60	
Copper-base alloys—								
Pigs, ingots and blocks	ton	65	15	7	46	—	9	
Rolled, drawn and extruded shapes	ton	372	484	627	762	226	713	
Wire, single strand, uncovered	ton	134	176	187	203	19	126	
Scrap	"	18	144	101	64	41	55	
Gold—								
Refined forms (excl. specie, leaf and foil)	f. oz.	12	—	—	—	—	—	
Unrefined bullion	"	201,871	159,998	160,232	136,674	35,267	115,849	
New Guinea		90,809	65,929	45,999	44,636	10,143	33,192	
Fiji		87,897	67,632	92,925	66,035	20,789	60,080	
Other		23,165	26,437	21,308	26,003	4,335	21,377	
Ilmenite concentrate	ton	13,540	500	—	—	—	—	
Iron ore	"	14,052	203,011	296,157	261,904	75,915	200,343	
New Caledonia		14,026	202,982	296,157	261,894	75,915	200,343	
Other		26	29	—	10	—	—	

TABLE 7—IMPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA—(Cont.)

Commodity & Country of Origin	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
METALLIC GROUP—(Continued)							
Iron and Steel—							
Ferro-alloys (excl. powder)—							
Ferro-chromium	ton	1,305	1,777	1,892	2,824	2,310	4,467
Norway		483	825	961	24	1	704
Other		822	952	931	2,800	2,309	3,762
Ferro-manganese	ton	7,339	5,037	3,060	9,910	9,028	19,695
Norway		6,656	3,434	51	87	—	5
Other		683	1,603	3,009	9,853	9,028	19,690
Ferro-molybdenum	ton	131	142	164	108	88	127
Sweden		101	97	138	72	48	72
Other		30	45	26	36	40	55
Ferro-silicon	ton	5,576	7,154	7,482	10,463	368	2,695
South Africa		168	1,704	6,217	10,369	332	2,524
Norway		1,727	1,664	1,146	38	18	48
Other		3,681	3,786	119	56	18	123
Other	ton	786	469	737	684	166	428
Angles and tees	"	28,369	4,684	4,023	14,032	12,648	30,580
Structural steel	"	54,134	12,574	10,592	17,253	23,636	51,736
Bars and rods	"	55,890	17,860	24,798	9,035	20,761	28,699
United Kingdom		20,592	12,312	6,257	5,575	2,780	6,590
Japan		15,802	1,324	11,858	103	18,559	17,654
Other		19,496	4,224	6,683	3,357	2,422	4,455
Hoop	ton	24,809	11,603	11,935	11,730	6,365	12,655
United Kingdom		9,716	7,352	7,407	5,094	1,555	4,562
Other		15,093	4,251	4,528	6,636	4,810	8,093
Strip	ton	4,308	3,474	2,242	2,170	3,445	7,615
Plate and sheet (plain)	"	37,808	15,404	15,918	9,119	86,514	136,326
United Kingdom		22,221	10,986	12,628	6,610	5,608	10,340
Other		15,587	4,418	3,290	2,509	80,906	125,986
Tinplate	ton	120,917	144,199	66,098	50,298	17,095	41,202
United Kingdom		101,269	126,498	57,488	41,788	9,772	29,641
Other		19,648	17,701	8,610	8,510	7,323	11,561
Manganese—							
Metallurgical ore	ton	20	—	5	3	—	1
Battery grade ore	"	2,010	2,049	1,183	1,304	61	167
Metal and powder	"	44	67	85	95	25	60
Mercury	lb.	68,441	55,738	65,398	109,778	67,776	98,347
Italy		19,979	20,798	19,690	42,734	6,840	19,623
Spain		48,360	32,957	23,864	28,122	19,469	29,199
Other		2,102	1,983	21,844	38,922	41,467	49,525
Nickel—							
Pigs, ingots & blocks	ton	683	867	674	806	431	1,251
Rolled, drawn and extruded shapes	ton	130	45	16	22	1	12
Nickel-base alloys—							
Rolled, drawn and extruded shapes	ton	n.a.	n.a.	269	437	35	312
Wire, single strand, uncovered	ton	34	88	78	173	31	75
Platinum and Platinum Group Metals—							
Platinum (excl. wire)	oz.	1,991	2,153	1,385	994	210	950
Other (excl. wire)	"	1,232	1,870	1,108	1,478	325	1,124
Wire	"	1,354	1,518	1,567	1,769	588	1,554
Silver, unrefined bullion	'000 f. oz.	102	77	75	78	16	57
New Guinea		55	34	28	35	8	18
Fiji		36	29	36	28	5	19
Other		11	14	11	15	3	20
Tin (refined)	ton	516	1,218	1,070	1,294	535	1,351
Titanium oxide	"	8,177	6,172	6,996	5,472	1,408	3,207

TABLE 7—IMPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA—(Contd.)

Commodity & Country of Origin	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
FUEL GROUP							
Coal	ton	5,075	9,214	6,315	7,577	536	5,156
Coke (incl. petroleum coke)	ton	2,922	14,887	8,697	7,046		2
Petroleum oils—							
Crude	'000 gals.	1,789,828	2,118,236	2,441,916	2,603,377	681,206	2,042,143
Enriched crude	"	198,822	142,908	95,302	35,559	86,224	169,719
Spirit	"	327,007	183,132	207,500	228,622	60,697	169,739
Kerosene	"	135,755	112,789	97,403	109,141	34,057	82,445
Diesel oil	"	16,294	15,922	11,724	10,296	2,524	9,467
Residual, furnace oil	"	63,206	13,083	7,617	9,903	1,948	6,812
Lubricating oil	"	42,751	40,165	41,665	49,524	11,496	36,321

NON-METALLIC (Excluding Fuel) GROUP

Asbestos—							
Chrysotile	short ton	18,344	22,873	23,408	24,316	8,449	20,977
Canada	"	14,448	18,685	20,323	20,941	7,348	17,414
Other	"	3,896	4,188	3,085	3,375	1,101	3,563
Crocidolite	short ton	65	165	311	328	51	74
Amosite	"	10,644	10,322	13,984	12,019	2,404	7,853
South Africa	"	10,543	10,088	13,417	11,956	2,404	7,736
Other	"	101	234	567	63	—	117
Other	short ton	525	528	1,185	1,667	626	1,597
Barite (ground)	ton	213	96	241	401	26	108
Calcium carbide	"	15,137	12,776	12,413	13,286	7,088	15,100
South Africa	"	8,577	6,197	7,396	8,951	5,003	10,941
Norway	"	4,739	6,381	4,439	3,335	1,590	3,170
Other	"	1,821	198	578	998	495	987
Cement, Portland	ton	11,402	11,812	5,744	12,957	1,761	11,855
United Kingdom	"	7,596	4,753	2,564	3,205	895	2,527
Japan	"	1,600	4,281	—	2,508	504	7,681
Other	"	2,206	2,778	3,180	7,244	362	1,647
Clays—							
Ball clay	ton	773	558	407	798	245	464
Bentonite	"	4,800	5,051	4,952	6,330	2,552	5,358
Fire clay	"	789	831	594	698	148	739
Fuller's earth	"	169	196	150	304	n.a.	n.a.
White clay	"	9,168	6,631	2,502	14,654	2,535	4,804
Clays, n.e.i.	"	1,920	2,403	2,585	4,764	1,438	3,982
Cryolite	"	541	1,475	1,597	858	88	1,123
Diamonds, industrial	carat	245,472	215,719	191,335	320,294	86,266	263,187
South Africa	"	196,696	172,695	127,649	184,860	63,758	169,165
Other	"	48,776	43,024	63,686	135,434	22,508	94,022
Diatomite	ton	4,394	3,856	3,736	4,502	1,603	3,119
Fluospur (fluorite)	"	385	545	975	2,080	376	1,874
Graphite—							
Colloidal	ton	52	47	52	44	29	47
Flake	"	172	236	280	278	73	158
Crystalline	"	107	81	40	163	26	84
Amorphous	"	500	501	542	488	202	363
Kyanite	"	199	487	500	15	10	546
Magnesite	"	2,238	3,833	6,555	2,680	637	8,545
Mica—							
Block or sheet, trimmed	lb.	16,244	18,539	21,368	24,184	9,616	24,633
Cut or stamped	"	1,599	2,373	2,594	2,775	655	2,482
Condenser film (not cut or stamped)	lb.	100	320	—	44	—	—
Splittings (not cut or stamped)	lb.	121,922	182,629	149,450	166,975	80,125	202,650
Ground or pulverised	"	81,702	115,653	217,104	374,461	84,137	244,073
Scrap	"	204,170	325,360	558,940	484,996	109,760	584,640

TABLE 7—IMPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA—(Cont.)

Commodity & Country of Origin	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
NON-METALLIC (Excluding Fuel) GROUP—(Continued)							
Phosphate rock	'000 tons	1,332	1,035	1,501	1,327	490	1,155
Nauru	"	841	590	833	690	319	655
Christmas Is. (Indian Ocean)	"	285	253	361	434	85	308
Gilbert and Ellice Is.	"	204	192	298	191	86	192
Other	"	2	—	9	12	—	—
Potassium chloride (fertiliser grade)	ton	27,725	40,357	47,942	43,259	16,879	31,091
Potassium sulphate (fertiliser grade)	ton	4,304	4,138	7,389	5,951	2,300	3,959
Salt—							
Rock	ton	1,988	3,336	1,879	2,083	—	1,905
Other	"	4,684	4,814	7,178	9,665	1,850	9,375
Sodium nitrate (fertiliser grade)	ton	16,874	9,400	12,804	3,458	10	3,305
Sillimanite	"	161	132	131	135	20	255
Sulphur	"	202,977	120,277	202,421	170,770	83,226	180,939
U.S.A.	"	143,720	71,211	146,831	110,519	62,824	124,235
Mexico	"	40,552	48,722	42,840	59,846	20,253	56,384
Other	"	18,705	344	12,750	405	149	320
Talc	ton	75	285	307	264	144	411

TABLE 8—EXPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA

Commodity & Country of Destination	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
METALLIC GROUP							
Aluminium & aluminium base alloys—							
Ingots (refined)	ton	4	762	—	78	2	15
Rolled, drawn & extru- ded shapes (excl. wire)	ton	30	83	135	162	125	226
Scrap (incl. re-melt) Beryllium ore and con- centrate	"	6	155	123	587	115	431
Cadmium—	ton	309	397	146	—	31	60
Ingots and blocks	ton	71	58	48	17	1	6
Bars and rods	"	71	143	178	126	8	50
Copper—							
Ore and concentrate	ton	12,804	16,067	14,951	73,973	35,273	91,858
Japan	"	12,787	16,046	14,951	64,393	35,273	91,823
Other	"	17	21	—	9,580	—	35
Matte	ton	960	493	—	—	—	—

TABLE 8—EXPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA—(Cont.)

Commodity & Country of Destination	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan.-Sept.
METALLIC GROUP—(Continued)							
Copper—(Continued)							
Blister copper	ton	15,574	19,131	14,421	16,217	—	502
Belgium-Luxemburg		—	3,488	6,805	7,203	—	502
Germany, Fed. Rep.		—	1,984	2,060	5,011	—	—
U.S.A.		15,574	12,620	3,983	4,003	—	—
Other		—	1,039	1,573	—	—	—
Pigs, ingots & blocks (refined)	ton	1,002	1	—	2,749	3,610	8,774
Rolled, drawn and extruded shapes	ton	1,581	1,216	1,365	1,121	517	1,308
Wire single strand, uncovered	ton	202	681	308	314	212	299
Scrap (incl. re-melt)	"	15	—	279	547	30	289
Slags and residues	"	25	114	1,332	45	58	103
Copper-base alloys—							
Pigs, ingots & blocks	ton	36	193	18	100	12	34
Rolled, drawn and extruded shapes	ton	2,141	1,318	283	508	278	761
Wire, single strand, uncovered	ton	50	42	11	12	—	4
Scrap	"	167	—	279	4,936	948	2,757
Copper-lead dross	"	7,698	7,833	7,709	6,019	1,000	3,954
U.S.A.		7,628	4,078	5,035	6,019	1,000	3,326
Other		70	3,755	2,674	—	—	628
Gold—							
Ore and concentrate	ton	—	14	—	—	—	—
Refined forms (excl. specie, leaf & foil)	f. oz.	530,968	783,814	128,550	128,052	321,949	925,573
Hong Kong		523,374	771,302	122,520	124,363	—	1,195
Other		7,594	12,512	6,030	3,704	321,949	924,378
Unrefined bullion	f. oz.	42	—	—	—	—	—
Ilmenite concentrate	ton	1,130	37,811	56,243	68,649	34,695	59,367
Iron and steel—							
Iron ore	ton	117	65	6	293	5	13,705
Pig iron	"	16,420	15,330	19,321	44,038	18,583	52,005
New Zealand		8,253	5,371	9,556	8,504	1,967	6,070
Other		8,167	9,959	9,765	35,534	16,616	45,935
Ingot, blooms and billets	ton	1,747	2,327	728	12,972	193	9,609
New Zealand		22	4	203	29	193	215
Other		1,725	2,323	525	12,943	—	9,404
Bars and rods	ton	16,842	21,595	28,588	39,198	9,190	46,411
New Zealand		5,089	9,839	25,292	30,986	8,359	30,643
Other		11,753	11,756	3,296	8,212	831	15,766
Angles and tees	ton	4,138	8,160	5,786	6,138	1,979	6,368
New Zealand		2,862	3,866	4,457	5,918	1,888	6,134
Other		1,276	4,294	1,329	220	91	234
Plate and sheet, plain	ton	61,070	143,629	85,444	141,313	19,102	55,592
India		418	19,681	3,269	8,396	1,278	3,616
Malaya		57	2,544	6,753	1,667	943	2,638
New Zealand		14,743	20,140	29,501	22,696	5,421	18,726
Japan		36,047	60,603	153	416	723	1,033
Other		9,805	40,661	45,768	108,138	29,579	108,138
Plate & sheet, galv's'd	ton	38,484	86,378	58,938	58,488	15,782	44,119
India		13,285	10,746	50	1	—	1,635
New Zealand		17,994	51,371	32,989	39,367	10,931	26,967
Philippines		—	3,631	1,736	97	39	521
Other		7,205	20,630	24,163	19,023	4,812	14,976
Scrap	ton	105,123	178,255	156,978	182,985	51,052	153,279
Japan		82,280	152,417	134,457	167,645	48,578	139,447
Other		22,843	25,838	22,521	15,340	2,474	13,832

TABLE 8—EXPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA—(Cont.)

Commodity & Country of Destination	Unit of Quantity	1956	1957	1958	1959*	1960*	
METALLIC GROUP—(Continued)							
Lead—							
Ore and concentrate	ton	77,362	91,236	83,984	90,848	25,900	59,343
Belgium-Luxemburg		2,891	5,169	21,822	8,816	3,997	8,162
Japan		13,352	31,326	18,029	23,100	9,879	15,291
U.S.A.		57,137	50,697	37,552	38,283	5,004	19,520
Other		3,982	4,044	6,581	20,649	5,020	16,170
Bullion	ton	38,190	47,618	58,068	52,983	13,173	37,073
United Kingdom		38,190	47,618	58,068	52,983	13,173	37,073
Pig	ton	149,061	160,589	155,730	138,448	36,120	94,266
United Kingdom		64,362	57,717	53,407	76,045	20,275	50,495
India		3,710	3,871	6,126	1,839	672	1,572
New Zealand		4,673	4,391	5,350	3,580	1,528	3,322
Japan		1,930	16,106	1,799	1,282	2,564	4,052
U.S.A.		73,478	74,707	75,542	46,780	10,002	29,073
Other		908	3,797	13,506	8,922	1,079	5,752
Rolled and extruded shapes	ton	82	182	99	86	14	73
Antimonial lead	"	159	345	109	597	45	315
Scrap	"	10,708	8,372	5,152	1,390	241	817
Slags and residues	"	2,678	3,011	2,604	991	204	537
Manganese ore	"	2	30,061	18,999	31,312	14,019	33,932
U.S.A.		—	21,165	7,794	4,165	—	21
Other		2	8,896	10,605	27,647	14,019	33,911
Monazite concentrate	ton	56	145	102	150	22	48
Nickel and nickel-base alloys	ton	80	28	31	139	38	104
Platinum and platinum group metals—							
Ore and concentrate	lb.	3	24	48	3	2	2
Metal and powder	oz.	805	369	854	197	224	545
Rutile concentrate	ton	89,887	119,052	75,615	80,938	22,131	66,685
United Kingdom		12,494	11,022	11,630	8,652	2,843	8,461
Netherlands		8,900	9,871	9,446	10,931	2,775	7,409
U.S.A.		46,210	70,613	26,219	22,537	6,085	18,218
Other		22,283	27,546	28,320	38,818	10,428	32,597
Silver—							
Refined ingot or bar	'000 f. oz.	16,412	3,670	4,875	2,958	585	2,138
Refined other	"	32	2	1	43	9	18
Unrefined bullion and matte	'000 f. oz.	148	12	—	—	—	—
Tantalum & columbium ore and concentrate	ton	48	6	8	8	4	12
Tin—							
Concentrate	ton	48	162	25	42	—	—
Refined	"	24	21	11	9	3	14
Tin-base alloys	"	7	23	50	21	6	23
Tungsten—							
Scheelite concentrate	ton	1,388	1,387	506	145	150	240
United Kingdom		250	59	134	114	90	150
U.S.A.		1,114	1,167	276	—	—	—
Other		24	161	96	31	60	90
Wolfram concentrate	ton	824	653	442	993	248	753
United Kingdom		177	117	66	80	28	32
U.S.A.		442	322	163	722	200	646
Other		205	214	213	191	20	75
Zinc—							
Concentrate	ton	267,402	323,654	261,279	191,634	104,973	251,484
United Kingdom		143,072	179,439	115,825	87,002	58,282	132,056
Belgium-Luxemburg		85,895	88,817	115,558	47,752	19,454	37,358
Other		38,435	55,398	29,896	56,880	27,237	82,070
Refinery-type shapes	ton	31,594	37,092	37,938	41,606	6,304	20,470
United Kingdom		10,568	3,952	7,727	9,857	601	2,820
India		12,227	22,337	21,940	17,279	4,424	11,886
U.S.A.		6,002	8,002	2,001	6,911	—	401
Other		2,797	2,801	6,270	7,559	1,279	5,363

TABLE 8 — EXPORTS OF MINERALS AND MINERAL PRODUCTS: AUSTRALIA—(Cont.)

Commodity & Country of Destination	Unit of Quantity	1956	1957	1958	1959*	1960*	
						July-Sept.	Jan-Sept.
METALLIC GROUP—(Continued)							
Zinc—(Continued)							
Plates and sheets	ton	91	135	86	22	—	42
Circles and strips	"	2,192	1,426	1,004	1,074	456	820
Slags and residues	"	5,460	4,470	3,470	8,061	1,626	4,303
Scrap	"	527	414	269	344	64	640
Zircon concentrate	"	68,838	85,254	60,895	108,820	27,927	82,485
United Kingdom	"	15,090	18,212	21,043	26,635	8,267	25,468
U.S.A.	"	28,026	37,735	19,017	46,135	5,435	23,505
Other	"	25,722	29,307	20,835	36,050	14,225	33,112

FUEL GROUP

Coal	ton	239,379	759,095	823,925	794,190	450,664	1,108,320
Argentina	"	—	—	88,891	109,673	—	—
New Caledonia	"	152,629	183,280	171,561	143,580	35,571	102,872
Japan	"	28,189	440,896	360,709	480,613	402,136	946,758
Korea, Republic of	"	34,837	93,011	173,243	15,813	8,623	49,769
Other	"	23,724	41,908	29,521	44,511	4,334	8,921
Coke	ton	87,985	181,842	52,460	20,899	21,569	72,621
New Caledonia	"	84,190	145,338	51,848	19,396	20,472	71,033
Other	"	3,795	36,504	612	1,503	1,097	1,588
Petroleum oils—							
Spirit	'000 gals.	19,829	36,133	80,171	32,687	5,890	20,825
Kerosene	"	10,361	3,087	9,914	16,036	4,979	14,888
Diesel oil	"	2,693	21,294	43,081	95,963	34,626	116,588
Residual, furnace oil	"	147,872	156,027	202,052	144,222	46,475	127,760
Lubricating oil	"	1,220	1,039	1,050	1,371	604	1,310

NON-METALLIC (Excluding Fuel) GROUP

Asbestos—							
Chrysotile	short ton	40	378	264	197	—	20
Crocidolite	"	7,579	10,892	10,049	12,684	1,851	5,223
U.S.A.	"	3,405	6,253	6,020	9,635	965	1,454
Other	"	4,174	4,639	4,029	3,029	886	3,769
Other	short ton	101	59	120	93	43	82
Barite (ground)	ton	757	3,377	2,494	1,108	1,631	5,785
Cement, constructional	"	6,444	19,342	20,401	13,364	2,059	5,409
New Guinea	"	903	2,205	4,732	2,124	141	607
Fiji	"	546	5,812	8,659	4,725	16	59
Christmas Is. (Indian Ocean)	"	1,851	5,398	1,098	703	—	1,100
Other	"	3,144	5,927	5,912	5,812	1,202	3,643
Clays	ton	1,123	799	646	1,110	289	760
Diamonds, industrial	carat	114,311	68,268	41,529	57,478	8,578	18,429
Diatomite	ton	46	26	46	36	n.a.	n.a.
Felspar	"	357	—	10	—	n.a.	n.a.
Graphite	"	5	9	8	5	n.a.	7
Gypsum	"	37,618	41,780	68,138	77,876	21,456	63,762
New Zealand	"	37,618	40,554	62,128	66,665	18,515	51,309
Other	"	—	1,226	6,010	11,211	2,941	12,453
Magnesite	ton	108	53	31	64	61	77
Mica	lb.	6,490	9,177	28,748	90,248	14,919	27,186
Opals	value £A	173,835	288,951	351,342	674,948	228,310	760,407
Salt	ton	22,848	18,556	20,346	20,346	5,434	14,330
New Zealand	"	20,537	17,126	16,982	15,547	4,932	12,484
Other	"	2,311	1,430	3,364	4,799	502	1,946
Superphosphate	ton	1,882	1,616	1,607	1,619	21	40
Talc	"	3,320	2,326	3,256	2,620	908	2,369

III. APPENDIX

The following later information has become available since compilation of statistical tables for periods up to 30th September, 1960. The figures are preliminary and subject to revision.

TABLE 9 — SMELTER AND REFINERY PRODUCTION OF PRINCIPAL METALS: AUSTRALIA

(Excludes secondary metal (i.e., metal recovered from scrap) unless otherwise specified)

Metal	Unit of Quantity	Production*			
		Oct. 1960	Nov. 1960	Dec. 1960	Oct.-Dec. 1960
Aluminium (refined)	ton	1,010	958	1,031	2,999
Cadmium (refined)	"	n.a.	n.a.	n.a.	n.a.
Copper (blister) (a)	"	6,878	4,881	5,578	17,337
Copper (refined)	"	6,240	7,225	5,594	19,059
Gold (refined) —	f. oz.	80,974	99,251	79,811	260,036
Australian origin	"	7,066	7,240	11,789	26,095
Overseas origin	"	—	—	—	—
Total refined gold	"	88,040	106,491	91,600	286,131
Lead —					
Refined (b)	ton	15,164	14,404	16,445	46,013
Lead content of lead-silver bullion produced for export	ton	4,747	4,245	4,473	13,465
Total lead content	"	19,911	18,649	20,918	59,478
Pig iron (c)	"	255,616	249,030	278,458	783,104
Steel ingots (c)	"	315,202	312,584	336,276	964,062
Silver (refined)	'000 f. oz.	840	644	725	2,209
Tin (refined)	ton	192	177	274	643
Zinc (refined slab) (d)	"	10,460	10,287	10,680	31,427

(a) Total production for refining in Australia and overseas. (b) Includes lead content of antimonial lead. (c) Includes recovery from scrap. (d) Includes small quantities of metal recovered from zinc dust used in works.

Note: Particulars of refined aluminium, cadmium, copper, lead, silver, tin and zinc in Table 9 were collected by the Bureau of Mineral Resources.

TABLE 10 — MINE PRODUCTION OF GOLD AND COAL: AUSTRALIA

Item	Unit of Quantity	Production*			
		Oct. 1960	Nov. 1960	Dec. 1960	Oct.-Dec. 1960
Gold (a)	f. oz.	95,544	89,474	97,038	282,056
Coal —	'000 tons	1,938	2,054	1,672	5,664
Black	"	1,299	1,239	1,167	3,705
Brown	"	—	—	—	—

(a) Gold content of minerals produced