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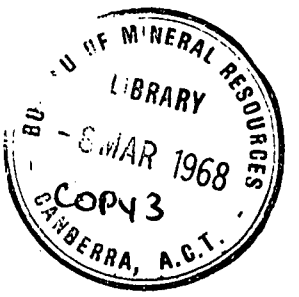

PROGRESS IN THE AUSTRALIAN COAL MINING INDUSTRY - 1950-1966

by

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1950-1966

INTRODUCTION

In September 1967 the External Relations Division of the European Coal and Steel Community requested detailed information about the Australian Coal Industry since 1950. The extensive nature of the information required, covering such varied headings as reserves, production by type and grade, size of labour force, costs and prices, consumption, etc., suggested that it would be appropriate to prepare the information in the form of a Bureau Record.

DISTRIBUTION OF THE DEPOSITS

Deposits of black coal are known and have been worked in all States of Australia. However, the major deposits, in terms both of tonnage and value, lie in New South Wales and Queensland.

Detailed descriptions of the coalfields and the industry are contained in publications prepared for the Fifth Empire Mining and Metallurgical Congress in 1953 (A.I.M.M., 1953) and for the Eighth Commonwealth Mining and Metallurgical Congress in 1965 (Andrew, 1965 and Waters, 1965). McLeod (1965) also gives short descriptions of the individual coalfields.

In New South Wales the age of the commercial deposits ranges from Permian to Jurassic and they consist almost entirely of good quality bituminous coals. The brown coals of Tertiary age, so well developed in Victoria, do not occur in New South Wales. Most of the productive mines have been opened on the edge of the sedimentary basin which extends north, west and south from Sydney.

In Queensland, coal occurrences are spread along the coast and extend several hundred miles inland in some areas. Where local economic conditions were such as to make it profitable to do so, deposits were opened up in many parts of the state to meet local requirements. The two major areas, however, are that extending west north westerly from Brisbane to Injune, including the West Moreton field centred on Ipswich, and that extending south from Collinsville near Bowen, beyond the railway running west from Rockhampton, to Kianga and Moura, south west of Gladstone.

In South Australia, the only source of coal to have been exploited in recent years is the sub-bituminous coal deposits of Leigh Creek. The coal measures here are of Triassic age and rest on folded Upper Proterozoic rocks. They were preserved in this area by differential down warping in relation to the surrounding rocks, and covered by post-Triassic sedimentation. These deposits have been worked by open cut methods since 1943. Other coal occurrences, of no commercial significance at present, are also known.

The Western Australian deposits, like those of South Australia, are of sub-bituminous or lower grades of coal. These are not equal in quality to the coal of the main New South Wales deposits. Although other occurrences are known in the south west of the State, and elsewhere, the Collie deposits are the only ones to have been worked extensively. They are surrounded by pre-Cambrian crystalline rocks, and are unconformably overlain by lake beds and laterite and by recent deposits of drift sand. Rowe, (1953), considered that the coal is of drift origin and that it was deposited in the shallow waters of an estuary. The present coalfield is a remnant which has been preserved by the downfaulting of the older crystalline rocks on which it rests.

In Tasmania, coal occurrences over a wide area have been known for many years. Continuity of the coal-measures has been broken by faulting and erosion, and they now appear as small isolated fields. Coals of a variety of ranks are found ranging from brown coal to sub-anthracite. Most seams are high in ash and also include bands of mudstone. This results in a very high ash content in the small coal produced by the mining methods adopted. Washing plants are used to reduce the ash content of coal sold.

In Victoria, very large deposits of brown coal exist to the east of Melbourne in the Latrobe Valley and to the west and south west in the Bacchus Marsh - Altona and Anglesea areas. These have been worked by open cut methods since the nineteen twenties to supply a portion of Victorian fuel requirements. Coal mined by underground methods from thin and faulted seams in the Wonthaggi area has been the only source within the State of black coal for railway and power station use. Production of black coal has been continuously declining since the nineteen thirties.

Analyses of some typical coals are set out on Table 1, compiled from Eighth Commonwealth Mining and Metallurgical Congress publications.

THE INDUSTRY IN 1950

Table 2 (Joint Coal Board) indicates that New South Wales has always been the predominant State as regards production of black coal. In other States much smaller production of coal from local sources has been undertaken to meet local requirements for industrial, railway, and power station coal. Gas coal was exported from New South Wales to most other States - only Queensland was really independent of the New South Wales industry. In some states New South Wales coal was at one time used extensively for power stations, railways and industrial purposes.

In the New South Wales industry before 1929, the dividends on paid up capital and price of shares of public coal mining companies operating in the State indicated that the industry was providing a return of about 8 to 10 percent on money invested in it.

As a result of the financial depression the profitability of the industry deteriorated as from 1928 and, by 1930, public comapnies were earning only about $1\frac{1}{2}$ percent on the capital employed. This figure fell still further to $\frac{1}{2}$ percent

in 1936, and by 1939 had recovered only to an average of 3¼ percent.

Price control was applied by the Commonwealth Government as from September 1939, and continued throughout the period of the 1939-1945 war. In general, the profit margin was fixed at that applying at the outbreak of war, and this state of affairs continued so that by 1946, taking the public coal companies as an index, a very inadequate return on capital had been received by the coal industry during the preceeding eighteen years. This factor had resulted in the industry generally not keeping abreast of the times as regards production methods. The notable exceptions to this were those collieries which were operated by the iron and steel industry where some mechanization had been introduced as early as 1934.

Labour difficulties had plagued the industry from its beginning in the early days when New South Wales was a British colony. In 1945, the industrial situation on the New South Wales Coalfields was such that it threatened to severely limit the recovery and expansion of Australia in the post war years. The Commonwealth Government appointed a Board of Inquiry to recommend a course of action to revive the industry.

Owing to the resignation of various members, the Board's work was completed by its Chairman, Mr. Justice Davidson, as sole Commissioner. He recommended a Joint (Commonwealth-State) Board of Control with the necessary authority for the establishment of what he regarded as the four basic requirements for restoration of the industry. These were :-

a) the preservation of discipline in the industry,

b) confidence in the sanctity of agreements and the efficacy of the law,

c) collection and publication of facts and statistics,

d) essential innovations.

This Board was duly established and set about the task of bringing the industry to a state of profitable efficiency.

By 1950 the Board had taken over control of prices and was pursuing a policy of pricing so as to encourage investment in the industry for increased efficiency. Mechanical equipment was being made available, in part through hiring pools established by the Board. With the mechanization of the industry, contract face work, a very common source of industrial trouble, was gradually eliminated. Open cut mining was increased as a temporary expedient to obtain badly needed supplies of coal during the period of reorganization. Amenities of many descriptions were provided, both at collieries and in coalfields communities generally.

The New South Wales industry in 1950 was supplying coal for gas, railway, industrial and power station use to many other States, as well as New South Wales requirements for these purposes, and the iron and steel industry.

DEVELOPMENT SINCE 1950

Developments in the industry since 1950 in the various States will be considered under the headings which were described by the European Coal and Steel Community as being of particular interest to them.

RESERVES (BLACK COAL)

In the B.M.R. 1948 Review of the Australian Mineral Industry an estimate of black coal reserves in Australia was quoted from Elford and McKeown (1947). This estimate was sponsored by the Standards Association of Australia. The following figures for reserves of black coal in millions of tons were reported:-

New South Wales	11,668
Queensland	1,704
Tasmania	244
Victoria	33
South Australia	650
Western Australia	800

The 1949-1950 Annual Report of the Joint Coal Board stated that drilling had increased open cut reserves of commercially recoverably coal in New South Wales from 5 to 35 million tons in a few years. The search for reserves at this stage was concentrated on opem cut coal as a valuable means of supplementing underground output during the period required to develop new underground collieries and re-organize and re-equip existing ones. This period had coincided with accelerated demand by Australian Industry's post-war expansion.

When the thirteenth annual report of the Board was prepared in 1960, sufficient additional information had been obtained about reserves in New South Wales to provide the following figures :-

Coking Coal

Districts south of Sydney, 1,185 million tons measured and indicated.

Newcastle district - 250 million tons, measured and indicated.

Upper Hunter district - 157 million tons, measured and indicated.

Gas making Coal

High volatile coals only were considered and the reliability of estimates was lower than for coking coal. In the Maitland-Cessnock and Muswellbrook districts, measured and indicated reserves of Greta coal - at least 400 million tons. (Greta seam coal is regarded as the premier gas and steam raising coal of New South Wales).

In the fifteenth annual report of the Board (1961-62) the reserve position of New South Wales coal was discussed at some length. The main point made was that with increasing study the criteria by which reserves were measured were being steadily refined. The Standards Association of Australia's 1955 estimate placed measured and indicated reserves of extractable coal in New South Wales at 10,825 million tons. In 1958 the Department of National Development assessed the in situ total of measured and indicated reserves at 8,650 tons of which 3,810 million tons was extractable. The Joint Coal Board's technical officers advised in mid 1961 that further study had indicated measured and indicated reserves of New South Wales coal were no more than 5,500 million tons, most of which was a total in situ figure. They gave a figure of 3,050 million tons of recoverable coal as the final result of their review in February 1962. The Board expressed the view that exploratory drilling should be increased by about 50,000 feet a year (to 100,000 feet a year) in order to maintain an adequate rate of exploration for the annual production, at that time running at 19 million tons.

In the 1962/63 Annual Report of the Board, Appendix 3 was prepared to give the latest position regarding reserves in New South Wales. This appendix is reproduced in full as Appendix 1 to this Record. Measured and indicated reserves amounted to 3,080.5 million tons. It was not claimed that this was an accurate figure, but that it was more reliable than those estimates prepared in previous years.

A report on black coal reserves in Australia was prepared by the Board's Chief Geologist and Sir Harold Raggatt, formerly permanent head of the Department of National Development, and published as an appendix to the Board's 1964/65 Annual Report. This stressed the need for a better knowledge of reserves of coking coal, and the Board expressed the view that the rate of drilling for new coal reserves was quite inadequate. The report is reproduced here as Appendix 2.

The Joint Coal Board Annual Report (1965/66) includes reserves of black coal within New South Wales colliery holdings as estimated by the colliery companies, and these are reproduced in this Record as Appendix 3. In view of the considerable variation from reserves for coalfields previously published, the Board decided that coalfield reserve figures would not be published until further progress had been made with the Board's independent study of reserves within and without colliery holdings.

Reserve figures for New South Wales in recent years have been calculated in accordance with the "Code for Calculating and Reporting Coal Reserves in New South Wales" prepared by the Standing Committee on Coalfield Geology set up in 1961-62 to assist in standardizing many aspects of coalfield geology, such as stratigraphic nomenclature, coal terms and calculation of coal reserves. This code is reproduced as Appendix 4 to this Record.

RESERVES (BROWN COAL)

Brown coal reserves in Victoria were reported in the BMR 1951 Review of the Australian Mineral Industry as being estimated as 27,000 million tons.

By 1962, Victorian reserves had been increased substantially by exploration carried out in the intervening period, and were quoted in the Report of the Coal Utilization Research Advisory Committee issued in that year as 54,700 million tons (measured and indicated) and 43,000 million tons (inferred); of these totals 45,000 million tons and 42,000 million tons respectively were in the Latrobe Valley. 17,500 million tons were considered recoverable under existing conditions by open cut mining methods.

In February 1965, information supplied to the Tariff Board by the State Electricity Commission of Victoria gave the following estimates of proven reserves of brown coal in areas other than the Latrobe Valley :

Anglesea - 400 million tons

Bacchus Marsh - 150 million tons

Gelliondale - 200 million tons

For South Australia the Coal Utilization Research Advisory Committee Report quoted lignite reserves of 530 million tons (measured and indicated). None of the South Australian reserves have been brought into production up to the present time.

PRODUCTION

Tables 1 to 4 of the statistical section of the 1965/66 Joint Coal Board Report set out production on the following bases :-

Table 1 Production of Black Coal by States from 1922

Table 2 Production of Black Coal from Underground and Open Cut Mines, New South Wales by Districts, from 1941.

Table 3 Production of Black Coal from Underground and Open Cut Mines, Australia by States, from 1941.

Table 4 Production of Black Coal by seam from New South Wales - 1964 and 1965.

These tables are reproduced as Tables 2 to 5 of this Record.

As was noted in the section dealing with distribution of deposits, black coal produced in New South Wales, Queensland, Victoria and Tasmania is predominantly bituminous, while that produced in South Australia and Western Australia is sub-bituminous.

Brown Coal production in Victoria is set out in Table 6, compiled from Australian Mineral Industry Annual Reviews.

MINING METHODS AND PRODUCTIVITY TRENDS

(i) New South Wales

Most of the coal in this state has been mined from underground using the bord and pillar method of working which is appropriate to the seam thicknesses and depths of cover encountered.

By the early nineteen fifties the action taken by the Joint Coal Board to revitalize the industry was having some effect. Roof bolting was being introduced and mechanized cutting, loading and hauling of coal was increasing. The collieries of the Broken Hill Proprietary Company had been mechanized for a number of years, the first machines having been introduced as long ago as 1934. In 1950, about 65 percent of the coal from these collieries was machine cut and mechanically loaded, and a further 10 percent machine cut, but hand loaded. The remaining 25 percent was hand won from older colliery workings and from one particular seam where the longwall method was in use. On the Southern Coalfield, Australian Iron and Steel Ltd. (a subsidiary of the Broken Hill Proprietary Company Ltd.) was in the process of mechanizing its mines at an estimated cost of $A8 million (£A4 million).

At this stage of development of mechanization an important factor was the ban placed by the Miners' Federation on the extraction of pillar coal by machine. This was particularly significant in the Cessnock area, where over 291 million tons of coal was locked up in barriers and pillars in the Greta seam - a high quality gas and steam raising coal. Because of the great thickness of this seam, it was particularly subject to substantial losses of pillar coal, which occurred when sections of mines were sealed off because of fires which developed by spontaneous combustion in the pillars as they crushed. An expert committee reported in 1951 that the future of mines in this area rested on the successful extraction of this pillar coal. Agreement was reached between the Board, the State Government and certain colliery managements to commence experimental stowage work in a number of mines in this area. The Miners' Federation was represented on the committee appointed to formulate and put into effect the detailed scheme to study stowage as an aid to pillar recovery. The experimental projects approved by the committee were mostly abandoned, discontinued or modified between 1953 and 1961. By 1962 the Joint Coal Board had reached the conclusion that stowage had failed in its original intention and that further stowage barrier schemes could not be supported. The work carried out indicated that though some conservation of coal would be technically possible, stowage costs would be impossibly high in relation to the competitive nature of the expected market for Grete seam coal. The greater range of mining machines and techniques available, the prevailing industrial climate, and the progress in research into other ways of reducing the amount of Greta seam coal lost in pillars, combined to render stowage obsolete as a conservation measure.

In 1954 the Miners' Federation and the colliery proprietors reached agreement over the question of mechanical extraction of pillar coal, and the practice commenced at a number of mines in September 1954. By 1960 almost all pillar coal was machine loaded. Hand loaded pillar coal amounted to only 2.7 percent of total production.

Hand mining methods had been a source of considerable friction between management and miners over the rates and allowances to be paid for contract face work. One of the benefits of mechanization was the change to a fixed rate basis for payment of employees engaged in the mechanized methods of mining.

By 1959 incentive schemes had been introduced to some mechanized mines under which over-award payments related to mine output were paid to all employees. These schemes give employees a direct interest in increasing the productivity of their mine. In 1959 the group of mines with incentive schemes employed 17 percent of the workers in underground mines, but produced 27 percent of the output. At the end of June 1961, 74 percent of employment and 81 percent of output was associated with underground mine incentive schemes. A steady increase in the tonnage mined under such schemes took place in subsequent years and by the end of June 1966, 90 percent of mine workers accounting for 94 percent of coal production were employed in coal mines with incentive schemes.

Tables 7, 8, 9A and 9B, compiled from Joint Coal Board Annual Reports, demonstrate the trends in productivity consequent on increased mechanization.

In 1963 an experimental longwall unit was placed in production at Coalcliff colliery in the Southern District, and by June 1965 three longwall units had been purchased for collieries in the Southern District. Limited success only has been met with in adapting the machinery and method of working to the conditions experienced in the Southern District, particularly those caused by the sandstone roof. It is unlikely that the method will be much more widely employed until the major difficulties associated with its introduction are overcome.

The initial mechanization of collieries in the early nineteen fifties was accomplished by the introduction of coal cutters, loaders, shuttle cars, belt conveyors and diesel and storage battery locomotives. Although the first continuous mining machine was operating in 1951/52, it was 1956 before significant numbers of this type of machine were introduced. They were responsible for 22 percent of production by 1959, almost 60 percent by 1962 and 81½ percent by 1966 when 146 machines were in use. Mobile roof bolting machines were introduced about 1959, and shuttle cars and conveyor belts became established as the principal haulage methods. Table 10 (Joint Coal Board) shows the tonnage handled by various methods in 1966.

Borer-type continuous miners were introduced for testing in 1964. Diesel shuttle cars were first put into service in 1965/66. With increased mechanization there was a marked trend toward concentration of effort on a limited number of faces in the various collieries, and improvements in ventilation standards resulted.

Another marked change has been the development of the practice of drift haulage by conveyor belt in preference to shaft winding. Some shaft mines have been converted to drift mines and in the period 1944 to 1963 the tonnage of coal transported by drift has increased from 6.2 to 16.2 million tons per year while that handled by shaft has fallen from 4.6 million tons per year to 2.1 million tons per year over the same period.

With the expansion of mechanization the number of coal washeries has been progressively increased since 1953 and by 1963 the raw coal washed per year had risen to 8.68 million tons for a recovery of 7.36 million tons of clean coal. 32 plants were operating and 11.9 million tons of coal were washed in 1965.

The increased capitalization of the collieries led to a growth in multiple shift operation and by June 1961 over 18 percent of total production came from the second and third shifts. This had increased to 36 percent by 1966.

Soon after its establishement the Joint Coal Board had set out to expand production from open cut mining with the object of obtaining a substantial increase in the quantity of coal produced in a short time so as to meet industrial requirements for coal pending the rehabilitation of the underground industry.

Many open cuts were brought into production with light road building plant, but new and more suitable equipment was ordered by the Joint Coal Board and as this was delivered and brought into use open cut production increased to a peak of 2.5 million tons in 1952 (see Table 3). Thereafter, production was allowed to run down rapidly and stabilized at between 400,000 and 1 million tons per year. Some of the fluctuations in this range were due to changes in the level of export orders held and shipping availability. In addition to coal for export some pockets of coal in the South Maitland area are not recoverable by normal underground methods and are mined by open cut methods.

See Table 11 (Joint Coal Board) for a general picture of the overall increase in productivity in New South Wales since 1951/52.

(ii) Queensland

In the early nineteen fifties, the main feature of the Queensland coal industry was the large number of small mines in widely scattered areas operating on unproved reserves. Because of the small size of the mines and the limited capital and uncertain market available to the owners, the extent of mechanization was quite limited.

The Queensland Coal Board introduced a programme of drilling to prove new reserves and undertook to provide financial assistance for mechanization.

Productivity in Queensland collieries at that time is illustrated by the following figures :

	O.M.S. at Coal Face	O.M.S. Overall
July-December 1949	5.99 tons	2.51 tons
July-December 1951	6.44 "	2.62 "
Percentage increase	7.5	4.4 "

Bord and pillar mining with hand and horse haulage was the principal production method. Power borers and pneumatic picks were in use at some collieries. Pillar recovery was haphazard and slow, with individual pairs of hand miners working one pillar in some cases. Losses were high as a consequence of this practice.

Most Queensland coal production at this time was from the West Moreton field. Here the ash content of coal had increased from 16 percent in 1940 to 25 percent in 1948. One of the early activities of the Board was to introduce screening and picking belts as a way of preventing the continuation of this upward trend. The small size of most collieries suggested that any introduction of washing plants might need to be on a cooperative basis. See Table 12 (Queensland Coal Board) for an illustration of the size of Queensland collieries at this time.

Mechanization proceeded slowly in the established mines, because their hand-mining layouts were unsuited to mechanized mining, but wherever possible diesel locomotives were introduced. Newly opened mines were planned and developed with mechanization in mind.

By 1962 it was possible for the Queensland Coal Board to report that the face O.M.S. of completely mechanized mines which produced 31.8 percent of the total underground coal won in 1961/62 was 19 tons. There were 14 completely mechanized, 6 partly mechanized and 34 entirely non-mechanized mines in the State at that time. 60 percent of the Rosewood district production of the West Moreton field was washed and a washery since installed has increased the Ipswich district proportion to 100 percent washed coal. Ash content of the West Moreton field production was reduced to 22.5 percent as a result.

Details of Queensland Coal Production and productivity are shown in the attached Tables 13 and 14 (Queensland Coal Board).

Open cut mines were opened with road building plant in the early part of the period being considered, but more recent developments for export and power station use have included modern specialized machinery such as the 35 and 140 cubic yard draglines at Thiess Peabody Mitsui Pty. Ltd.'s open cut at Moura. See Table 11 for a general picture of the increase in productivity in Queensland as a whole since 1951/52.

(iii) Victoria

There have been few unexpected changes in Victorian coal mining practice. In the Yallourn and Morwell open cuts of the State Electricity Commission, the original bucket chain dredgers and rail haulages have been supplemented by bucket wheel excavators and mobile conveyor belt structures as this more modern equipment has become available. Elsewhere, conventional earthmoving machines have been used for the smaller scale brown coal mining operations. These machines have been replaced from time to time as more effective equipment has become available.

Black coal mining in Victoria was partly mechanized with the introduction of electrical boring machines and scraper loaders in the early nineteen fifties, but since then the industry has run down and productivity has not shown any significant change. See Table 11 for productivity of the Victorian black coal industry since 1951/52.

(iv) Western Australia

The increasing demand for coal by public utilities and private consumers, together with a shortage of coal from the eastern states led to the undertaking of an extensive mechanization programme of the Collie mines in the early nineteen fifties in an effort to meet the State's requirements. Bord and pillar operations were mechanized by the introduction of cutters, loaders and shuttle cars feeding to conveyor belts and locomotive haulage to the main belts which hauled by drift entries to the surface. Roof bolting was introduced as an aid to roof control and a continuous mining machine, introduced in 1951, was found satisfactory.

As in New South Wales, increased production was obtained from open cut mining during the period when the underground mines were being re-developed for mechanization. There was a subsequent decrease in open cut production as the mechanized underground mines became able to supply all requirements. More recently open cut production, using modern equipment and techniques, has been increased to meet competition from petroleum products, particularly refinery by-products.

By 1953, the Western Australian Mines Department's Chief Coal Mining Engineer was able to report that the Collie coalfield was more highly mechanized than any other in Australia. In that year, hand mined coal amounted to only 8 percent of production from underground mines.

With the establishment of an oil refinery at Kwinana, residual oil and petroleum products generally began to exert considerable competitive pressure upon Collie coal in Western Australia. Costs were reduced by mechanization and only reluctance on the part of the owners of one colliery to make a large capital outlay in the face of uncertain market conditions prevented full mechanization of the field. Production in this colliery was allowed to run down from 1958 and it finally closed in 1960.

In 1957 firm contracts for the supply of coal to Government utilities for a three year period were made. This was the first occasion such long term arrangements had been made with producers on the Collie field. In spite of the stabilizing effect of these contracts, production from deep mines was well below capacity for a number of years. Some of the collieries closed when new contracts for the supply of utility coal were not obtained by them in 1960. The required production was obtained from previously surplus capacity in the surviving mines and from increased open cut production.

Table 11 sets out the changes in productivity both of face and all workers since 1951/52.

(v) South Australia

As in Victoria, the open cut mining operations at Leigh Creek have moved with the times, employing larger mechanical units to mine greater quantities of coal from greater depths.

In 1950 one of the principal units for overburden removal was a walking dragline with 8 cubic yard bucket and 200 ft boom; a 7 cubic yard shovel and 4 cubic yard dragline were in use for coal loading in 1959. By 1961 an 18 cubic yard dragline was in use for overburden removal. The field supplies coal to the Port Augusta power station which in 1961 produced 70 percent of the State's power requirements.

The increases in productivity since 1951/52 are shown on a yearly basis on Table 11.

(vi) Tasmania

Mechanization was being introduced to the Tasmanian collieries at the beginning of the nineteen fifties. A continuous miner was introduced to the Cornwall Coal Co.'s operations in 1950, and mechanized boring and haulage machines were introduced in other mines. Production was rising, and meeting all requirements except for gas coal by 1953. The small size of the individual operations was a notable feature of the industry. In 1953, of a total production of 233,629 tons, 149,479 tons came from 3 mines of the Cornwall Coal Co. Production at any one of all the other collieries was less than 30,000 tons per year. By 1955, output per man per year had been increased to 794 tons, and the Chief Inspector of Mines reported that the Duncan colliery at Fingal was almost entirely mechanized. In 1959, production per man year was 1355 tons for underground employees and 975 overall; the production cost was little more than in 1955. Production in 1960 amounted to 301,000 tons but thereafter declined due to competition from fuel oil, and had fallen to 102,457 tons by 1965. The largest mine operating produced 78,650 tons at an annual rate of 1542 tons/man year. This mine was working a four shift week, with the fifth for maintenance.

Increases in productivity in the Tasmanian industry are shown in Table 11, though there is such a variation in conditions and size of collieries, that the figures are of limited value.

SIZE OF LABOUR FORCE

Table 15 (Joint Coal Board) demonstrates the variation in the number of mine workers employed in the production of black coal in Australia. The picture is one of a general decrease over the last ten to fifteen years in all States except South Australia, where employment has been relatively constant. This reflects a general increase in productivity in all States except Victoria, coupled with a general running down of the industry in that State, and in Tasmania. The increased proportion of production by open cut in Queensland is responsible for a portion of the apparent overall increase in productivity in recent years in that State.

In most cases the miners displaced by the inroads on available markets of petroleum products and increased productivity were absorbed readily by other mines or by expansion in other industries in the expanding economy. Perhaps the area hardest hit by unemployment wasthe South Maitland (Cessnock) district of the Northern Coalfield of New South Wales. The coal mined was only suitable for steam raising and gas making and was particularly susceptible to competition from petroleum. Opportunities for employment, other than in coalmining, were few. The number of mineworkers in this area was reduced by 800 to 1400 over the three years to June 1964.

The problem generally was met by the colliery proprietors giving as much notice as possible of impending colliery closures. Mineworkers were encouraged to take long service leave and to retire as soon as the retiring age was reached. Re-employment committees were set up with representatives of the Commonwealth Employment Service, the Joint Coal Board, the colliery proprietors and the mining unions, and these were effective in most areas in reducing the hardship caused by colliery closures.

With the Board's assistance, some transfers were made to the Southern Coalfield where there were plenty of vacancies. Because of the absence of local employment opportunities most of these transfers were from the Western coal field. Alternative employment was available in the Newcastle area and public works provided jobs in the Cessnock area which acted as a cushion of available employment for displaced miners on this part of the Northern Coalfield. Improved transport facilities between Cessnock and Newcastle made it possible for larger numbers of displaced Cessnock miners to take advantage of employment vacancies in the Newcastle area without moving from their homes.

COSTS AND PRICES

i) New South Wales

The information published by the Joint Coal Board Annual Reports provides a good basis for following the changes in coal costs and prices in this state.

The Joint Coal Board's first report indicated that the coal price structure in 1947-48 was badly in need of rationalization. The Commonwealth had paid a subsidy for increased costs incurred as part of the war-time price stabilization scheme, by which coal prices were pegged at the levels ruling on 12th April 1943.

In addition pre-war prices were extremely uneven and often illogical, as a result of technical, economic and commercial conditions. There were differences in prices between collieries as well as between coal of different sizes from the same colliery. Moreover, the price of coal of the same size from the same colliery sometimes varied according to the customer to whom it was sold.

On its establishment the Board took over the authority for fixing coal prices and initiated action to eliminate the war-time subsidy so as to restore to colliery proprietors the incentive for low cost production. The Board also set about rationalizing the complex pricing structure. By the end of June 1950 a single price had been established for almost all the producers and subsidy payments had been eliminated. Table 16 (Joint Coal Board) shows the increase in average colliery f.o.r. prices by district from 1947 to 1954. Table 17 (same source) sets out the changes in average prices for the State since 1948 and by districts for the period 1963-1966.

It should be noted that money values in some of the tables are expressed in shillings and pence. Decimal currency was introduced in Australia in February 1966. The relationship between the two currencies may be expressed as follows: 1 dollar (Australian) is subdivided into 100 cents and equals ten shillings (old currency). The old currency unit was the pound (Australian) which was subdivided into twenty shillings, each shilling being further divided into twelve pence.

In 1952 the Board announced a new pricing policy which, in general, provided for prices to be fixed for each colliery based on certified accounts for production costs. The profit margin was to be 60 cents (6 shillings) per ton or such greater margin as was required to yield a return of 25 per cent on capital employed on coal production before providing for income tax, depreciation or amortization. It was hoped that this action, coupled with the Commonwealth Government's liberalization of income tax legislation to bring to coal mines the same concessions enjoyed by other mines, would give colliery proprietors an incentive to undertake the mechanization and re-organization of their mines necessary to place them on a sound economic footing. In many cases, price loadings were granted to individual companies for limited periods to ensure a build up of company funds for these purposes.

A price differential between large and small coal from the South Maitland district (Greta seam) was introduced in 1953/54. It rose to $1.00 (10 shillings) per ton in several mines in 1954/55 and to as much as $3.40 (34 shillings) in October 1955. Without this price differential small Maitland coal could not compete with small coal from other districts and the large Maitland coal, required for railway locomotives and town gas production, would not have been produced. The higher price for large coal provided an incentive to minimize production of small coal.

A major step forward in 1954/55 was the negotiation for the first time of contracts with major consumers (particularly in Victoria and South Australia) for the long term supply of particular types and grades of coal. The New South Wales Government Railways and Electricity Commission also began to follow this practice.

In 1954, as a result of a reduction in company taxation rates, the profit margin in the price fixing formula mentioned above was reduced to 50 cents (5 shillings) per ton or 20.833 per cent of shareholders' funds, whichever was the greater.

By 1956/57 it was apparent that the new pricing policy adopted by the Board had been successful, in that in spite of rising labour and other costs, the average coal price for New South Wales had not risen, but rather had declined. Increasing competition for available markets meant that prices fixed by the Board were becoming maximum prices. Discounts were offered in many cases to meet the competition, which was often from petroleum products. By 1961/62 this competition was regarded by the Board as a very significant factor, particularly in Victoria and South Australia, where transport costs reduce the competitive strength of New South Wales coals. The South Maitland district was particularly vulnerable to competition from petroleum products. Refer to the earlier discussion under the heading "Size of Labour Force".

The cost of coal production is set out in detail since 1954 in Table 18 (Joint Coal Board). It should be noted that in this table, Item 19 includes costs and other items not separately listed such as interest, rent, rates, land tax, depreciation, income tax and net profit. Totals of wages, salaries, and wages-on-cost remained a more or less constant percentage of total production cost over the period 1954-59, increases in wage rates being compensated for by increases in productivity. The value per ton of saleable output represents the average for the whole output of the year in question and is therefore different from that shown in other tables as the average price as at 30th June. Over the five years 1955 to 1960 there was a fall of 11½ percent in the average value of coal per ton produced, and in addition, over the same period, the quality of coal sold was greatly improved by the raising of standards of coal preparation to a high level.

There was a sharp increase in the total cost of repairs and materials other than electricity, fuel and explosives in 1961; probably reflecting the great increase in mechanical equipment introduced to the industry in the previous few years, and the inevitable increase in maintenance on such equipment as time goes on. Another increase was experienced in 1962 serving to emphasize the importance that close supervision of maintenance costs was assuming in attempts to reduce overall costs of coal production in a buyers' market.

Further evidence of pressure on prices was given by the 1963 cost structure analysis which indicated a sharp reduction in that portion of cost which is not dissected in detail (item 19) and which includes provision for both depreciation and profit.

In the last few years, maintenance costs have held relatively steady and there has been an encouraging increase in the balance item which is available for depreciation and profit. Both total value, and the wages element of the value, have shown decreases due to increased productivity.

(ii) Queensland

Control of coal prices was vested in the Queensland Coal Board on its establishment in 1949. A similar complicated price structure to that in New South Wales existed at this time. The Queensland Coal Board introduced "district prices" for the Bundamba and Rosewood districts of the West Moreton coalfield which were the two most adversely affected by the old price structure.

The Board instituted a system of halfyearly returns of detailed costs of production, distribution and administration from each colliery. These returns were summarized and reviewed on a district basis. Where appropriate, allowances to provide for developmental expenditure (on much needed mechanization and reorganization) were made in determining certain of the "district prices". The principles of the system had much in common with the principles of that introduced by the Joint Coal Board in New South Wales in 1951/52. Details of price increases in 1949-1952 are set out in Tables 19 and 20 (Queensland Coal Board). The Queensland Coal Board was still setting maximum selling prices for coal in accordance with fluctuations in costs in 1965/66.

Details of production costs are not published by the Queensland Coal Board. However, the same broad trends noted for New South Wales would have applied also in Queensland. Table 21, compiled from Australian Mineral Industry Annual Reviews, shows the variation in average ex-mine value over the period 1950-1965.

(iii) Other States

In view of the lack of detailed data on other states and the small size of their production relative to that of New South Wales and Queensland, there is little comment to be made on cost and price trends. Production is often by captive mines for public utility markets, and in these cases the element of price competition is lacking.

Table 21 shows the ex mine value of black coal produced in various states from 1950/1965. Table 6 shows the ex mine value of brown coal produced in Victoria from 1953 to 1965. Although these figures for ex mine value may not necessarily equate directly with prices or costs because of differing bases of collection, they do give an indication of price and cost trends in the various states.

HOME SALES TO VARIOUS CONSUMERS AND EXPORTS

(i) New South Wales

Table 22 (Joint Coal Board) shows the average weekly consumption of New South Wales coal by New South Wales industries from 1951/52 to 1965/66.

Table 23 (same source) shows a simplified breakdown by industries and exports as well, for New South Wales coal by district of production from 1963/64 to 1965/66.

Table 24 (same source) shows the extent to which colliery production was captive to the basic industries of New South Wales from 1950 to 1962 and 1963/64 to 1965/66.

The main trend to be deduced from these statistics is the decrease in proportion of coal production used by individual industries and railway locomotives (due to competition from petroleum products) and the increased proportion taken up by basic requirements such as electric power generation and iron and steel production.

An increase in open cut production from the Northern Coalfield can be expected in the future. It is anticipated that a large proportion of the coal required by the projected Liddell Power Station will be drawn from opencut mines established nearby. The station has a designed capacity of 2000 megawatt and will require up to 5 million tons of coal per year. The first boiler is expected to be commissioned about the end of 1970. Improved coal exporting facilities in the port of Newcastle will improve the competitive position of the Northern Coalfield open cut mines in export markets.

Export sales of coking coal to Japan began in 1956 with a modest shipment of 10,000 tons in July of that year. Exports reached 555,000 tons in 1956/57, the highest total since 1926/27. About 0.75million tons were exported in 1957/58 and 1958/59 and expansion has been continued at an accelerated rate since that time.

Details of coal exports from New South Wales in recent years are set out on Table 25 (Joint Coal Board). Japan is by far the largest customer for New South Wales coal. Small shipments to a number of countries make up the balance. The largest of these is to New Caledonia; where coking coal from the Burragorang Valley is used for nickel smelting operations.

All Northern Coalfield coal is exported from Newcastle; Burragorang Valley coal is shipped through Balmain (Sydney) while other mines in the Southern-South Western Coalfield export through Port Kembla. Large and modern loading facilities have been installed at all three ports, and where appropriate, action has also been taken to provide access to these facilities for bulk carriers of greater size than was previously possible. The successful development of the export trade has been dependent in no small measure upon this improvement in facilities to take advantage of the lower freight rates associated with larger ships and rapid turn around.

Interstate shipments of New South Wales coal tended to fall off only slightly up to about 1959-60, but have fallen off fairly rapidly since then. Table 26 (Joint Coal Board) gives details of these exports since 1947/48. Some of the fluctuations in interstate shipments in the early period recorded on the table were due to industrial difficulties on the N.S.W. Coalfields at that time. Other states tended to take whatever action they could to become independent of N.S.W. coal. This included development of their own coal deposits for power generation, and a ready acceptance of petroleum products as alternatives to coal for general industrial and transport purposes, and in town gas production.

(ii) Queensland

Table 13 (e) (ii) gives details of Queensland coal consumption within the State. The same general trend is apparent in Queensland as in New South Wales. There is a declining use of coal in most industrial situations where petroleum products compete, but an increase in consumption for power generation and in exports of coal, principally to Japan.

Three major power stations have been or are still being constructed on coalfields in recent years. Calcap, of 150 megawatt capacity on the Callide coalfield is serving the central area of Queensland; Swanbank, of 360 megawatt total capacity is built on the West Moreton coalfield for Brisbane and the southern area generally, while Collinsville, 180 megawatt capacity when completed, will supply power to the northern area from the Bowen coalfield.

Details of exports 1949/50 to 1965/66 are set out on Table 27. (Queensland Coal Board). Major development of the Port of Gladstone and railway lines linking it with coal reserves at Moura and Blackwater has played an essential part in the development of the export trade in coking coal to Japan. This is being undertaken by such companies as Thiess Peabody Mitsui Pty. Ltd. and Utah Development Company. The Utah company is expected to commence shipments in 1968; Thiess Peabody Mitsui should be exporting at a rate of 2.8 million tons per year by that time. 1965 exports by this company were 1.459 million tons.

(iii) Victoria

Consumption of brown coal was expected to increase over the period 1965-1969 by 7 million tons in power stations alone. The pattern of brown coal consumption in 1954/55 is compared with that in more recent years in Table 28. (B.M.R. , 1965).

In 1953/54 briquette consumption was 612,000 tons of which 60 percent went to State Electricity Commission power stations, 32½ percent to industry generally and 7½ percent for domestic purposes.

After stock adjustment, 1964/65 briquette production was estimated to be approximately 1.891 million tons, of which 33 percent was consumed by State Electricity Commission power stations and 29 percent by general industry of which the largest group was dairying. Other food processing, textile and paper manufacture, engineering and automotive plants, the ceramics industry and hospitals and institutions all contributed to the general industry total though individually they were of less importance. A total of 28 percent was used for domestic purposes and 9 percent by the Gas and Fuel Corporation's plant at Morwell. This plant commenced production of Lurgi gas from brown coal briquettes in 1956. It was erected in order to reduce Melbourne gas supply's dependence on supplies of gas coal from New South Wales.

(iv) Western Australia

All Western Australian production is used within the State, principally by public utilities. Some coal is imported from New South Wales for gas making. Recent attempts have been made to develop an export market for char made from Collie coal which has been found to be a highly reactive form of carbon.

In 1950 the railways consumed 45.6 percent and electricity generation 37.4 percent of total Western Australian production. Cement works consumed about 5 percent and industry generally the remaining 12 percent. By 1953 the railways share was 42 percent, electricity generation 38.5 percent, cement works 7.5 percent and industry generally remained at 12 percent, indicating a growth in the consumption of coal for power generation and cement manufacture relative to other uses.

By 1955 competition from petroleum products was having a marked effect in fields other than power generation. Railways took 35 percent of that year's production, power generation 50 percent, cement works 7 percent and general industry 8 percent. Cement works ceased using coal in favour of oil fuel in 1955.

Over the period 1953 to 1957, when there was a total decrease in annual consumption of 5 percent, railway consumption fell by 27 percent, cement works by 100 percent and private consumers (industry generally and domestic) by 44 percent. Electric power generation requirements at Collie, Bunbury, Perth metropolitan area and Kalgoorlie increased substantially. In 1957 and subsequent years a small tonnage of Collie coal (17,000-25,000 tons per year) was used for gas making by the State Electricity Commission.

Details of consumption are not available after 1959, but the general trend has been towards the replacement of coal by petroleum products in railways and industry generally, with a concentration of consumption in the electricity generation field. A large modern power station is being built in stages at Collie to use open cut coal from the nearby Muja area. Capacity when completed will be 240 megawatt.

(v) South Australia

Although supplies of Leigh Creek coal were used also for railways, gas making (as a blend) and general purposes in the early period when New South Wales supplies were unreliable, the main use has been for power generation, initially in stations near Adelaide, but more recently in a specially deisgned power station near Port Augusta. The 3 ft. 6 in. gauge railway between Port Augusta and Leigh Creek was changed to standard (4 ft. 8½ in.) gauge and realigned and regraded to lower transport costs for Leigh Creek coal.

(vi) Tasmania

There have been no exports of coal from Tasmania.

The various deposits of the island do not contain coking or gas making coal, and production has been on the basis of satisfying local demand for industry

and railways. Development of the island's hydroelectric potential has eliminated any demand for local coal by thermal power stations. Coal interests had canvassed the possibility of such a station for some time and the question was reviewed by a Government Board of Inquiry in 1961/62; the conclusion reached was that a thermal power station would be uneconomic.

Details of consumption are not available. The first coal washeries were installed in 1960/61 and it was at this time that competition for available markets from petroleum products began to be felt. Production declined rapidly, particularly with the conversion of one of the principal consumers, Australian Pulp and Paper Mills Ltd, at Burnie, to oil fuel. At a later date, Goliath Portland Cement at Railton also changed over to oil fuel, and closed their colliery in the Fingal area.

ORGANIZATION OF THE INDUSTRY - INFLUENCE OF GENERAL ECONOMIC POLICY

Probably discussion under this heading has been covered at least partially in the preceeding sections.

In New South Wales, the principal feature of the industry since 1950 has been the continuation of the Joint Coal Board's efforts to establish the industry on an efficient basis. That they have been successful is revealed by Mr. Heywood Wilkinson's remarks on the occasion of his being awarded the Gold Medal of the Australasian Institute of Mining and Metallurgy in 1967. He said "... the industry had doubled its production and dropped its manpower by one-third which is a measure of what we have done during that period." The period referred to was 1950 to 1967. Mr. Wilkinson (General Superintendent of Collieries for B.H.P. Co. Ltd. and A.I.S. Ltd.) also pointed out that following the losses of industrial, railway and gas coal markets to South Australian and Victorian domestic coal fuels and to petroleum products, all sections of the industry realized that New South Wales black coal had lost its previously held monopoly of the Australian fuel market for all time. This served as an added incentive toward co-operation of all sections of the industry with the Joint Coal Board in the successful re-organization.

A more recent feature of the New South Wales Industry is the expansion of the operation of collieries by the States Mines Control Authority and the New South Wales Electricity Commission for supplying coal to thermal power stations. Other changes in ownership of collieries have taken place, and particularly in the case of coal production for overseas export, group holdings of collieries by overseas capital is tending to replace the smaller Australian owned colliery companies operating one or two collieries only.

There has been a trend apparent in Queensland away from the large number of very small collieries to fewer larger mechanized collieries often with washeries attached. The Queensland Government has withdrawn completely from mine ownership in recent years. For the export trade, large open cut mines have been and are being opened in Central Queensland, largely with overseas capital.

In South Australia, the sole producer is a State owned instrumentality, the State Electricity Commission. The main feature of the industry has been an increase in size of equipment and production tonnage as the State's demand for electricity has increased.

In Tasmania, a number of collieries were opened on a fairly small scale to meet the demands of the railways and individual industries. These have tended to close down with increased replacement of coal by petroleum products, both as industrial fuels and by dieselization of railways. The development of Tasmania's considerable hydro-electric potential has rendered construction of thermal power stations, based on domestic or imported coal economically unattractive. At the present time, prolonged drought in Tasmania has made it necessary to ration hydro electric power, and it is reasonable to expect that the State may consider re-examination of the value of at least one thermal power station feeding the State grid system.

THE FUTURE OF THE INDUSTRY

Recent discoveries of oil and natural gas in Australia can be expected to have the effect of still further curtailing the market for coal for gas making and general industrial purposes.

Future coal markets lie in the fields of power generation, metallurgical industries (principally iron and steel) and export.

In most states power stations are being located where favourable combinations of low cost coal, either from open cut or underground mines, are within reach of adequate supplies of cooling and boiler feed water and not too far away from major centres of energy consumption. Practically all new large thermal plants have been built by the State Government owned utilities, and this pattern is expected to continue. It was expected in 1965 that the demand for power would increase by 150 percent in the next ten years, when the proportion of black coal production used for electricity generation could rise to 60 percent.

Oil and natural gas and atomic energy are the three main potential competitors for coal's share of the electricity generating market. It appears likely that they will be successful to a limited extent in meeting demands in areas removed from the main sources of coal, where adequate water supplies present particular problems, or where refinery by-products and residuals are available cheaply because of limited alternative uses.

In the case of the metallurgical industries, coking coal supplies are known in quantity only in New South Wales and Queensland. Some of the companies developing iron ore deposits in Western Australia have undertaken to examine the feasibility of establishing an iron and steel industry based on these deposits. At the present time it seems that any such industry depending on blast furnace production of pig iron as its starting point will have to import coke or coking coal from the east coast.

There are a variety of processes for producing an iron feed suitable for steelmaking other than the well established blast furnace method using coke as a source of fuel and reductant. It would be technically possible to use Collie coal or char in some of these processes, and the Western Australian Government is naturally keen to see local raw materials used as much as possible. It has recently expressed willingness to assist in reducing the transport cost of Collie coal or char to the North-West, , as present freight rates appear high enough to make its use unlikely. In the final analysis, the choice of raw materials will depend on technical and economic factors modified by the anticipated scale of production.

With only a modest scale of operation the choice might well rest between direct reduction methods using Collie coal or char, or petroleum and natural gas. If a large production is anticipated, direct reduction processes based on Western Australian sources of fuel and reductant mentioned above may be hard put to compete with a blast furnace operation based on coke or coking coal from eastern Australia handled in large bulk carriers.

Some companies are considering the production of partially reduced pellets for the export market and this type of operation offers some scope for the use of Collie coal if it can be delivered cheaply enough to compete with coal from the east coast.

The main export market for coal is Japan, and this state of affairs appears likely to continue for the foreseeable future. In the past Japan's main requirement has been for high quality hard coking coal, to use in blends with domestic supplies of soft coking coal. Premium prices are paid for suitable material from the U.S.A., Canada and Australia. It seems possible that in the future, although premium grade coking coal will continue to make up by far the greatest proportion of sales to Japan, there may also be some increase in the quantity of gas and steam raising coal that is exported to Japan as well as other countries. The U.S.A. and Canada seem likely to continue to be the main competitors for the Japanese trade. Australia's share was 44.2 percent of Japan's coking coal imports in the calendar year 1966.

Some contracts held at the present time may be of interest;

Utah Development Company - from Blackwater, Queensland, 21.4 million tons of coking coal to 1977.

Thiess, Peabody, Mitsui Pty. Ltd., Moura, Queensland, 49.6 million tons of coking coal to 1978.

Other contracts for additional coal from Central Queensland, as well as the Northern and Southern Coalfields of New South Wales are also being negotiated.

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TABLE 1 - SELECTED COAL ANALYSES

Coal	Moisture %	Volatile Matter %	Fixed Carbon %	Ash %	Sulphur %	British Swelling Number	Calorific Value B.T.U./lb
N.S.W.							
Newcastle (Coking)	2	32-34	54-56	8-12	0.5-1.0	4-5	12,500-12,800
Newcastle (non-coking)	2	29-32	53-54	12-16	0-4	1.5 - 2.5	12,000-12,400
Cessnock-Maitland	2	39-42	49-50	6-10	0.6-1.0	3.5 - 4.0	13,000-13,800
Muswellbrook-Singleton	2.5	37.5-39.5	50.5	7.5-9.9	0.7	4.5 - 5.5	13,000-13,500
Western District	2	29-33	51-52	13-18	0.7	1.5 - 2.5	11,000-12,000
Southern and South-western	1	22-28	62.5-65.5	8.5-11.5	0.4	5.5 - 7.0	13,000-14,000
Tamworth-Gunnedah	2.5	36-37	51.5-52.5	8-10	0.5	3.5 - 5.5	12,500-13,000
Ashford	1	23-26	60-61	12-16	0.4	2.5	12,500-13,500
Far North Coast	1	24-25	51-55	20-23	0.4	3-5	11,700-12,500
VIC.							
Yallourn-Raw Brown Coal	65.5	17.5	16.3	0.7			*2,987
Yallourn-Briquettes	13.0	44.8	40.4	1.8			*9,090
TAS.							
Duncan-Fingal	4.2	26.2	46.8	22.8	0.3		10,250
Cornwall	6.4	24.5	64.5	22.3	0.3		10,250
Stanhope	3.1	30.3	48	18.2	0.4		11,500
Sandfly	3	9	63	24	0.5		10,300
TAS. (washed)							
Duncan-Cornwall	4.3	26.2	49.9	19.6			11,000
Merrywood	5.3	27.8	47.1	19.5			10,800
Stanhope	3.3	29.8	48.6	18.0			12,120
W.A. (Collie)							
Western No. 2	28.3	26.2	41.6	3.0			8,703
Hebe	28.7	26.4	43.1	1.8			8,930
Muja Open Cut	27.6	27.1	42.9	2.4			8,970

* Net

TABLE 2 - PRODUCTION OF BLACK COAL ('000 tons) - BY STATES

AUSTRALIA

(Figures prior to 1942 are based on tonnages supplied by the Mines Departments of the respective States.)

Year	N.S.W. (a)	Victoria	Queensland	South Australia	Western Australia	Tasmania	Australia
1922	10,183	560	959	..	438	69	12,209
1923	10,479	477	1,061	..	421	81	12,519
1924	11,618	518	1,123	..	422	76	13,757
1925	11,396	534	1,177	..	437	82	13,626
1926	10,886	591	1,221	..	475	102	13,275
1927	11,126	684	1,099	..	502	112	13,523
1928	9,448	658	1,076	..	528	129	11,839
1929	7,618	704	1,369	..	545	130	10,366
1930	7,093	703	1,095	..	501	139	9,531
1931	6,432	571	841	..	432	124	8,400
1932	6,784	432	842	..	416	112	8,586
1933	7,118	523	876	..	458	117	9,092
1934	7,873	357	957	..	500	114	9,801
1935	8,699	476	1,052	..	537	124	10,888
1936	9,199	427	1,047	..	565	132	11,370
1937	10,052	258	1,120	..	554	91	12,075
1938	9,571	307	1,113	..	605	84	11,680
1939	11,196	365	1,317	..	558	99	13,535
1940	9,550	268	1,285	..	539	83	11,725
1941	11,766	326	1,454	..	557	110	14,213
1942	12,206	311	1,722	..	587	124	14,950
1943	11,474	286	1,732	..	529	143	14,164
1944	11,043	257	1,689	34	568	146	13,737
1945	10,176	245	1,638	41	547	146	12,793
1946	11,186	192	1,569	137	644	158	13,886
1947	11,683	179	1,887	179	731	160	14,819
1948 (b)	11,722	174	1,756	249	743	181	14,825
1949	10,736	133	1,971	337	752	178	14,107
1950	12,798	137	2,326	259	817	211	16,548
1951	13,513	146	2,481	394	849	235	17,618
1952	15,022	143	2,757	416	827	245	19,410
1953	14,174	152	2,533	448	880	236	18,423
1954	15,084	141	2,749	493	1,021	265	19,753
1955	14,736	132	2,763	459	908	298	19,296
1956	14,810	120	2,719	483	838	300	19,270
1957	15,390	116	2,663	606	839	265	19,879
1958	15,851	111	2,578	746	872	277	20,435
1959	15,712	90	2,593	709	914	300	20,318
1960	17,737	84	2,661	883	922	301	22,588
1961	19,021	67	2,809	1,114	766	262	24,039
1962	19,030	54	2,813	1,395	919	271	24,482
1963	18,940	51	3,245	1,518	908	198	24,860
1964	20,699	48	3,814	1,736	982	150	27,429
1965 (b)	24,130	41	4,191	1,983	994	99	31,438
1966-1st half ...	11,848	16	2,299	996	500	41	15,700
1947-48 (b)	11,918	182	1,758	208	734	169	14,969
1948-49	11,647	149	1,973	291	762	189	15,011
1949-50	11,293	140	2,181	308	785	186	14,893
1950-51	12,683	132	2,253	317	837	212	16,434
1951-52	14,733	144	2,666	424	883	251	19,101
1952-53	14,264	152	2,676	414	767	241	18,514
1953-54	14,926	144	2,597	470	950	244	19,331
1954-55	14,599	141	2,777	494	975	280	19,266
1955-56	14,554	122	2,659	450	872	297	18,954
1956-57	15,230	118	2,749	524	842	282	19,745
1957-58	15,654	117	2,588	709	852	267	20,187
1958-59	15,762	98	2,597	724	904	292	20,377
1959-60 (c)	17,076	89	2,722	765	939	310	21,901
1960-61	18,163	78	2,598	1,003	741	290	22,873
1961-62	19,083	58	2,904	1,227	930	253	24,455
1962-63	18,725	53	2,888	1,472	933	239	24,310
1963-64	20,238	49	3,668	1,606	917	177	26,655
1964-65	21,814	46	3,895	1,909	959	127	28,750
1965-66 (b)	25,011	38	4,580	2,011	1,059	93	32,792

(a) The figures quoted for New South Wales production prior to 1942 are Mines Department gross outputs. The deduction made for dirt and chitter in the First Report of the Joint Coal Board has not been continued.

(b) 53-week year. (c) 54-week year.

TABLE 3 - PRODUCTION OF BLACK COAL ('000 tons) - NEW SOUTH WALES DISTRICTS

Year or Period	UNDERGROUND MINES						OPEN CUTS						TOTAL	No. of Working Days in Year or Period (b)	Average Production per Working Day
	Cessnock-N.W.	Newcastle	Total North	West	South	N.S.W.	Cessnock-N.W.	Newcastle	Total North	West	South	N.S.W.	N.S.W.		
1941 (a)	n.a.	n.a.	7,891·1	1,565·5	2,242·5	11,699·1	...	...	...	66·6	...	66·6	11,765·7	n.a.	n.a.
1942	5,082·7	3,218·7	8,301·4	1,586·6	2,261·1	12,149·1	...	...	...	56·8	...	56·8	12,205·9	255	47·9
1943	4,723·6	3,100·7	7,824·3	1,438·4	2,150·6	11,413·3	...	...	...	60·2	...	60·2	11,473·5	254	45·2
1944	4,334·8	2,989·4	7,324·2	1,533·4	2,005·6	10,863·2	11·2	...	11·2	168·5	...	179·7	11,042·9	253	43·6
1945	3,773·4	2,667·1	6,440·5	1,437·5	1,775·2	9,653·2	334·3	...	334·3	188·8	...	523·1	10,176·3	247	41·2
1946	4,109·9	3,066·7	7,176·6	1,515·3	1,738·1	10,430·0	513·5	...	513·5	242·9	...	756·4	11,186·4	248	45·1
1947	4,024·3	3,301·5	7,325·8	1,482·7	1,915·9	10,724·4	536·8	16·8	553·6	405·1	...	958·7	11,683·1	251	46·5
1948 (c)	3,957·3	3,189·2	7,146·5	1,397·8	1,922·5	10,466·8	618·6	16·5	635·1	619·5	...	1,254·6	11,721·4	248	47·2
1949	3,235·4	2,956·1	6,191·5	1,289·1	1,908·0	9,388·6	534·3*	94·4*	628·7*	718·8*	...	1,347·5*	10,736·1*	(Nth.235 (Rest 240	45·3*
1950	3,685·7	3,708·9	7,394·6	1,406·9	2,395·1	11,196·6	715·1	216·8	931·9	661·5	8·2	1,601·6	12,798·2	(Nth.244 (Rest 239	52·8
1951	3,485·2	3,828·7	7,313·9	1,404·8	2,505·5	11,224·2	1,026·5	217·3	1,243·8	1,042·2	2·9	2,289·0	13,513·2	238	56·8
1952	3,784·3	4,444·1	8,228·4	1,487·7	2,775·8	12,491·9	1,157·8	240·3	1,398·1	1,132·1	...	2,530·2	15,022·1	239	62·9
1953	3,948·7	4,007·3	7,956·0	1,487·0	3,008·7	12,451·7	973·9	112·6	1,086·5	635·6	...	1,722·1	14,173·8	240	59·1
1954	4,244·3	4,382·4	8,626·7	1,710·1	3,366·9	13,703·7	878·3	41·3	919·6	460·4	...	1,380·0	15,083·7	243	62·1
1955	4,086·6	4,397·0	8,483·6	1,756·5	3,594·7	13,834·8	804·3	1·8	806·1	95·5	...	901 6	14,736·4	239	61·7
1956	4,149·6	4,210·6	8,360·2	1,658·0	3,981·4	13,999·6	810·5	0·1	810·6	...	...	810·6	14,810·2	239	62·0
1957	4,036·0	4,444·3	8,480·3	1,626·2	4,555·6	14,662·1	728·1	...	728·1	...	...	728·1	15,390·2	239	64·4
1958	4,010·6	4,852·7	8,863·3	1,574·2	4,693·1	15,130·6	720·3	...	720·3	...	...	720·3	15,850·9	239	66·3
1959 (d)	3,491·0	5,413·0	8,904·0	1,562·4	4,811·8	15,278·2	434·2	...	434·2	...	...	434·2	15,712·4	240	65·5
1960	3,916·6	5,752·1	9,668·7	1,577·5	5,735·4	16,981·6	755·4	...	755·4	...	...	755·4	17,737·0	244	72·7
1961	3,880·7	5,664·6	9,545·3	1,585·9	7,057·4	18,188·6	832·2	...	832·2	...	...	832·2	19,020·8	234	81·3
1962	3,886·8	5,337·2	9,224·0	1,517·6	7,454·3	18,195·9	834·5	...	834·5	...	...	834·5	19,030·4	234	81·3
1963	3,038·8	5,843·2	8,882·0	1,638·8	7,817·0	18,337·8	602·4	...	602·4	...	...	602·4	18,940·2	228	83·1
1964	3,153·0	6,841·1	9,994·1	1,594·0	8,394·6	19,982·7	716·4	...	716·4	...	...	716·4	20,699·1	232	89 2
1965 (c)	4,022·7	7,848·9	11,871·6	1,686·6	9,676·4	23,234·6	895·4	...	895·4	...	...	895·4	24,130·0	236	102·2
1966–1st half	1,957·5	3,898·2	5,855.7	755·9	4,718·7	11,330·3	517·1	...	517·1	...	...	517·1	11,847·4	112	105·8
1947–48 (c)	4,069·3	3,238·4	7,307·7	1,421·6	2,063·7	10,793·0	581·4	24·9	606·3	518·4	...	1,124·7	11,917·7	250	47·7
1948–49	3,768·1	3,229·9	6,998·0	1,415·2	1,904·7	10,317·9	638·6	22·6	661·2	668·3	...	1,329·5	11,647·4	244	47·7
1949–50	3,317·9	3,247·0	6,564·9	1,311·0	2,015·1	9,891·0	550·6*	156·7*	707·3*	695·0*	...	1,402·3*	11,293·3*	239	47·3*
1950–51	3,481·7	3,606·6	7,088·3	1,334·1	2,449·4	10,871·8	822·1	225·6	1,047·7	752·9	11·1	1,811·7	12,683·5	238	53·3
1951–52	3,688·3	4,258·4	7,946·7	1,477·0	2,644·5	12,068·2	1,135·6	261·o	1,397·2	1,268·1	...	2,665·3	14,733·5	239	61·6
1952–53	3,787·1	4,032·5	7,819·6	1,486·4	2,878·1	12,184·1	1,064·4	170·9	1,235·3	844·8	...	2,080·1	14,264·2	240	59·4
1953–54	4,164·5	4,398·2	8,562·7	1,592·4	3,193·2	13,348·3	961·6	78·0	1,039·6	538·0	...	1,577·6	14,925·9	238	62·7
1954–55	4,015·7	4,333·0	8,348·7	1,725·1	3,424·3	13,498·1	780·3	9·8	790·1	310·6	...	1,100·7	14,598·8	239	61·1
1955–56	4,137·3	4,179·9	8,317·2	1,696·1	3,685·8	13,699·1	849·4	1·9	851·3	3·4	...	854 7	14,553·8	239	60·9
1956–57	4,152·5	4,325·1	8,477·6	1,654·5	4,333·2	14,465·3	764·5	...	764·5	...	...	764·5	15,229·8	239	63·7
1957–58	4,101·5	4,560·5	8,662·0	1,579·9	4,625·7	14,867·6	786·8	...	786·8	...	...	786·8	15,654·4	239	65·5
1958–59	3,715·1	5,252·3	8,967·4	1,604 2	4,715 1	15,286·7	475·3	...	475·3	...	...	475·3	15,762·0	240	65·7
1959–60 (d)	3,751·4	5,774·6	9,526·0	1,592·7	5,370·9	16,489·6	586·6	...	586·6	...	...	586·6	17,076·2	249	68·6
1960–61	3,987·5	5,569·4	9,556·9	1,558·9	6,239·5	17,355·3	807·5	...	807·5	...	...	807·5	18,162·8	234	77·6
1961–62	3,858·1	5,565·1	9,423·2	1,543·4	7,166·9	18,133·5	949·5	...	949·5	...	...	949·5	19,083·0	234	81·6
1962–63	3,424·6	5,384·8	8,809·4	1,585·0	7,709·3	18,103·7	621·2	...	621·2	...	...	621·2	18,724·9	234	80·0
1963–64	3,105·7	6,506·8	9,612·5	1,632·6	8,355·4	19,600·5	637·6	...	637·6	...	...	637·6	20,238·1	232	87·2
1964–65	3,426·2	7,203·7	10,629·9	1,610·2	8,697·8	20,937·9	875·7	...	875·7	...	...	875·7	21,813·6	231	94·4
1965–66 (c)	4,231·1	8,150·8	12,381·9	1,669·1	9.993·5	24.044·5	966·0	...	966·0	...	...	966·0	25,010·5	236	106·0
1965—															
Period 1	144·8	309·5	454·3	60·3	369·6	884·2	47·1	...	47·1	...	...	47·1	931·3	10	93·7(e)
2	272·5	588·5	861·0	128·8	749·3	1,739·1	75·1	...	75·1	...	...	75·1	1,814·2	19	95·5
3	293·9	632·3	926·2	142·2	767·8	1,836·2	85·8	...	85·8	...	...	85·8	1,922·0	20	96·1
4	294·7	603·9	898·6	133·0	729·3	1,760·9	71·1	...	71·1	...	...	71·1	1,832·0	19	96·4
5	227·0	469·9	696·9	103·7	635·1	1,435·7	57·3	...	57·3	...	...	57·3	1,493·0	15	100·9(e)
6	347·2	672·0	1,019·2	137·3	784·8	1,941·3	80·4	...	80·4	...	...	80·4	2,021·7	20	101·1
7	342·7	661·9	1,004·6	138·9	792·0	1,935·5	62·8	...	62·8	...	...	62·8	1,998·3	19	105·2
8	324·2	680·7	1,004·9	137·5	856·6	1,999·0	64·7	...	64·7	...	...	64·7	2,063·7	20	103·2
9	276·7	549·2	825·9	148·7	790·0	1,764·6	55·8	...	55·8	...	...	55·8	1,820·4	17	107·1
10	371·1	663·2	1,034·3	118·5	751·0	1,903·8	78·6	...	78·6	...	...	78·6	1,992·4	18	109·6(e)
11	367·5	617·5	985·0	139·3	849·9	1,974·2	69·0	...	69·0	...	...	69·0	2,043·2	19	107·5
12	370·0	692·1	1,062·1	152·3	744·2	1,958·6	68·2	...	68·2	...	...	68·2	2,026·8	20	101·3
13	390·3	707·4	1,097·7	146·1	856·6	2,100·4	79·5	...	79·5	...	...	79·5	2,179·9	20	109·0
1 week...	0·1	0·8	0·9	...	0·2	1·1	...	...	...	...	...	...	1·1	...	...
1966—															
Period 1	189·0	339·7	528·7	72·4	423·6	1,024·7	36·4	...	36·4	...	...	36·4	1,061·1	10	105·9(e)
2	348·0	661·8	1,009·8	132·3	820,8	1,962·9	66·3	...	66·3	...	...	66·3	2,029·2	19	106·8
3	331·1	722·8	1,053·9	135·9	894,8	2,084·6	92·9	...	92·9	...	...	92·9	2,177·5	20	108·9
4	250·2	512·3	762·5	92·6	643·5	1,498·6	63·9	...	63·9	...	...	63·9	1,562·5	15	107·8(e)
5	313·9	646·9	960·8	125·3	718·0	1,804·1	97·8	...	97·8	...	...	97·8	1,901·9	19	100·1
6	337·4	652·3	989·7	130·0	805·0	1,924·7	101·1	...	101·1	...	...	101·1	2,025·8	19	106·6

The periods mentioned above refer to four-weekly periods: Period 1, 1965, commenced on 26th December, 1964; Period 6, 1966, ended on 18th June, 1966.

(a) See note (a) Table 1. (b) See Table 31 for variation between districts. (c) 53-week year. (d) 54-week year.

(e) Allowance made for variation in annual holiday periods. *Includes Army production.

TABLE 4 - PRODUCTION OF BLACK COAL ('000 tons) - OPEN CUT AND UNDERGROUND

AUSTRALIA

Year or Period	UNDERGROUND MINES							OPEN CUT MINES							Underground and Open Cut Australia
	Other States					N.S.W.	Australia	Other States					N.S.W.	Australia	
	Victoria	Queensland	Western Australia	Tasmania	Total			Queensland	South Australia	Western Australia	Tasmania	Total			
1941	326·0	1,408·0	557·0	110·0	2,401·0	11,699·1	14,100·1	46·0	...	...	...	46·0	66·6	112·6	14,212·7
1942	311·0	1,661·5	586·9	124·6	2,684·0	12,149·1	14,833·1	60·3	...	...	...	60·3	56·8	117·1	14,950·2
1943	286·1	1,670·8	529·1	143·1	2,629·1	11,413·3	14,042·4	61·5	...	...	...	61·5	60·2	121·7	14,164·1
1944	256·6	1,623 6	498·9	146·0	2,525·1	10,863·2	13,388·3	65·8	34·5	68·9	...	169·2	179·7	348·9	13,737·2
1945	244·9	1,530·5	434·5	146·2	2,356·1	9,653·2	12,009·3	107·0	41·4	112·2	...	260·6	523·1	783·7	12,793·0
1946	191·6	1,450·6	491·0	157·8	2,291·0	10,430·0	12,721·0	118·2	137·3	153·4	...	408·9	756·4	1,165·3	13,886·3
1947	178·7	1,647·5	582·4	160·0	2,568·6	10,724·4	13,293·0	240·1	179·2	148·3	...	567·6	958·7	1,526·3	14,819·3
1948	174·1	1,522·0	594·0	181·3	2,471·4	10,466·8	12,938·2	234·0	249·3	148·6	...	631·9	1,254·6	1,886·5	14,824·7
1949	132·5	1,546·4	545·6	177·6	2,402·1	9,388·6	11,790·7	424·9	337·2	206·2	...	968·3	1,347·5	2,315·8	14,106·5
1950	137·2	1,865·4	558·8	210·4	2,771·8	11,196·6	13,968·4	460·3	259·0	258·0	0·8	978·1	1,601·6	2,579·7	16,548·1
1951	146·4	1 866·1	481·4	228·0	2,721·9	11,224·2	13,946·1	614·6	393·7	367·9	6·6	1,382·8	2,289·0	3,671·8	17,617·9
1952	143·1	2,021·6	419·5	237·9	2,822·1	12,491·9	15,314·0	735·6	415·8	406·9	7·4	1,565·7	2,530·2	4,095·9	19,409·9
1953	152·1	1,958·8	484·3	235·9	2,831·1	12,451·7	15,282·8	574 6	447·7	395·2	0·1	1,417·6	1,722·1	3,139·7	18,422·5
1954	141·1	2,066·2	609·0	256·9	3,073·2	13,703·7	16,776·9	682·4	493·3	412·1	8·7	1,596·5	1,380·0	2,976·5	19,753·4
1955	132·4	2,116·0	577·5	282·3	3,108·2	13,834 8	16,943·0	647·2	458·5	330·4	15·2	1,451·3	901·6	2,352·9	19,295·9
1956	120·1	2,098·0	619·3	282·2	3,119·6	13,999·6	17,119·2	620·9	482·5	219·1	18·0	1,340·5	810·6	2,151·1	19,270·3
1957	115·8	2,169·0	686·6	249·9	3,221·3	14,662·1	17,883·4	493·8	606·1	152·7	15·2	1,267·8	728·1	1,995·9	19,879·3
1958	110·7	2,102·2	780·0	261·1	3,254·0	15,130·6	18,384·6	475·6	746·5	91·8	16·4	1,330·3	720·3	2,050·6	20,435·2
1959	89·4	2,139·7	803·2	283·2	3,315·5	15,278·2	18,593·7	453·3	708·9	110·6	16·9	1,289·7	434·2	1,723·9	20,317·6
1950	84·0	2,287·8	801·9	286·4	3,460·1	16,981·5	20,441·6	373·3	882·5	120·5	14·8	1,391·1	755·4	2,146·5	22,588·1
1961	67·1	2,194·6	506·4	248·4	3,016·5	18,188·6	21,205·1	614·2	1,113·5	259·4	14·4	2,001·5	832·2	2,833·7	24,038·8
1962	53·9	2,195·6	598·5	260·9	3,108·9	18,195·9	21,304·8	617·2	1,394·7	320·6	10·2	2,342·7	834·5	3,177·2	24,482·0
1963	50·8	2,433·2	606·0	198·2	3,288·2	18,337·8	21,626·0	812·2	1,517·7	301·6	0·6	2,632·1	602·4	3,234·5	24,860·5
1964	48·0	2,736·1	639·0	149·9	3,573·0	19,982·7	23,555·7	1,077·4	1,736·1	343·3	...	3,156·8	716·4	3,873·2	27,428·9
1965 (b).....	41 4	2,987·3	503·3	98·5	3,635·5	23,234·6	26,870·1	1,204·0	1,982·6	485·5	...	3,672·1	895·4	4,567·5	31,437·6
1966–1st half	15·8	1,569·0	233·2	41·3	1,859·3	11,330·4	13,189·7	729·9	996·4	267·0	...	1,993·3	517·0	2,510·3	15,700·0
1947–48	182·4	1,549·5	586·9	168·6	2,487·4	10,793·0	13,280·4	208·3	208·0	147·5	...	563·8	1,124·7	1,688·5	14,968·9
1948–49	149·0	1,655·5	577·2	189·1	2,570·8	10,317·9	12,888·7	317·2	291·2	184·7	...	793·1	1,329·5	2,122·6	15,011·3
1949–50	139·9	1,668·7	557·7	185·5	2,551·8	9,891·0	12,442·8	512·4	308·2	226·9	...	1,047·5	1,402·3	2,449·8	14,892·6
1950–51	131·9	1,799·7	529·2	211·1	2,671·9	10,871·8	13,543·7	453·1	316·7	307·5	1·6	1,078·9	1,811·7	2,890·6	16,434·3
1951–52	143·7	1,962·0	459·4	239·2	2,804·3	12,068·2	14,872·5	703·7	424·5	423·3	11·4	1,562·9	2,665·3	4,228·2	19,100·7
1952–53	152·1	1,994·3	412·8	238·9	2,798·1	12,184·1	14,982·2	681·8	414·3	354·1	1·8	1,452·0	2,080·1	3,532·1	18,514 3
1953–54	143·8	1,990·0	535·6	241·8	2,911·2	13,348·3	16,259·5	607·3	470·4	414·8	1·8	1,494·3	1,577·6	3,071·9	19,331·4
1954–55	140·7	2,105·3	599·1	267·0	3,112·1	13,498·1	16,610·2	671·6	494·1	375·7	13·7	1,555·1	1,100·7	2,655·8	19,266·0
1955–56	121·7	2,045·5	593·2	282·2	3,042·6	13,699·1	16,741·7	613·7	449·7	278·5	15·2	1,357·1	854·7	2,211·8	18,953·5
1956–57	118 2	2,157·2	665·2	262·6	3,203·2	14,465·3	17,668·5	591·3	523·8	177·1	19·5	1,311·7	764·5	2,076·2	19,744·7
1957–58	116·9	2,126·4	717·9	254·2	3,215·4	14,867·6	18,083·0	461·8	708.5	133·5	13·1	1,316·9	786·8	2,103·7	20,186·7
1958–59	98·0	2,129·1	800·5	271·3	3,298·9	15,286·7	18,585·6	468·3	723·9	103·8	20·4	1,316·4	475·3	1,791·7	20,377·3
1959–60 (a)...	88·7	2,286·1	819·1	296·4	3,490·3	16,489·6	19,979·9	435·7	765·4	119·8	14·1	1,335·0	586·6	1,921·6	21,901·5
1960–61	78·1	2,240·6	600·8	275·1	3,194·6	17,355·3	20,549·9	357·6	1,002·7	140·1	15·4	1,515·8	807·5	2,323·3	22,873·2
1961–62	58·3	2,162·1	605·8	242·9	3,069·1	18,133·5	21,202·6	741·5	1,227·1	324·4	10·0	2,303·0	949·5	3,252·5	24,455·1
1962–63	53·5	2,292·8	611·5	231·9	3,189·7	18,103·7	21,293·4	595·5	1,472·0	321·0	7·0	2,395·5	621·2	3,016·7	24,310·1
1963–64	48·6	2,592·9	607·4	177·6	3,426·5	19,600·5	23,027·0	1,075·3	1,606·2	309·1	...	2,990·6	637·6	3,628·2	26,655·2
1964–65	45·5	2,814·6	585·4	127·4	3,572·9	20,937·9	24,510·8	1,080·7	1,909·3	373·8	...	3,363·8	875·7	4,239·5	28,750·3
1965–66 (b)...	38·2	3,185·7	497·7	93·5	3,815·1	24,044·5	27,859·6	1,394·0	2,010.9	561·1	...	3,966·0	966.0	4,932·0	32,791·6
1965—															
Period 1 ...	0·9	106·6	13·1	1·2	121·8	884·2	1,006·0	61·8	123·4	8·5	...	193·7	47·1	240·8	1,246·8
2 ...	4·0	220·9	50·0	10·7	285.6	1,739·1	2,024·7	79·2	140·1	29·9	...	249·2	75·1	324·3	2,349·0
3 ...	4·0	235·1	50·2	9·7	299·0	1,836·2	2,135·2	111·3	165·5	27·1	...	303·9	85·8	389·7	2,524·9
4 ...	3·1	221·1	37·4	9·5	271·1	1,760·9	2,032·0	104·1	177·1	30·0	...	311·2	71·1	382·3	2,414·3
5 ...	2·2	205·3	31·0	4·3	242·8	1,435·7	1,678·5	70·5	127·7	28·4	...	226·6	57·3	283·9	1,962·4
6 ...	3·5	261·8	41·1	7·3	313·7	1,941·3	2,255·0	66·2	161·6	45·2	...	273·0	80·4	353·4	2,608·4
7 ...	3·2	252·5	41·9	8·2	305·8	1,935·5	2,241·3	92·9	157·6	44·5	...	295·0	62·8	357·8	2,599·1
8 ...	3·9	259·5	41·4	8·7	313·5	1,999·0	2,312·5	122·4	169·1	46·4	...	337·9	64·7	402·6	2,715·1
9 ...	3·1	192·2	31·8	8·2	235·3	1,764·6	1,999·9	70·4	156·0	35·5	...	261·9	55·8	317·7	2,317·6
10 ...	3·3	278·5	44·0	8·1	333·9	1,903·8	2,237·7	103·3	143·9	46·0	...	293·2	78·6	371·8	2,609·5
11 ...	3·4	284·0	43·8	8·0	339·2	1,974·2	2,313·4	133·9	145·5	45·5	...	324·9	69·0	393·9	2,707·3
12 ...	3·5	271·6	40·5	7·6	323·2	1,958·6	2,281·8	113·7	148·2	47·8	...	309·7	68·2	377·9	2,659·7
13 ...	3·3	198·2	42·1	7·0	250·6	2,100·4	2,351·0	74·3	146·5	50·7	...	271·5	79·5	351·0	2,702·0
1 week	...	...	...	...	...	1·1	1·1	...	20·4	...	...	20·4	...	20·4	21·5
1966—															
Period 1 ..	1·5	185·4	20·2	2·6	209·7	1,024·7	1,234·4	74·3	145·1	22·9	...	242·3	36·4	278·7	1,513·1
2 ..	2·6	255·0	39·0	7·2	303·8	1,962·9	2,266·7	110·6	137·7	48·6	...	296·9	66·3	363·2	2,629·9
3 ..	3·0	270·5	40·1	7·2	320·8	2,084·6	2,405·4	118·2	168·0	45·2	...	331·4	92·9	424·3	2,829·7
4 ..	1·6	230·9	29·4	6·0	267·9	1,498·6	1,766·5	102·5	156·9	31·6	...	291·0	63·9	354·9	2,121·4
5 ..	2·8	227·6	39·9	7·9	278·2	1,804·1	2,082·3	108·2	135·4	46·1	...	289·7	97·8	387·5	2,469·8
6 ..	2·9	256·8	43·6	7·0	310·3	1,924·7	2,235·0	150·1	164·6	48·2	...	362·9	101·1	464·0	2,699·0

The periods referred to above are four-weekly periods: Period 1, 1965, commenced on 26th December, 1964; Period 6, 1966, ended on 18th June, 1966.

(a) 54-week year. (b) 53-week year.

TABLE 5 - PRODUCTION OF BLACK COAL ('000 tons) - NEW SOUTH WALES SEAMS 1964-1965

NAME OF SEAM	1964		1965(a)	
NORTHERN COALFIELD—				
Permian—				
Newcastle Coal Measures (Formerly " Newcastle Stage ")—				
Wallarah	456·4		882·6	
Great Northern	2,838·8		2,871·2	
Fassifern	315·9		204·3	
Wave Hill	..		..	
Victoria Tunnel	633·1		859·1	
Dudley	746·8		844·0	
Young Wallsend	304·8		312·5	
Borehole	775·9		928·8	
		6,071·7		6,902·5
Tomago Coal Measures (Formerly " Tomago Stage " of East Maitland Area)—				
Donaldson's	23·1		21·2	
Big Ben	652·0		753·0	
Rathluba (Upper and Lower)	94·3		172·2	
		769·4		946·4
Singleton Coal Measures (Combined Newcastle and Tomago Coal Measures of Broke/Singleton/Muswellbrook Areas)—				
Liddell	931·0		1,826·5	
		931·0		1,826·5
Greta Coal Measures—Cessnock/Maitland Area—				
Greta	1,966·7		2,129·1	
Homeville	235·8		265·7	
		2,202·5		2,394·8
Greta Coal Measures—Muswellbrook Area—				
Muswellbrook	72·9		77·5	
St. Heliers	176·9		184·8	
Lewis	319·1		260·9	
		568·9		523·2
Greta Coal Measures—Balmoral Area—				
Grasstrees	..		..	
		..		..
Ashford Coal Measures—				
Ashford	31·8		41·3	
		31·8		41·3
NORTH-WESTERN COALFIELD—				
Permian—				
Black Jack Coal Measures—Gunnedah Area—				
Hoskisson	91·9		90·2	
		91·9		90·2
Werris Creek Coal Measures—				
Werris Creek	11·1		5·7	
		11·1		5·7
WESTERN COALFIELD—				
Permian—				
Illawarra Coal Measures (Formerly "Lithgow Coal Measures")				
Katoomba	85·1		125·5	
Lithgow	1,484·8		1,540·0	
Ulan	24·0		21·1	
		1,593·9		1,686·6
SOUTHERN-SOUTH WESTERN COALFIELD—				
Permian—				
Illawarra Coal Measures—				
Bulli	3,601·6		4,097·2	
Nattai	2,068·0		2,901·6	
Wongawilli	2,667·5		2,616·8	
American Creek	34·2		33·3	
Tongarra	23·0		27·5	
Uncorrelated	0·4		..	
		8,394·7		9,676·4
OTHER AREAS—				
Triassic—				
Nymboida Coal Measures—				
Farquhar's Creek	32·2		36·4	
		32·2		36·4
Jurassic—				
Walloon Coal Measures—				
Bonalbo	..		..	
		..		..
NEW SOUTH WALES		20,699·1		24,130·0

The names of many rock units in the coal measures of N.S.W. are at present being standardised by the Standing Committee on Coalfield Geology of N.S.W. The terms " Upper Coal Measures " and " Lower Coal Measures " are now obsolete and have been omitted from this table.

(a) 53-week year.

TABLE 6 PRODUCTION OF BROWN COAL - VICTORIA (1000 tons)

Year	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
State Electricity Commission	6,834	7,240	7,535	7,717	8,393	9,237	9,661	9,831	10,810	12,164	14,388	15,807	16,630	17,936	18,509	20,189
Maddingley Brown Coal Co.	225	284	278	326	505	412	443	460	455	499	432	371	407	416	418	445
Others	268	311	290	214	433	463	456	449	378	372	147	101	101	105	104	77
Total	7,327	7,835	8,103	8,257	9,331	10,112	10,560	10,740	11,643	13,035	14,967	16,279	17,138	18,457	19,031	20,711
Ex-mine Value ($A/ton)				0.879	0.846	0.867	0.880	0.969	0.931	0.939	0.915	0.959	0.915	0.929	0.967	1.001

TABLE 7 - NEW SOUTH WALES UNDERGROUND MINES - COAL MECHANICALLY CUT AND LOADED ('000 tons)

Source : New South Wales Department of Mines

Year	North		West		South		New South Wales	
	Mech. Cut	Mech. Loaded	Mech. Cut	Mech. Loaded	Mech. Cut	Mech. Loaded	Mech. Cut	Mech. Loaded
1949	1,915	1,759	286	345	1,247	985	3,448	3,089
1950	2,461	2,532	364	455	1,650	1,425	4,475	4,412
1951	2,773	2,840	466	583	1,852	1,680	5,091	5,103
1952	3,745	3,840	559	681	2,097	1,988	6,401	6,509
1953	4,063	4,167	564	761	2,299	2,237	6,926	7,165
1954	4,558	4,815	794	1,060	2,621	2,562	7,973	8,437
1955	4,871	5,210	1,005	1,130	2,912	2,885	8,788	9,225
1956	4,901	5,489	1,086	1,212	3,242	3,228	9,229	9,929
1957	5,717	6,156	1,210	1,329	3,818	3,855	10,745	11,340
1958	6,695	6,971	1,391	1,445	3,913	3,938	11,999	12,354
1959	7,690	7,820	1,398	1,412	4,260	4,251	13,348	13,483
1960	8,469	9,014	1,415	1,423	5,218	5,250	15,102	15,687
1961	8,597	9,118	1,467	1,477	6,641	6,729	16,705	17,324
1962	8,484	8,887	1,438	1,498	7,085	7,167	17,007	17,552
1963	8,147	8,618	1,559	1,614	7,491	7,535	17,197	17,767
1964	9,339	9,804	1,533	1,533	8,064	8,107	18,936	19,464
1965	11,128	11,614	1,628	1,630	9,336	9,369	22,092	22,613
Expressed as a percentage of actual production								
1949	30·9	28·4	22·2	26·7	65·3	51·6	36·7	32·9
1950	33·3	34·2	25·9	32·4	68·9	59·5	40·0	39·4
1951	33·4	38·8	33·2	41·5	73·9	67·0	45·4	45·5
1952	45·5	46·7	37·6	45·8	75·5	71·6	51·2	52·1
1953	51·1	52·4	37·9	51·2	76·4	74·3	55·6	57·5
1954	52·8	55·8	46·4	62·0	77·9	76·1	58·2	61·6
1955	57·4	61·4	57·2	64·3	81·0	80·2	63·5	66·7
1956	58·6	65·7	65·5	73·1	81·4	81·1	65·9	70·9
1957	67·4	72·6	74·4	81·8	83·8	84·6	73·3	77·3
1958	75·5	78·6	88·3	91·8	83·4	83·9	79·3	81·6
1959	86·4	87·8	89·5	90·4	88·5	88·3	87·4	88·2
1960	87·6	93·2	89·7	90·2	91·0	91·5	88·9	92·4
1961	90·0	95·5	92·5	93·1	94·1	95·4	91·8	95·2
1962	92·0	96·4	94·7	98·7	95·0	96·1	93·5	96·5
1963	91·7	97·0	95·1	98·5	95·8	96·4	93·8	96·9
1964	93 4	98·1	96·2	97·4	96·1	96·6	94·8	97 4
1965	93·8	97·9	96·6	96·7	96·5	96·8	95·0	97·4

COAL MECHANICALLY CUT AND LOADED ('000 tons) BY CONTINUOUS MINERS

(Included above)

Year	North		West		South		New South Wales	
	Cut	Loaded	Cut	Loaded	Cut	Loaded	Cut	Loaded
1956	232	232	..	..	700	700	932	932
1957	437	354	44	44	1,525	1,014	2,006	1,412
1958	664	408	47	47	1,884	1,157	2,595	1,612
1959	926	642	..	..	2,508	1,453	3,434	2,095
1960	2,238	1,938	84	84	3,927	2,371	6,249	4,393
1961	2,814	2,165	193	193	5,978	3,546	8,985	5,904
1962	3,834	2,944	292	292	6,705	3,313	10,831	6,531
1963	4,229	2,946	318	318	7,077	3,679	11,624	6,943
1964	5,910	4,718	471	471	7,757	4,267	14,138	9,456
1965	8,087	6,003	727	727	8,847	4,600	17,661	11,330
Expressed as a percentage of actual production								
1956	2·8	2·8	..	..	17·6	17·6	6·7	6·7
1957	5·2	4·2	2·7	2·7	33·5	22·2	13·7	9·6
1958	7·5	4·6	3·0	3·0	40·1	24·6	17·1	10·6
1959	10·4	7·2	..	..	52·1	30·2	22·5	13·7
1960	23·1	20·0	5·3	5·3	68·5	41·3	36·8	25·9
1961	29·4	22·7	12·2	12·2	84·7	50·3	49·4	32·4
1962	41·6	30·2	19·2	19·2	90·0	44·4	59·5	36·0
1963	47·6	33·2	19·4	19·4	90·5	47·1	63·4	37·9
1964	59·1	47·2	29·5	29·5	92·4	50·8	70·8	47·3
1965	68·1	50·6	43·1	43·1	91·4	47·5	76·0	48·8

TABLE 8 - NEW SOUTH WALES UNDERGROUND MINES - METHOD OF MINING AND LOADING COAL 1957-1966

	AVERAGE DAILY PRODUCTION—TONS						Percentage of Total Production
	Cessnock and North West		Newcastle	West	South	New South Wales	
	South Maitland	North West					
A. COAL WON BY—							
Continuous miners—(c)							
As at June 1957	..	..	1,669	340	7,536	9,545	14·6
1958	..	..	2,879	350	9,165	12,394	18·8
1959	493	....	3,229	....	11,013	14,735	22·4
1960	4,394	....	5,641	550	17,372	27,957	39·2
1961	7,858	650	6,288	550	25,428	40,774	50·5
1962	9,249	1,620	5,919	1,189	28,596	46,573	58·8
1963	7,914	1,671	9,496	1,460	31,540	52,081	64·3
1964	7,171	1,936	16,618	2,672	33,712	62,109	71·9
1965	9,286	4,713	21,882	2,904	38,187	76,972	77·7
1966	8,685	8,409	25,467	4,167	42,493	87,221	82·7
Coal cutters (a) —							
As at June 1957	6,103	1,949	14,447	5,450	10,141	38,090	58·2
1958	8,095	2,081	15,938	5,622	8,712	40,448	61·5
1959	8,350	2,211	18,114	5,972	8,337	42,984	65·5
1960	7,183	2,368	15,603	5,239	5,181	35,574	49·9
1961	4,142	2,708	16,674	5,810	3,956	33,290	41·2
1962	1,783	2,811	15,839	5,077	2,030	27,540	34·8
1963	578	1,217	14,768	5,243	2,037	23,843	29·4
1964	800	1,465	12,173	4,020	1,204	19,662	22·8
1965	627	1,086	10,747	3,818	1,250	17,528	17·7
1966	1,362	924	8,492	2,574	810	14,162	13·4
Mined by hand, or grunched —							
As at June 1957	9,137	1,477	2,609	1,118	3,442	17,783	27·2
1958	6,030	1,277	1,645	865	3,139	12,956	19·7
1959	2,332	1,227	1,877	536	1,967	7,939	12·1
1960	1,920	1,120	1,501	680	2,537	7,758	10·9
1961	1,463	1,119	1,655	487	1,938	6,662	8·3
1962	1,047	1,029	1,200	404	1,365	5,045	6·4
1963	1,206	1,032	1,190	293	1,380	5,101	6·3
1964	1,271	924	787	183	1,427	4,592	5·3
1965	1,200	933	723	186	1,497	4,539	4·6
1966	1,099	684	656	101	1,550	4,090	3·9
B. COAL LOADED BY —							
Continuous Miners without "pick-up" loader —							
As at June 1957	....	....	1,280	340	4,575	6,195	9·5
1958	....	....	1,200	350	5,065	6,615	10·0
1959	....	....	2,445	....	6,220	8,665	13·2
1960	3,261	....	3,590	....	10,394	17,245	24·2
1961	6,349	....	3,684	550	9,641	20,224	25·0
1962	8,905	....	3,447	1,189	13,323	26,864	33·9
1963 (c)	7,914	....	6,459	1,460	16,220	32,053	39·5
1964	7,171	....	12,014	2,672	18,395	40,252	46·6
1965	8,636	620	15,514	2,904	21,122	48,796	49·3
1966 (c)	7,136	1,064	20,161	4,167	25,329	57,857	54·9
Mobile loader operating as "pick-up" behind a continuous miner —							
As at June 1957	....	....	389	....	2,961	3,350	5·1
1958	....	....	1,679	....	4,100	5,779	8·8
1959	493	....	784	....	4,793	6,070	9·3
1960	1,133	....	2,051	550	6,978	10,712	15·0
1961	1,509	650	2,604	....	15,787	20,550	25·5
1962	344	1,620	2,472	....	15,273	19,709	24·9
1963	....	1,671	3,037	....	15,320	20,028	24·7
1964	....	1,936	4,604	....	15,317	21,857	25·3
1965	650	4,150	6,368	....	17,065	28,233	28·5
1966	1,549	5,345	5,306	....	17,164	29,364	27·8
Mobile loaders (not included above) —							
As at June 1957	6,833	1,936	14,560	5,521	10,391	39,241	60·0
1958	7,995	2,066	15,177	5,682	8,858	39,778	60·5
1959	8,350	2,197	17,989	5,872	8,217	42,625	64·9
1960	8,003	2,368	15,473	5,384	5,375	36,603	51·4
1961	4,755	2,708	16,541	5,876	4,357	34,237	42·4
1962	2,263	2,811	15,690	5,333	2,163	28,260	35·7
1963	1,136	1,217	14,691	5,406	2,146	24,596	30·4
1964	1,288	1,509	12,207	4,075	1,352	20,431	23·7
1965	1,159	1,029	10,677	3,825	1,414	18,104	18·3
1966	1,915	924	8,646	2,654	1,141	15,280	14·5
Scraper loaders (b) —							
As at June 1957	954	149	539	....	....	1,642	2·5
1958	704	256	650	175	....	1,785	2·7
1959	844	227	552	24	....	1,647	2·5
1960	648	328	616	....	....	1,592	2·2
1961	850	394	742	30	....	2,016	2·5
1962	567	326	677	20	....	1,590	2·0
1963	648	332	773	21	....	1,774	2·2
1964	783	284	497	27	....	1,591	1·8
1965	668	387	553	17	....	1,625	1·6
1966	546	373	320	21	....	1,260	1·2
Hand —							
As at June 1957	7,453	1,341	1,957	1,047	3,192	14,990	22·9
1958	5,426	1,036	1,756	630	2,993	11,841	18·0
1959	1,488	1,014	1,450	612	2,087	6,651	10·1
1960	452	792	1,015	535	2,343	5,137	7·2
1961	....	725	1,046	391	1,537	3,699	4·6
1962	....	703	672	128	1,232	2,735	3·5
1963	....	700	494	109	1,271	2,574	3·2
1964	....	596	256	101	1,279	2,232	2·6
1965	....	546	240	162	1,333	2,281	2·3
1966	....	311	182	....	1,219	1,712	1·6
Percentage of coal mechanically loaded—							
As at June 1957	51·1	60·9	89·6	84·8	84·9	77·1	....
1958	61·6	69·1	91·4	90·9	85·8	82·0	....
1959	86·7	70·5	93·8	90·6	90·2	89·9	....
1960	96·7	77·3	95·5	91·7	90·7	92·8	....
1961	100·0	83·8	95·7	94·3	95·1	95·4	....
1962	100·0	87·1	97·1	98·1	96·1	96·4	....
1963	100·0	82·1	98·1	98·4	96·4	96·8	....
1964	100·0	86·2	99·1	98·5	96·5	97·4	....
1965	100·0	91·9	99·3	97·6	96·8	97·7	....
1966	100·0	96·1	99·5	100·0	97·3	98·4	....
Coal loaded into shuttle cars —							
As at June 1957	5,604	1,936	11,623	4,015	9,836	33,014	50·5
1958	7,845	2,066	15,370	4,181	11,029	40,491	61·5
1959	8,843	2,197	17,360	4,348	13,150	45,898	69·9
1960	11,847	2,368	17,569	4,058	18,732	54,574	76·6
1961	12,613	3,358	19,157	4,580	27,421	67,129	83·2
1962	11,512	4,431	18,567	5,108	30,036	69,654	88·0
1963	9,050	2,888	21,002	5,361	32,600	70,901	87·5
1964	8,459	3,375	26,321	5,642	34,816	78,613	91·0
1965	10,445	5,742	30,685	5,279	39,195	91,346	92·2
1966	10,600	7,333	32,317	5,345	42,250	97,845	92·8

(a) Includes a small quantity of coal won by augers
(b) Includes a small quantity by augers and hydraulic methods
(c) Includes mechanized long wall

TABLE 9A - NEW SOUTH WALES UNDERGROUND MINES - PRODUCTIVITY AND STATE OF MECHANIZATION 1950/51 TO 1956/57

A. All machine-loaded *with* modern haulage facilities. B. All machine-loaded *withcut* modern haulage facilities. C. Partly machine-loaded, partly hand-loaded.
D. All hand-loaded employing *more* than twelve men underground. E. All hand-loaded employing *not more* than twelve men underground.

Group.	Mines.				Men Employed. (j).		Production.		Manshifts Possible.		Percentage of Manshifts lost to Manshifts Possible.						Percentage of Manshifts Worked to Manshifts Possible.	Output per Manshift Worked. (Tons).	Average Production per Man for the Period. (Tons). (j).
	1st Half Year.		2nd Half Year.		No.	%	'000 Tons.	%	Thousands.	%	Industrial Disputes.	Breakdowns, Weather, Truck Shortage, etc.	Men on Compensation.	Men on Sick Leave.	Men Absent, Other Causes.	Total Lost.			
	No.	%	No.	%															
Year 1950–51—																			
A	13	10	13	10	1,515	8·8	1,912	17·6	416	9·3	4·37	0·84	2·19	3·08	3·28	13·76	86·24	5·33	1,262
B	10	8	11	8	1,624	9·5	1,068	9·8	426	9·6	4·47	0·23	2·17	3·70	2·52	13·09	86·91	2·88	657
C	26	20	26	19	8,273	48·2	4,346	40·0	2,176	48·7	8·34	0·94	2·30	3·59	2·74	17·91	82·09	2·43	525
D and E	79	62	84	63	5,737	33·5	3,542	32·6	1,448	32·4	7·29	0·95	2·54	3·68	3·14	17·60	82·40	2·97	617
N.S.W.	(a) 128	100	(b) 134	100	17,149	100·0	10,868	100·0	4,466	100·0	7·26	0·87	2·35	3·58	2·90	16·96	83·04	2·93	634
A and B	23	18	24	18	3,139	18·3	2,980	27·4	842	18·9	4·42	0·53	2·18	3·39	2·90	13·42	86·58	4·09	949
Year 1951–52—																			
A	13	10	15	11	1,857	10·4	2,409	20·0	500	10·8	2·68	0·35	1·78	3·19	2·68	10·68	89·32	5·40	1,297
B	10	7	10	7	1,826	10·2	1,393	11·6	489	10·5	4·25	0·21	1·93	3·31	2·14	11·84	88·16	3·23	763
C	26	20	26	18	8,414	46·9	4,559	37·8	2,190	47·1	6·03	0·25	2·13	3·43	2·75	14·59	85·41	2·44	542
D and E	83	63	89	64	5,825	32·5	3,688	30·6	1,469	31·6	5·50	0·25	2·54	3.56	3·07	14·92	85·08	2·95	633
N.S.W.	(c) 132	100	(d) 140	100	17,922	100·0	12,049	100·0	4,648	100·0	5·31	0·25	2·20	3·44	2·78	13·98	86·02	3·01	672
A and B	23	17	25	18	3,683	20·6	3,802	31·6	989	21·3	3·46	0·28	1·85	3·25	2·41	11·25	88·75	4·33	1,032
Year 1952–53—																			
A	19	14	24	18	3,232	17·5	3,496	29·0	845	17·7	4·79	0·18	1·88	3·23	2·24	12·32	87·68	4·72	1,082
B	10	8	11	8	1,888	8·0	1,253	10·4	485	10·2	3·85	0·36	1·98	3·62	1·84	11·65	88·35	2·92	664
C	24	18	22	16	7,460	16·1	3,798	31·5	1,882	39·4	8·82	0·21	2·04	3·38	2·96	17·41	82·59	2·44	509
D	56	43	55	40	5,973	40·2	3,246	26·9	1,493	31·2	6·81	0·37	2·36	3·75	3·38	16·67	83·33	2·61	543
E	23	17	25	18	289	18·2	261	2·2	71	1·5	3·43	1·60	1·61	2·53	1·73	10·90	89·10	4·15	903
N.S.W.	(e) 132	100	(f) 137	100	18,842	100·0	12,054	100·0	4,776	100·0	6·90	0·29	2·10	3·48	2·83	15·60	84·40	2·99	640
A and B	29	22	35	26	5,120	25·5	4,749	39·4	1,330	27·9	4·45	0·25	1·91	3·37	2·09	12·07	87·93	4·06	928
Year 1953–54—																			
A	29	20	29	20	4,190	21·8	4,645	34·9	1,073	22·4	3·21	0·28	2·29	3·25	2·16	11·19	88·81	4·87	1,109
B	12	9	11	8	1,896	9·9	1,408	10·6	483	10·1	2·11	0·15	1·96	3·61	1·66	9·49	90·51	3·22	743
C	22	16	22	16	8,160	42·5	4,216	31·6	2,028	42·4	5·47	0·31	2·39	3·41	2·93	14·51	85·49	2·43	517
D	50	35	52	37	4,626	24·1	2,743	20·6	1,124	23·5	4·41	0·34	2·46	3·74	2·92	13·87	86·13	2·83	593
E	29	20	27	19	328	1·7	303	2·3	79	1·6	1·38	0·27	1·48	2·73	1·99	7·85	92·15	4·17	925
N.S.W.	(g) 142	100	(h) 141	100	19,200	100·0	13,315	100·0	4,787	100·0	4·31	0·30	2·32	3·46	2·61	13·00	87·00	3·20	693
A and B	41	29	40	28	6,086	31·7	6,053	45·5	1,556	32·5	2·87	0·24	2·19	3·36	2·00	10·66	89·34	4·35	995
Year 1954–55—																			
A	30	23	34	26	4,659	24·6	5,410	40·2	1,209	25·3	3·01	0·72	2·55	3·43	2·23	11·94	88·06	5·08	1,161
B	12	9	10	8	1,680	8·9	1,276	9·5	441	9·2	2·38	0·56	2·31	3·67	1·42	10·34	89·66	3·22	759
C	24	18	24	19	8,261	43·7	4,182	31·1	2,079	43·4	6·49	1·08	3·09	3·81	2·80	17·27	82·73	2·43	506
D	43	32	39	31	4,035	21·4	2,364	17·5	993	20·7	4·95	1·30	3·25	4·26	2·94	16·70	83·30	2·86	586
E	24	18	20	16	272	1·4	235	1·7	67	1·4	2·30	1·05	1·77	2·62	1·50	9·24	90·76	3·91	865
N.S.W.	(k) 133	100	(l) 127	100	18,907	100·0	13,467	100·0	4,789	100·0	4·86	0·99	2·89	3·77	2·54	15·05	84·95	3·31	712
A and B	42	32	44	34	6,339	33·5	6,686	49·7	1,650	34·5	2·85	0·68	2·48	3·49	2·01	11·51	88·49	4·58	1,055
Year 1955–56—																			
A	36	28	36	30	5,360	30·0	6,249	45·7	1,406	30·6	4·27	0·49	2·55	3·63	1·96	12·90	87·10	5·10	1,166
B	10	7	11	9	1,573	8·8	1,239	9·1	402	8·8	2·27	0·51	2·30	3·72	1·63	10·43	89·57	3·44	788
C	23	18	18	15	6,850	38·4	3,673	26·9	1,777	38·7	6·29	0·50	3·04	3·69	2·76	16·28	83·72	2·47	536
D	38	29	33	28	3,803	21·3	2,270	16·6	941	20·5	4·68	0·81	3·33	4·15	2·58	15·55	84·45	2·86	597
E	23	18	22	18	262	1·5	233	1·7	65	1·4	2·73	0·34	2·13	2·24	1·71	9·15	90·85	3·91	888
N.S.W.	(m) 130	100	(n) 120	100	17,848	100·0	13,664	100·0	4,591	100·0	4·94	0·56	2·87	3·75	2·36	14·48	85·52	3·48	766
A and B	46	35	47	39	6,933	38·8	7,488	54·8	1,808	39·4	3·83	0·49	2·49	3·65	1·89	12·35	87·65	4·73	1,080
Year 1956–57—																			
A	41	33	44	38	6,420	37·6	7,933	54·9	1,712	38·7	3·61	0·32	2·37	3·34	1·64	11·28	88·72	5·22	1,236
B	11	9	11	9	1,826	10·7	1,350	9·4	475	10·7	1·86	0·31	2·37	3·65	2·01	10·20	89·80	3·16	739
C	15	12	13	11	4,778	27·9	2,749	19·0	1,221	27·6	3·79	0·54	2·55	3·83	2·32	13·03	86·97	2·59	575
D	34	27	27	24	3,850	22·5	2,181	15·1	958	21·7	5·95	0·60	2·80	3·94	2·27	15·56	84·44	2·70	567
E	23	19	21	18	227	1·3	234	1·6	56	1·3	1·37	0·40	3·31	2·26	1·05	8·39	91·61	4·58	1,031
N.S.W.	(o) 124	100	(p) 116	100	17,101	100·0	14,447	100·0	4,422	100·0	3·95	0·44	2·53	3·62	2·00	12·54	87·46	3·74	845
A and B	52	42	55	47	8,246	48·3	9,283	64·3	2,187	49·4	3·23	0·32	2·37	3·41	1·72	11·05	88·95	4·77	1,126

Mines which were inoperative for various reasons during most of the period are excluded :-
(a) five mines; (b) three mines; (c) six mines; (d) five mines; (e) thirteen mines;
(f) five mines; (g) two mines; (h) two mines; (k) nine mines; (l) nine mines;
(m) one mine; (n) seven mines; (o) one mine; (p) five mines; (j) the average number employed, including men on Long Service Leave.

TABLE 9B - NEW SOUTH WALES UNDERGROUND MINES - PRODUCTIVITY AND STATE OF MECHANIZATION 1957/58 TO 1965/66

A. All machine-loaded *with* modern haulage facilities. B. All machine-loaded *without* modern haulage facilities. C. Partly machine-loaded, partly hand-loaded.
D. All hand-loaded, employing *more* than twelve men underground. E. All hand-loaded, employing *not more* than twelve men underground.

Group	Mines (a)				Men Employed (b)		Production		Manshifts Possible		Percentage of Manshifts Lost to Manshifts Possible						Percentage of Manshifts Worked to Manshifts Possible	Output per Manshift Worked (Tons)	Average Production Per Man for the Period (Tons) (b)
	1st Half Year		2nd Half Year		No.	%	'000 Tons	%	Thousands	%	Industrial Disputes	Breakdowns, Weather, Truck Shortage, etc.	Men on Compensation	Men on Sick Leave	Men Absent, Other Causes	Total Lost			
	No.	%	No.	%															
Year 1957–58—																			
A	46	40	48	44	6,827	43·4	9,168	61·6	1,829	44·8	4·08	0·21	2·44	3·57	1·38	11·68	88·32	5·68	1,343
B	11	10	10	9	1,240	7·9	991	6·7	322	7·9	3·19	0·02	2·89	4·32	1·80	12·22	87·78	3·51	799
C	13	12	15	14	4,693	29·8	2,881	19·4	1,187	29·0	4·23	0·15	2·63	4·10	1·97	13·08	86·92	2·79	614
D	23	20	19	17	2,774	17·6	1,620	10·9	701	17·1	4·41	0·08	3·30	4·07	2·06	13·92	86·08	2·68	584
E	21	18	18	16	198	1·3	208	1·4	48	1·2	1·17	0·25	3·06	1·77	0·94	7·19	92·81	4·64	1,050
N.S.W.	114	100	110	100	(c)15,732	100·0	14,868	100·0	4,087	100·0	4·07	0·15	2·69	3·85	1·70	12·46	87·54	4·16	945
A and B	57	50	58	53	8,067	51·3	10,159	68·3	2,151	52·7	3·95	0·18	2·51	3·68	1·44	11·76	88·24	5·35	1,259
Year 1958–59—																			
A	49	47	48	47	7,148	51·2	10,384	67·9	1,875	51·7	1·75	0·13	2·34	3·82	1·40	9·44	90·56	6·11	1,453
B	14	13	19	18	1,699	12·2	1,372	9·0	433	11·9	1·27	0·05	2·72	4·49	1·42	9·95	90·05	3·52	808
C	13	13	5	5	3,125	22·4	2,219	14·5	805	22·2	2·52	0·26	2·63	4·15	1·59	11·15	88·85	3·10	710
D	14	13	15	15	1,838	13·1	1,138	7·5	475	13·1	4·28	0·20	3·25	4·83	2·06	14·62	85·38	2·81	619
E	15	14	15	15	154	1·1	174	1·1	38	1·1	0·47	0·42	2·31	1·78	0·93	5·91	94·09	4·84	1,130
N.S.W.	105	100	102	100	(d)13,964	100·0	15,287	100·0	3,626	100·0	2·18	0·17	2·57	4·08	1·52	10·52	89·48	4·71	1,095
A and B	63	60	67	65	8,847	63·4	11,756	76·9	2,308	63·6	1·66	0·12	2·41	3·94	1·40	9·53	90·47	5·63	1,329
Year 1959–60—(g)																			
A	50	49	49	50	8,012	61·2	12,061	73·2	2,179	61·7	2·23	0·34	2·28	3·51	1·60	9·96	90·04	6·15	1,505
B	19	18	20	21	2,187	16·7	1,882	11·4	598	16·9	2·21	0·01	2·46	4·16	1·01	9·85	90·15	3·49	861
C	5	5	6	6	1,803	13·8	1,580	9·6	473	13·4	0·62	0·36	1·76	3·75	1·54	8·03	91·97	3·64	876
D	13	13	10	10	960	7·3	817	4·9	249	7·0	2·89	0·36	3·17	4·05	2·13	12·60	87·40	3·75	851
E	15	15	13	13	133	1·0	144	0·9	34	1·0	0·45	0·10	1·18	2·30	0·97	5·00	95·00	4·45	1,082
N.S.W.	102	100	98	100	(e)13,095	100·0	16,484	100·0	3,533	100·0	2·04	0·29	2·29	3·68	1·52	9·82	90·18	5·17	1,259(g)
A and B	69	67	69	71	10,199	77·9	13,943	84·6	2,777	78·6	2·22	0·27	2·32	3·65	1·48	9·94	90·06	5·57	1,367
Year 1960–61—																			
A	51	55	49	55	8,359	66·1	13,509	78·0	2,181	66·7	2·08	0·23	1·89	3·51	1·44	9·15	90·85	6·82	1,616
B	16	17	17	19	1,779	14·1	1,776	10·2	472	14·4	1·53	0·09	2·23	3·92	1·00	8·77	91·23	4·12	998
C	6	6	5	6	1,733	13·7	1,423	8·2	432	13·2	0·94	1·01	1·75	3·46	1·55	8·71	91·29	3·61	821
D	9	10	7	8	655	5·2	526	3·0	158	4·8	3·90	..	3·62	3·75	2·48	13·75	86·25	3·85	803
E	11	12	11	12	111	0·9	109	0·6	28	0·9	0·78	..	0·95	2·08	0·71	4·52	95·48	4·12	977
N.S.W.	93	100	89	100	(f)12,637	100·0	17,343	100·0	3,271	100·0	1·93	0·30	1·99	3·56	1·44	9·22	90·78	5·84	1,372
A and B	67	72	66	74	10,138	80·2	15,285	88·2	2,653	81·1	1·98	0·21	1·95	3·58	1·36	9·08	90·92	6·34	1,507
Year 1961–62—																			
A	49	57	52	60	8,561	72·8	14,955	82·6	2,205	73·1	1·35	0·17	1·85	3·54	1·34	8·25	91·75	7·39	1,747
B	15	17	13	15	1,097	9·3	1,145	6·3	293	9·7	2·10	0·04	2·48	3·69	1·07	9·38	90·62	4·31	1,044
C	4	5	6	7	1,507	12·8	1,514	8·4	374	12·4	0·15	0·08	1·44	3·14	1·46	6·27	93·73	4·32	1,004
D	7	8	4	5	488	4·2	388	2·1	117	3·9	3·07	0·17	3·11	3·65	3·24	13·24	86·76	3·84	795
E	11	13	11	13	114	0·9	101	0·6	27	0·9	1·35	0·28	1·38	2·48	0·84	6·33	93·67	3·92	894
New South Wales	86	100	86	100	(h)11,767	100·0	18,103	100·0	3,016	100·0	1·34	0·15	1·91	3·50	1·39	8·29	91·71	6·54	1,538
A and B	64	74	65	75	9,658	82·1	16,100	88·9	2,498	82·8	1·44	0·16	1·93	3·55	1·30	8·38	91·62	7·03	1,666
Year 1962–63—																			
A	53	62	55	63	8,513	74·4	15,113	83·7	2,176	74·9	1·37	0·18	1·78	3·85	1·36	8·54	91·46	7·60	1,775
B	13	15	15	17	951	8·3	1,045	5·8	246	8·5	1·59	..	2·22	3·79	1·01	8·61	91·39	4·65—	1,099
C	6	7	5	6	1,434	12·5	1,456	8·1	351	12·1	0·14	0·41	1·20	3·27	1·00	6·02	93·98	4·41	1,015
D	4	5	4	5	447	3·9	351	1·9	106	3·6	3·33	..	2·80	4·28	3·41	13·82	86·18	3·85	785
E	10	11	8	9	100	0·9	96	0·5	25	0·9	0·39	0·03	1·99	2·28	0·78	5·47	94·53	4·02	960
New South Wales	86	100	87	100	(i)11,445	100·0	18,061	100·0	2,904	100·0	1·30	0·18	1·79	3·78	1·36	8·41	91·59	6·79	1,578
A and B	66	77	70	80	9,464	82·7	16,158	89·5	2,422	83·4	1·39	0·16	1·83	3·84	1·33	8·55	91·45	7·30	1,707
Year 1963–64—																			
A	59	68	60	70	9,330	83·1	17,518	89·4	2,358	83·2	1·23	0·16	1·60	3·61	1·21	7·81	92·19	8·06	1,878
B	12	14	10	12	839	7·5	995	5·1	221	7·8	0·64	..	1·63	3·59	0·88	6·74	93·26	4·82	1,186
C	5	6	4	5	582	5·2	673	3·4	144	5·1	0·17	0·08	1·76	2·99	0·67	5·67	94·33	4·97	1,157
D	3	3	3	3	387	3·4	307	1·6	91	3·2	2·27	..	2·99	3·70	3·07	12·03	87·97	3·84	794
E	8	9	9	10	86	0·8	91	0·5	21	0·7	0·21	0·09	4·22	2·11	0·22	6·85	93·15	4·59	1,061
New South Wales	87	100	86	100	(j)11,224	100·0	19,584	100·0	2,835	100·0	1·16	0·14	1·67	3·57	1·21	7·75	92·25	7·49	1,745
A and B	71	82	70	82	10,169	90·6	18,513	94·5	2,579	91·0	1·18	0·15	1·60	3·61	1·18	7·72	92·28	7·78	1,820
Year 1964–65—																			
A	57	70	56	70	9,610	86·1	19,336	92·4	2,444	86·3	0·92	0·13	1·39	3·67	1·21	7·32	92·68	8·54	2,012
B	10	12	10	12	803	7·2	942	4·5	210	7·4	1·11	..	1·90	3·88	0·84	7·73	92·27	4·87	1,173
C	4	5	4	5	272	2·4	231	1·1	67	2·3	0·10	..	3·71	3·33	0·72	7·86	92·14	3·76	848
D	3	3	3	4	384	3·5	321	1·5	90	3·2	1·78	..	2·40	4·19	2·96	11·33	88·67	4·03	837
E	8	10	7	9	88	0·8	96	0·5	22	0·8	0·05	..	3·99	2·42	0·95	7·41	92·59	4·59	1,094
New South Wales	82	100	80	100	(k) 11,157	100·0	20,926	100·0	2,833	100·0	0·93	0·11	1·54	3·69	1·22	7·49	92·51	7·99	1,876
A and B	67	82	66	82	10,413	93·3	20,278	96·9	2,654	93·7	0·93	0·12	1·44	3·69	1·18	7·36	92·64	8·25	1.947
Year 1965–66— (q)																			
A	56	70	58	74	10,054	87·0	22,390	93·3	2,632	87·0	2·07	0·21	1·35	3·50	1·26	8·39	91·61	9·33	2,227
B	9	11	10	13	803	6·9	984	4·1	218	7·2	2·26	0·03	1·66	3·74	0·84	8·53	91·47	4·94	1,225
C	4	5	2	3	245	2·1	231	1·0	63	2·1	0·15	0·09	2·74	2·89	0·72	6·59	93·41	3·94	944
D	3	4	3	4	380	3·3	300	1·2	91	3·0	3·05	..	4·05	4·20	3·64	14·94	85·06	3·88	791
E	8	10	5	6	76	0·7	90	0·4	20	0·7	0·77	0·10	4·06	3·08	0·62	8·63	91·37	4·81	1,179
New South Wales	80	100	78	100	(l) 11,558	100·0	23,995	100·0	3,024	100·0	2·06	0·19	1·50	3·52	1·29	8·56	91·44	8·68	2,076
A and B	65	81	68	87	10,857	93·9	23,374	97·4	2,850	94·2	2·08	0·19	1·38	3·52	1·23	8·40	91·60	8·96	2,153

(a) The number of mines is that in operation at the end of the period. (b) The average number employed, including men on Long Service Leave (which commenced in January 1953). Men excluded if developing new mines, re-organizing existing mines or cleaning up at mines which have closed :- (c) 127; (d) 171; (e) 101; (f) 179; (h) 214; (i) 158; (j) 99; (k) 125; (p) 140; (g) 54 week year; (q) 53 week year.

TABLE 10 - NEW SOUTH WALES UNDERGROUND MINES - DAILY TONNAGE OF RAW COAL HAULED BY METHOD AND DISTRICT. JUNE 1966.

	South Maitland	North West	Newcastle	West	Burra-gorang Valley	South Coast	Total
Machine loaded to shuttle cars, then coal transported by—							
Conveyor belts	8,664	7,189	23,523	3,879	13,699	17,572	74,526
Conveyors and locos	..	..	7,568	..	1,529	6,214	15,311
Conveyors and rope	..	144	..	..	..	1,347	1,491
Conveyors, locos and rope	1,090	..	605	..	..	921	2,616
Locomotives	..	..	..	1,466	..	968	2,434
Rope (and horse)	553	..	..	..	..	..	553
Shuttle car to surface	293	..	621	..	..	..	914
Total via shuttle cars	10,600	7,333	32,317	5,345	15,228	27,022	97,845
Machine loaded (other than to shuttle car) then coal transported by—							
Conveyors	..	..	384	..	..	104	488
Conveyors and loco (and rope)	..	..	626	1,396	..	1,280	3,302
Locomotives	..	..	710	..	..	..	710
Rope and/or horse	546	373	396	101	..	..	1,416
Total	546	373	2,116	1,497	..	1,384	5,916
Hand loaded and coal transported by—							
Locomotives, rope and horse	..	26	..	..	..	684	710
Rope and/or horse	..	285	182	..	..	535	1,002
Total Hand Loaded	..	311	182	..	..	1,219	1,712
Total Daily Tonnage	11,146	8,017	34,615	6,842	15,228	29,625	105,473

TABLE 11 - OUTPUT PER MANSHIFT WORKED
OPEN CUT AND UNDERGROUND MINES BY STATES (Tons) (a)

	Period	N.S.W.	Victoria	Q'l'd	South Australia	Western Australia	Tasmania	Australia
(1) Underground Mines—Production per manshift worked at the coal face.	Year—1961.....	24·61	2·15	8·69	..	8·09	8·77	19·04
	1962.....	25·92	1·94	9·25	..	8·90	11·04	20·13
	1963.....	27·26	2·12	10·74	..	9·25	13·76	21·56
	1964.....	30·18	2·37	12·89	..	9·34	13·57	24·18
	1965 (*d*) ..	33·12	2·43	14·82	..	9·17	15·48	27·37
	Year—1951–52 ..	(*b*)10·79	2·41	6·45	..	7·74	6·00	9·41
	1952–53 ..	9·62	2·17	6·35	..	5·51	6·28	8·49
	1953–54 ..	9·96	2·00	6·38	..	4·85	6·02	8·67
	1954–55 ..	10·40	2·16	6·60	..	4·72	6·12	8·97
	1955–56 ..	11·04	2·11	6·68	..	4·80	6·72	9·45
	1956–57 ..	12·02	2·00	6·93	..	5·51	7·34	10·21
	1957–58 ..	13·68	2·03	7·25	..	6·21	7·84	11·41
	1958–59 ..	16·12	2·07	7·38	..	7·19	7·89	13·00
	1959–60 ..	19·27	2·11	7·82	..	7·75	7·12	14·94
	1960–61 ..	22·64	2·23	8·69	..	8·05	8·24	17·61
	1961–62 ..	25·29	1·98	8·83	..	8·57	9·54	19·50
	1962–63 ..	26·35	2·03	9·88	..	9·18	12·47	20·66
	1963–64 ..	28·90	2·19	11·69	..	9·26	14·17	23·02
	1964–65 ..	31·43	2·51	13·79	..	9·25	13·96	25·51
	1965–66 (*d*)	33·52	2·33	15·53	..	9·26	15·54	27·90
(2) Underground Mines—Production per manshift worked overall.	Year—1961.....	6·23	0·83	3·46	..	4·00	4·09	5·55
	1962.....	6·57	0·78	3·57	..	4·32	4·71	5·84
	1963.....	7·04	0·82	4·02	..	4·37	4·90	6·26
	1964.....	7·60	0·90	4·62	..	4·40	5·55	6·83
	1965 (*d*) ..	8·42	0·92	5·37	..	4·17	6·29	7·68
	Year—1951–52 ..	3·01	0·91	2·59	..	1·71	3·02	2·82
	1952–53 ..	2·99	0·81	2·54	..	1·61	3·08	2·78
	1953–54 ..	3·19	0·80	2·53	..	1·76	3·01	2·94
	1954–55 ..	3·30	0·87	2·66	..	1·98	3·18	3·06
	1955–56 ..	3·45	0·84	2·64	..	2·18	3·33	3·19
	1956–57 ..	3·71	0·83	2·73	..	2·55	3·53	3·42
	1957–58 ..	4·12	0·87	2·87	..	2·90	3·90	3·77
	1958–59 ..	4·65	0·91	2·93	..	3·17	3·86	4·18
	1959–60 ..	5·13	0·93	3·03	..	3·45	3·71	4·56
	1960–61 ..	5·76	0·92	3·35	..	3·72	4·02	5·14
	1961–62 ..	6·43	0·78	3·50	..	4·25	4·39	5·72
	1962–63 ..	6·71	0·82	3·76	..	4·37	4·64	5·97
	1963–64 ..	7·43	0·84	4·27	..	4·35	5·30	6·62
	1964–65 ..	7·89	0·93	4·96	..	4·24	6·01	7·15
	1965–66 (*d*)	8·58	0·91	5·64	..	4·31	6·11	7·87
(3) Open Cut Mines—Production per manshift worked overall.	Year—1961.....	22·29	..	11·43	14·91	9·63	10·79	14·60
	1962.....	22·42	..	10·42	19·78	10·32	10·89	15·97
	1963.....	18·86	..	15·43	21·91	12·52	6·81	18·17
	1964.....	21·48	..	16·34	23·86	12·54	..	19·42
	1965 (*d*) ..	20·54	..	17·32	27·06	11·18	..	19·88
	Year—1951–52 ..	8·31	..	12·43	3·03	6·36	4·91	7·21
	1952–53 ..	7·51	..	11·28	3·44	5·48	4·49	6·76
	1953–54 ..	9·13	..	11·81	3·54	5·20	7·91	7·03
	1954–55 ..	8·90	..	11·54	(*c*)6·34	4·80	8·17	7·82
	1955–56 ..	9·98	..	12·00	5·81	6·47	7·28	8·53
	1956–57 ..	10·69	..	13·00	8·44	6·17	9·26	9·89
	1957–58 ..	11·31	..	12·54	11·12	6·52	7·54	10·94
	1958–59 ..	9·74	..	13·42	10·88	7·87	12·61	10·86
	1959–60 ..	19·12	..	11·75	10·93	7·32	8·70	12·34
	1960–61 ..	22·50	..	9·66	13·75	7·96	8·95	14·07
	1961–62 ..	23·90	..	11·54	16·80	10·49	12·82	15·58
	1962–63 ..	18·47	..	11·74	21·25	11·64	10·49	16·59
	1963–64 ..	20·10	..	17·31	22·71	12·46	..	19·16
	1964–65 ..	23·11	..	15·73	26·09	11·87	..	20·07
	1965–66 (*d*)	19·49	..	18·61	26·92	11·03	..	19·73

(*a*) Excludes new projects, *i.e.*, new mines being developed, but at which production of coal has not yet commenced.

(*b*) In April 1952 the definition of persons working "at the coal face" was clarified and, as a result, the number of persons included in this classification increased considerably for New South Wales mines.

(*c*) Figures prior to July 1954 include manshifts on other than mine work.

(*d*) 53-week year.

TABLE 12 - QUEENSLAND COAL MINES -
CLASSIFICATION ACCORDING TO DAILY OUTPUT

Average Daily Output First Six Months of 1952.	Number of Mines Producting as at 30th. June, 1952.								
	West Moreton	Darling Downs	Maryborough	Rockhampton	Bowen	Chillagoe	Callide	Clermont	Total
Tons									
1 - 50	17			1					18
51 - 100	22	3	2	1		2			30
101 - 150	17	2	3	3					25
151 - 200	2	1	1						4
201 - 250	1								1
251 - 300			1						1
301 - 400	1				1				2
401 - 500	1						1		2
501 - 600					1				1
601 - 700								1	1
701 - 800									-
801 - 900							1	1	2
901 - 1000									-
TOTAL	61	6	7	5	2	2	2	2	87

TABLE 13 - QUEENSLAND COAL INDUSTRY STATISTICS
1953-1965

Calendar Year	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
(a) Production—													
(i) By Districts—													
West Moreton	1,284,808	1,402,325	1,460,293	1,420,395	1,536,526	1,498,338	1,525,001	1,635,490	1,704,054	1,656,007	1,801,603	1,840,488	1,992,353
Darling Downs	142,332	143,121	154,699	150,487	116,708	107,739	101,404	104,749	83,949	86,031	80,227	77,961	70,990
Maryborough	177,518	177,065	167,364	159,791	138,569	128,174	141,807	138,956	147,294	155,794	162,554	171,375	174,696
Callide	220,246	303,877	213,486	182,792	157,547	131,927	65,978	74,402	73,911	87,969	107,403	121,123	131,452
Kianga/Moura	..	..	..	..	..	..	17,042	40,184	222,601	201,068	496,297	1,053,805	1,408,499
Rockhampton	110,356	111,761	126,055	122,700	116,923	102,545	95,290	97,406	103,536	118,178	95,680	85,868	63,940
Blair Athol	349,139	310,798	293,465	229,571	206,679	181,518	167,336	160,664	147,362	134,044	143,429	134,349	92,341
Bowen	222,035	270,896	318,248	398,392	373,077	427,576	477,693	411,016	326,559	373,623	358,233	328,566	257,015
Mount Mulligan	27,000	28,773	29,507	24,772	16,766	..	..	..	..	..	..	..	..
TOTAL	2,533,434	2,748,616	2,763,117	2,718,900	2,662,795	2,577,817	2,591,551	2,662,867	2,808,796	2,812,714	3,245,426	3,813,535	4,191,286
(ii) Per Employee	683	729	738	747	749	776	799	820	910	966	1,180	1,439	1,694
(iii) Average daily	11,177	12,251	11,854	12,010	11,434	11,185	11,449	11,873	13,308	13,314	14,822	16,437	18,065
(iv) Per Manshift worked—													
West Moreton—Face	6.40	6.54	6.74	6.86	7.28	7.39	7.72	8.51	9.22	9.97	11.13	12.71	15.10
Overall	2.83	2.93	2.97	2.95	3.11	3.15	3.29	3.58	3.80	3.94	4.28	4.62	5.30
Darling Downs—Face	5.63	5.54	5.61	5.60	6.06	6.10	6.18	6.59	7.08	7.39	7.21	8.26	8.04
Overall	2.88	2.86	2.90	2.79	2.82	2.86	2.96	3.11	3.24	3.45	3.46	3.74	3.30
Maryborough—Face	4.86	5.05	5.03	5.08	4.60	4.74	4.84	4.91	5.25	5.12	5.25	5.78	6.19
Overall	2.34	2.43	2.40	2.29	2.30	2.49	2.47	2.51	2.58	2.50	2.60	2.76	3.02
Rockhampton—Face	7.19	7.00	7.40	7.73	7.71	7.73	7.37	7.69	7.67	7.86	8.86	15.69	17.16
Overall	2.12	2.04	2.28	2.18	2.37	2.64	2.24	2.30	2.53	2.72	2.77	6.20	8.71
Central District Opencuts	10.89	11.74	10.73	13.31	12.15	12.46	10.21	9.51	9.16	8.19	15.34	17.04	18.24
Bowen (U/ground)—Face	8.92	10.43	8.61	9.25	9.63	9.47	9.91	12.72	10.99	12.59	26.89	50.29	34.84
Overall	1.91	1.89	1.76	2.05	2.23	2.19	2.21	2.38	2.50	2.83	4.71	5.72	5.82
Bowen (Opencut)	..	20.74	14.91	12.49	12.22	16.65	17.35	18.97	32.17	25.70	16.34	7.34	..
Mt. Mulligan—Face	4.77	5.25	6.29	6.08	5.22	..	..	..	..	..	..	..	..
Overall	.94	1.08	1.24	1.14	1.07	..	..	..	..	..	..	..	..
Whole State—Face	6.37	6.54	6.61	6.79	7.13	7.28	7.54	8.37	8.69	9.25	10.74	12.89	14.57
Overall	3.07	3.25	3.25	3.24	3.29	3.39	3.41	3.53	4.08	4.17	4.93	5.82	6.70
(b) Number of mines operating at end of year—													
Underground	89	81	81	75	72	69	67	65	65	68	65	60	55
Opencuts	4	4	4	4	4	4	5	5	6	5	5	4	3

TABLE 13 (Cont'd)

Calendar Year	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons				
(c) Number of persons employed at end of year—													
Underground mines	3,530	3,519	3,450	3,481	3,288	3,142	3,116	3,074	2,771	2,651	2,476	2,351	2,238
Opencuts	222	228	211	189	154	143	162	130	259	187	214	243	235
(d) Manshifts worked expressed as percentage of possible manshifts—													
West Moreton	86.29	87.99	89.05	86.77	90.25	89.06	90.25	89.07	89.24	89.80	91.45	92.62	93.63
Darling Downs	86.92	85.32	86.99	86.45	83.09	90.44	88.97	91.56	89.77	91.15	92.75	91.86	92.54
Maryborough	86.35	86.84	85.94	89.40	83.15	82.34	89.04	88.62	88.07	90.97	91.50	92.74	90.96
Rockhampton	81.74	88.51	90.31	90.05	90.36	91.98	91.19	90.03	89.94	91.83	89.70	92.10	92.51
Central District Opencuts ..	93.00	90.02	92.14	92.75	93.94	94.73	95.09	93.45	94.56	95.49	90.99	96.45	95.25
Bowen (underground) ..	86.03	85.26	86.94	88.96	89.98	90.69	90.93	90.67	80.54	92.86	93.00	94.89	88.60
Bowen (opencut)	100.00	96.37	92.10	94.14	91.25	96.29	95.49	95.60	92.59	98.14	96.55	97.58	95.55
Mt. Mulligan	90.63	88.47	89.20	88.26	85.01	..	..	..	..	..	..	..	..
(e) Consumption—										Tons	Tons	Tons	Tons
(i) By Districts—													
North Queensland	413,340	435,931	440,154	478,608	458,021	437,418	432,304	389,061	324,251	355,737	366,148	314,913	252,944
Central Queensland	358,022	381,673	362,888	358,097	337,276	338,405	329,848	334,493	329,026	341,492	333,468	331,088	275,356
Southern Queensland ..	344,127	355,196	365,486	356,180	330,396	328,508	335,601	352,991	320,096	348,880	359,720	377,796	376,094
Metropolitan Area	1,324,617	1,355,782	1,373,774	1,408,390	1,439,801	1,431,521	1,464,540	1,549,158	1,542,634	1,568,389	1,635,139	1,733,176	1,890,230
WHOLE STATE	2,440,106	2,528,582	2,542,302	2,601,275	2,565,494	2,535,852	2,562,293	2,625,703	2,516,007	2,614,498	2,694,475	2,756,973	2,794,624
(ii) By consumer groups—													
Queensland Railways ..	683,575	707,253	673,457	670,150	588,541	522,577	508,289	486,074	410,859	405,352	387,838	362,959	286,451
Electricity	941,680	980,890	1,014,002	1,074,818	1,138,574	1,141,324	1,176,319	1,269,665	1,348,297	1,402,216	1,448,071	1,553,897	1,727,829
Gas	202,879	194,647	200,605	199,830	201,852	194,582	186,099	197,653	197,620	187,653	192,531	185,228	166,926
Meat and Sugar	172,163	171,622	164,872	148,682	135,864	125,982	117,029	100,026	98,489	98,114	100,964	99,922	85,164
Metalliferous Mining ..	111,696	135,809	144,123	136,894	130,598	146,779	171,265	177,868	129,851	163,556	183,651	168,351	148,174
Cement	67,095	78,457	86,422	99,700	102,544	123,128	129,467	121,474	117,403	123,210	135,227	154,892	167,102
Others	261,018	259,904	258,821	271,201	267,521	281,480	273,824	272,943	213,488	234,397	246,193	231,724	212,978
WHOLE STATE	2,440,106	2,528,582	2,542,302	2,601,275	2,565,494	2,535,852	2,562,293	2,625,703	2,516,007	2,614,498	2,694,475	2,756,973	2,794,624

TABLE 14 - QUEENSLAND COAL MINES -
OUTPUT PER MANSHIFT BY DISTRICTS

DISTRICT	YEAR 1959-1960		YEAR 1960-1961		YEAR 1961-1962		YEAR 1962-1963		YEAR 1963-1964		YEAR 1964-1965		YEAR 1965-1966		YEAR 1966-1967	
	July-Dec.	Jan.-June	July-Dec.	Jan.-June	July-Dec.	Jan.-June	July-Dec.	Jan.-June	July-Dec.	Jan.-June	July-Dec.	Jan.-June	July-Dec.	Jan.-June	July-Dec.	Jan.-June
(a) Underground	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
West Moreton —																
Face	7.82	8.11	8.93	9.16	9.28	9.86	10.07	10.87	11.37	12.06	13.37	14.75	15.42	15.82	16.47	16.05
Overall	3.35	3.42	3.74	3.79	3.81	3.91	3.96	4.24	4.31	4.44	4.80	5.15	5.44	5.74	6.07	5.94
Darling Downs—																
Face	6.16	6.52	6.66	7.00	7.15	7.10	7.68	7.05	7.37	8.10	8.41	7.57	8.44	7.36	7.45	8.10
Overall	2.98	3.08	3.14	3.12	3.36	3.34	3.55	3.39	3.52	3.61	3.86	3.04	3.53	3.10	3.31	3.39
Maryborough—																
Face	4.89	4.85	4.98	5.17	5.32	4.96	5.26	5.19	5.30	5.64	5.92	6.02	6 37	6.26	6.72	7.02
Overall	2.47	2.49	2.52	2.54	2.62	2.44	2.56	2.56	2.62	2.68	2.85	2.93	3.11	3.04	3.23	3.36
Rockhampton—																
Face	7.40	7.68	7.69	7.49	7.84	7.60	8.09	7.99	9.51	14.40	15.69	19.48	15.49	13.66	14.59	16.68
Overall	2.17	2.19	2.40	2.42	2.63	2.61	2.82	2.31	3.16	5.51	6.20	8.46	8.96	8.69	9.31	9.45
Bowen—																
Face	10.05	11.80	13.86	11.79	10.34	9.28	16.21	20.15	35.01	47.16	53.75	25.53	41.22	39.36	48.91	54.06
Overall	2.21	2.37	2.40	2.28	2.76	2.58	3.21	3.98	5.40	5.52	5.93	4.38	6.76	5.60	7.40	6.68
Total—																
Face	7.63	8.03	8.72	8.67	8.72	8.94	9.53	10.27	11.18	12.26	13.52	14.08	15.00	14.73	16.12	16.11
Overall	2.99	3.07	3.30	3.41	3.50	3.50	3.64	3.89	4.13	4.42	4.86	5.11	5.61	5.66	6.23	6.12
(b) Open Cuts (Overall)																
Central District	10.52	8.75	10.27	7.71	10.08	7.79	8.61	12.16	..	..	..	..	..	..	..	32.89
Northern District	16.83	23.67	14.84	22.03	34.71	22.78	28.85	15.95	17.58	17.69	16.45	17.16	19.23	18.54	17.63	14.83
									16.65	9.88	4.94	..	..	..	..	..
Total—																
Overall	12.47	10.91	11.01	8.48	13.16	9.73	11.15	12.51	17.50	17.11	15.63	15.83	18.75	18.49	17.60	15.31
TOTAL QUEENSLAND — Face	7.63	8.03	8.72	8.67	8.72	8.94	9.53	10.27	11.18	12.26	13.52	14.08	15.00	14.73	16.12	16.11
Overall	3.46	3.42	3.66	3.71	4.43	4.08	4.26	4.53	5.32	5.65	5.99	6.32	7.05	7.26	7.90	7.65

TABLE 15 - NUMBER OF MINE WORKERS EMPLOYED IN THE PRODUCTION OF BLACK COAL (OPEN CUT AND UNDERGROUND MINES) BY STATES

Year	N.S.W.	Victoria	Queensland	South Australia	Western Australia	Tasmania	Australia
Average Number Employed—							
1930	21,343	2,080	2,768	..	896	441	27,528
1931	15,522	1,897	2,362	..	752	363	20,896
1932	14,126	1,663	2,392	..	604	381	19,166
1933	12,910	1,517	2,448	..	626	313	17,814
1934	13,245	1,502	2,385	..	624	342	18,098
1935	12,788	1,397	2,455	..	689	358	17,687
1936	13,515	1,367	2,432	..	768	334	18,416
1937	13,828	1,359	2,442	..	728	322	18,679
1938	14,828	1,322	2,495	..	765	269	19,679
1939	16,144	1,376	2,615	..	752	238	21,125
1940	16,777	1,379	2,660	..	713	239	21,768
1941	16,812	1,295	2,886	..	778	233	22,004
1942	16,634	1,234	2,838	..	825	243	21,774
1943	16,808	1,263	2,881	..	838	278	22,068
1944	16,839	1,196	2,918	84	880	277	22,194
1945	17,020	1,016	2,968	91	860	278	22,233
1946	17,008	924	3,012	120	995	276	22,335
1947	17,204	860	3,337	134	1,032	289	22,856
No. Employed as at—							
1948, July 3rd	17,719	847	3,253	248	1,160	280	23,507
1949, July 2nd	18,187	774	3,377	362	1,121	314	24,135
1950, July 1st	18,208	788	3,544	430	1,124	324	24,418
1951, June 30th	18,665	776	3,493	447	1,133	321	24,835
Dec. 29th	19,026	720	3,587	437	1,182	350	25,302
1952, June 28th	20,191	810	3,738	463	1,310	355	26,867
Dec. 27th	20,310	918	3,801	385	1,383	338	27,135
1953, June 27th	19,283(b)	885	3,674	435	1,462	340	26,079
Dec. 26th	19,956	877	3,752	429	1,509	363	26,886
1954, June 26th	20,210	811	3,759	281(a)	1,596	371	27,028
Dec. 25th	19,547	774	3,747	265	1,553	370	26,256
1955, June 25th	19,417	739	3,728	262	1,360	374	25,880
Dec. 24th	18,498	699	3,661	250	1,297	376	24,781
1956, June 23rd	17,934	694	3,603	242	1,211	372	24,056
Dec. 22nd	17,713	657	3,670	227	1,099	346	23,712
1957, June 22nd	16,749	637	3,533	226	1,172	288	22,605
Dec. 21st	16,016	613	3,442	226	1,076	283	21,656
1958, June 21st	15,428	580	3,303	242	1,086	285	20,924
Dec. 20th	14,349	493	3,285	250	1,051	302	19,730
1959, June 20th	13,380	432	3,221	258	1,028	315	18,634
1960, Jan. 2nd	13,265	420	3,242	247	1,005	338	18,517
July 2nd	13,315	409	3,254	271	990	317	18,556
Dec. 31st	12,906	386	3,204	273	640	280	17,689
1961, July 1st	12,589	372	3,036	286	663	289	17,235
Dec. 30th	11,879	353	3,030	271	727	245	16,505
1962, June 30th	12,098	329	2,906	268	755	230	16,586
Dec. 29th	11,672	310	2,838	268	771	245	16,104
1963, June 29th	11,492	298	2,736	260	759	181	15,726
Dec. 28th	11,445	279	2,690	268	749	165	15,596
1964, June 27th	11,414	252	2,657	264	769	114	15,470
Dec. 26th	11,339	236	2,594	270	777	101	15,317
1965, June 26th	11,660	220	2,425	273	759	57	15,394
1966, Jan. 1st	11,880	210	2,419	278	742	66	15,595
July 2nd	11,905	196	2,339	282	733	59	15,514
No. on Long Service Leave (included above)							
1955, June 25th	227	3	48	..	11	1	290
1957, June 22nd	74	..	15	..	8	..	97
1958, June 21st	22	7	19	..	11	1	60
1959, June 20th	38	4	17	1	37	1	98
1960, July 2nd	62	..	26	..	43	2	133
1961, July 1st	62	8	43	1	1	2	117
1962, June 30th	70	4	66	1	2	4	147
1963, June 29th	74	3	34	..	26	..	137
1964, June 27th	68	10	12	1	9	..	100
1965, June 26th	64	..	19	..	29	1	113
1966, July 2nd	70	9	3	1	12	1	96

(a) Earlier figures include workers on other than mine work.

(b) Employment lowered by temporary dismissal of men involved in John Darling and Mt. Kembla disputes.

TABLE 16 - COAL PRICES NEW SOUTH WALES - AVERAGE F.O.R. COLLIERY PRICES BY DISTRICTS PER TON AS AT 30TH JUNE, 1947-1954.

District.	Cessnock, North West.	Newcastle.	Western.	Southern.	New South Wales.
All Mines—	s. d.	s. d.	s. d.	s. d.	s. d.
1947 (1st March)	19 6	17 10	14 6	21 3	18 6
1948	26 0	24 10	19 6	33 0	25 9
1949	33 5	29 5	23 4	33 9	30 7
1950	37 10	34 1	29 0	37 3	35 0
1951	53 2	45 1	38 9	49 1	47 5
1952	73 0	59 8	60 10	61 1	64 6
1953	70 0	57 3	57 3	64 10	63 4
1954	66 9	56 2	56 7	61 2	60 11
Underground Mines—					
1950	38 11	33 11	29 8	37 3	35 9
1951	55 4	44 8	37 7	49 1	48 4
952	74 2	58 10	51 0	61 1	63 2
1953	72 10	57 0	53 0	64 10	63 6
1954	69 1	56 1	53 8	61 2	61 1
Open Cuts—					
1950	33 9	38 6	28 1	....	31 3
1951	45 5	50 1	40 2	....	43 5
1952	67 9	72 11	76 9	....	72 5
1953	59 9	65 7	66 7	....	62 6
1954	54 1	67 9	66 10	....	59 1

AVERAGE F.O.R. COLLIERY PRICES—UNDERGROUND MINES—BY STATE OF MECHANISATION

		1953.	1954.
		s. d.	s. d.
Class A	All machine loaded *with* modern haulage facilities	57 2	55 10
Class B	All machine loaded *without* modern haulage facilities	59 6	58 4
Class C	Partly machine loaded	69 7	67 6
Class D	All hand loaded (employing *more* than 12 men underground)	65 9	62 0
Class E	All hand loaded (employing *not more* than 12 men underground)	54 8	55 1
New South Wales		63 6	61 1

AVERAGE PRICE OF COAL SHIPPED FROM NEWCASTLE.

Newcastle and Cessnock—N.W. Coals.	F.O.B.	F.O.W.		
	Newcastle.	Melbourne.	Adelaide.	Fremantle
	s. d.	s. d.	s. d.	s. d.
1949	45 2	69 0	66 6	81 7
1950	45 1	74 5	71 7	91 7
1951	61 8	104 1	90 9	116 3
1952	82 3	128 2	115 6	142 3
1953	83 6	134 2	123 7	165 0
1954	80 1	128 9	118 3	160 1

BUNKER PRICES (AUSTRALIAN CURRENCY).

Country and Delivery.	1949.	1950.	1951.	1952.	1953.	1954.
New South Wales—	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Sydney, trimmed	70 0	70 0	87 6	115 0	100 0	100 0
Newcastle, f.o.b.	60 0	60 0	75 0	97 6	85 0	85 0
Port Kembla, f.o.b.	60 0	60 0	75 0	100 0	100 0	100 0
United Kingdom—						
London, trimmed	123 0	123 8	152 7	180 5	180 5	172 9
Tyne, f.a.s.	94 2	94 2	116 1	141 2	141 2	134 11
New Zealand—						
Auckland, on s' ip's rail	76 7	125 10	138 3	140 1	143 10	143 10
South Africa—						
Capetown, trimmed	69 0	85 9	88 11	98 5	98 5	104 7
Derban, f.a.s.	52 2	60 8	63 9	73 3	73 3	76 1
India—						
Bombay, seaborne trimmed	151 9	139 8	161 9	118 10	164 0	153 0
Ceylon—						
Colombo, Indian trimmed	129 4	124 11	204 9	219 8	200 10	200 10
U.S.A.—						
New York, f.a.s.	74 6	107 1	110 9	114 9	115 9	115 7
Canada—						
Halifax, trimmed	101 10	139 1	137 4	161 0	155 7	164 9

TABLE 17 - COAL PRICES

N.S.W. UNDERGROUND AND OPEN CUT COAL— AVERAGE F.O.R. COLLIERY PRICES

These prices should be read in the light of the comment appearing in Part V of this Report.

At June	per ton $	At June	per ton $
1948	2.58	1958	5.51
1949	3.06	1959	5.29
1950	3.50	1960	5.34
1951	4.74	1961	5.39
1952	6.45	1962	5.30
1953	6.33	1963	5.24
1954	6.09	1964	5.16
1955	5.94	1965	5.08
1956	5.92	1966	5.03
1957	5.66		

Average Prices for the three areas were:—

	June, 1963 per ton $	June, 1964 per ton $	June, 1965 per ton $	June, 1966 per ton $
North	5.14	4.92	4.93	4.86
West	4.09	3.97	3.65	3.44
South	5.59	5.65	5.55	5.61

NOTE—A review has been made of the data from which the prices series have been calculated. The prices shown for the three areas are not comparable with prices previously published. The series for the whole state as published above is comparable. The figures shown have been revised, from and including 1957 onward.

TABLE 18 (a)

TOTAL COST OF SPECIFIC ITEMS AND TOTAL VALUE OF PRODUCTION AT THE MINES -
N.S.W. COAL INDUSTRY $'000

Itemised Costs	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1. Wages and Salaries Paid (Less value of Explosives sold)	38,268	38,546	38,576	37,156	36,590	34,442	38,446	38,542	37,582	37,182	39,714	43,715
2. Pension and Subsidy Fund - Owners Contribution	3,294	3,204	3,068	3,258	3,394	3,352	3,440	3,242	3,112	2,986	3,392	3,696
3. Workers Compensation Premiums less Rebate and Bonus Payments	3,658	2,970	2,834	2,632	2,804	2,644	2,584	2,470	2,196	1,814	1,806	2,237
4. Payroll Tax	936	936	936	894	874	816	922	928	900	898	960	1,064
5. Sub-total (Items 2-4)	7,888	7,110	6,860	6,784	7,072	6,812	6,946	6,640	6,208	5,698	6,158	6,997
6. Royalty (Government only)	822	858	874	890	908	858	1,054	1,106	1,138	1,178	1,250	1,529
7. Excise Duty and Equivalent Payments ..	992	994	962	1,016	1,006	878	642	590	480	490	520	539
8. Re-imbursement from L.S.L. Trust Account	-1000	-852	-456	-416	-448	-400	-636	-542	-604	-598	-602	-599
9. Stowage Contributions	574	496	480	450	48	34	22	20	18	12	..	..
10. Sub-total (Items 6-9)	1,388	1,496	1,860	1,940	757	1,370	1,082	1,174	1,032	1,082	1,168	1,469
11. Value of Electricity used	2,772	2,286	2,660	2,788	3,030	3,114	3,560	3,834	4,138	4,250	4,420	4,680
12. Value of Coal, Oil and other Fuel used ..	1,234	1,062	868	684	594	442	408	446	372	354	250	241
13. Value of Timber used	2,552	2,436	2,510	2,410	2,398	2,238	2,430	2,446	2,574	2,442	2,430	2,807
14. Value of Explosives used	2,040	1,826	1,896	1,792	1,886	1,664	1,536	1,402	1,220	1,094	956	961
15. Value of Other Materials and Repairs ..	7,904	7,896	8,420	8,330	8,936	8,520	10,188	12,530	13,816	13,732	14,798	16,672
16. Sub-total (Items 11-15)	15,902	15,508	16,354	16,004	16,844	15,978	18,122	20,658	22,120	21,872	22,854	25,361
17. Value of Output at Mine	87,582	86,728	83,750	83,604	83,112	78,742	89,076	94,394	94,068	90,838	97,252	112,103
18. Total Costs given in Items 1, 5, 10 and 16	63,446	62,860	63,650	61,784	62,020	58,602	64,596	67,014	66,942	65,834	69,894	77,542
19. Balance	24,136	23,868	20,100	21,820	21,092	20,140	24,480	27,380	27,126	25,004	27,358	34,561
Item 19 - Includes any costs not listed above, interest, rent, local rates, land tax, but the major portion consists of depreciation charges, and profit from which company tax is payable.												
20. Production of Saleable Coal. ('000 tons)	14,671	14,300	14,390	14,864	15,102	14,780	16,630	17,765	17,610	17,493	19,104	22,281
21. Average number of employees	19,987	19,286	17,941	16,661	15,474	13,444	13,277	12,512	11,998	11,526	11,367	11,673

TABLE 18 (b)

SUMMARY OF COST STRUCTURE

Cost and Value per Ton of Saleable Output	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	$ c	$ c	$ c	$ c	$ c	$ c	$ c	$ c	$ c	$ c	$ c	$ c
Wages and Salaries .. .. (1)	2 61	2 69	2 68	2 49	2 42	2 33	2 31	2 18	2 13	2 12	2 08	1 96
Wages on cost .. .. (5)	54	50	48	46	47	46	42	38	35	32	32	31
Levies .. .. (10)	9	12	12	13	10	09	07	07	06	06	07	07
Fuel, Materials and Repairs .. .. (16)	1 08	1 08	1 13	1 08	1 12	1 08	1 09	1 16	1 26	1 25	1 19	1 14
Total Itemised Costs .. .. .. (18)	4 32	4 39	4 41	4 16	4 11	3 96	3 89	3 79	3 80	3 75	3 66	3 48
Balance .. .. (19)	1 64	1 60	1 40	1 47	1 39	1 36	1 48	1 54	1 54	1 43	1 43	1 55
Total Value .. .. (17)	5 96	5 99	5 81	5 63	5 50	5 32	5 37	5 33	5 34	5 18	5 09	5 03

TABLE 18 (c)

SUMMARY OF COST STRUCTURE

Costs as a Percentage of Total Value		1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
		per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent
Wages and Salaries	(1)	43.7	44.9	46.1	44.3	44.0	43.7	43.2	40.8	40.0	40.9	40.9	39.0
Wages on costs	(5)	9.0	8.3	8.2	8.1	8.5	8.7	7.8	7.0	6.6	6.3	6.3	6.3
Levies	(10)	1.6	2.0	2.2	2.3	1.8	1.7	1.2	1.3	1.1	1.2	1.2	1.3
Fuel, Materials and Repairs ..	(16)	18.1	18.1	19.5	19.2	20.3	20.3	20.3	21.9	23.5	24.1	23.5	22.6
Total Itemised Costs	(18)	72.4	73.3	76.0	73.9	74.6	74.4	72.5	71.0	71.2	72.5	71.9	69.2
Balance	(19)	27.6	26.7	24.0	26.1	25.4	25.6	27.5	29.0	28.8	27.5	28.1	30.8
Total Value	(17)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 18 (d)

SUMMARY OF COST STRUCTURE

Cost per Employee		1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
		£	£	£	£	£	$	$	$	$	$	$	£
Wages and Salaries	(1)	957	999	1,075	1,112	1,182	2,562	2,894	3,080	3,132	3,226	3,494	3,745
Wages on-costs	(5)	197	184	191	204	229	506	524	530	518	494	542	599
Total (1) + (5)		1,154	1,183	1,266	1,316	1,411	3,068	3,418	3,610	3,650	3,720	4,036	4,344
Balance	(19)	604	593	560	655	682	1,498	1,844	2,188	2,260	2,170	2,406	2,961

Source of Data

1. Wages and Salaries Paid (less value of explosives used)

Source - Commonwealth Statistician, based on annual returns collected by the N.S.W. Mines Department. The instructions on the form state that Salaries and Wages should "show the total amount paid to employees (excluding drawings by working proprietors) including amounts capitalised as well as amounts charged to revenue. The amounts stated should be gross amounts (including holiday and sick pay and actual payments to employees for long service leave) before any deduction is made for purchase of explosives (to be shown separately in space provided) and for income tax, pensions, etc. Value of Miners' Coal should be excluded". The value of explosives sold to employees was obtained from the same source.

2. Pension and Compensation Subsidy Fund - Owners' Contribution

Source - The Report of Registrar of the funds gave information in respect to financial years. From this data, estimated figures for calendar years have been calculated, due attention being paid to the dates on which rates of contribution were varied.

3. Workers' Compensation Premium less Rebate and Bonus

Source - Coal Mines Insurance Pty. Ltd. - Premiums paid. Joint Coal Board Annual Reports - Bonus and Rebate paid.

4. Pay-roll Tax

Calculated by Joint Coal Board from Wages and Salaries Paid (see Item 1 above) due allowance being made for the exemptions.

6. Royalty.

Source - The N.S.W. Dept. of Mines supplied figures for financial years and from this data approximate payments for calendar years have been calculated.

7. Excise Duty and Equivalent Payments

Source - The Department of Customs supplied payments of excise duty and to these figures an allowance was added for the equivalent payment made by the State Coal Authority in lieu of Excise.

8. Re-imbursement of Employers' Long Service Leave Payments

The Report of the Auditor-General - Coal Mining Industry Long Service Leave Trust Fund, gave information in respect to financial years. From this data estimated figures for calendar years were calculated.

9. Stowage Contributions

Source - Coal Conservation Committee

11. Value of Electricity Used.

12. Value of Coal, Oil and Other Fuel Used.

13. Value of Timber Used.

14. Value of Explosives Used.

15. Value of Other Material and Repairs

Source - Items 11-15. Commonwealth Statistician, based on annual returns collected by the New South Wales Mines Department.

17. Value of Output at Mine.

Source - Commonwealth Statistician. This data is based on annual returns collected by the N.S.W. Mines Department. The instruction on the form reads, "Value of Saleable Output - Should relate to coal won during the year (including any unsold at end of year) and be taken as the total selling value to customers at the point of delivery; less freight, dues and transport charges other than transport costs arising from the operation of the mine's own railway or other transport facilities. The total selling value should include Excise Duty payable, and amounts transferred to Suspense Accounts. Where coal is sold through an agency the value shown shoudl include deferred payments, etc., received from the agency".

The information supplied to the Mines Department by certain "captive mines" whose coal is not strictly speaking sold is not on a comparable basis to that supplied by the rest of the industry, by virtue of the fact that no amount is included in the value for depreciation or profit.

Therefore, to the Statistician's "Total Value" has been added an amount in respect to those mines of the sum allowable for these items under the Joint Coal Boards price fixing formula.

TABLE 19 - QUEENSLAND - AUTHORISED PRICE INCREASES BETWEEN 20TH OCTOBER 1949 AND 30TH JUNE 1952.

District or Mine	Class of Coal	A Increase Per Ton s. d.	B Increase Per Ton s. d.	C Increase Per Ton s. d.	Total Increase Per Ton s. d.
Bluff	All Coal	13. 6	2. 0	7. 7	23. 1
Bowen Consolidated Mine	Large	17. 1	-	4. 4	21. 5
	Small	17. 1	-	8. 4	25. 5
	Unscreened	17. 1	-	6. 7	23. 8
	Navigation	17. 1	-	5.10	22.11
King Cole Mine (Mt. Mulligan)	Large	31. 6	-	5. 7	37. 1
	Other	31. 6	-	3. 1	34. 7
Darling Downs District - except Maranoa and Tannymorel Collieries	All Coal	11. 7	-	-	11. 7
Maranoa Colliery	All Coal	12.11	-	3. 4	16. 3
Tannymorel Colliery	Railway	20. 4	-	1. 7	21.11
	Other	20. 4	-	3	20. 7
Maryborough District except Burnett Colliery	All Coal	16. 4	1. 0		17. 4 *
Burnett Colliery	All Coal	15. 5	-	-	15. 5
West Moreton District Bundamba/Ipswich area	All Coal	13. 2	2. 0	2. 0	17. 2
West Moreton District Rosewood area	All Coal	13. 9	1. 0	3. 6	18. 3
Blair Athol District	All Coal	2. 1		4. 6	6. 7
Callide District	All Coal				
	ex Mine	10		2. 6	3. 4 ø
	ex Biloela	2. 8		2. 6	5. 2 ø
	ex Gladstone	12. 8		2. 6	15. 2 ø

* Average increase for all consumers throughout district

ø For Callide District, price adjustments refer to period 30/5/50 - 30/6/52 since the first price review relating specifically to coal prices other than "ex-Gladstone" was not made until 30/5/50.

A Wage and Award variations and costs imposed by Statute

B An allowance granted in certain districts to provide for development of expenditure

C Correction of district anomalies and declining profit margins occasioned by other rising cost factors.

TABLE 20 - QUEENSLAND - MAXIMUM PRICES PREVAILING AT 30TH JUNE 1950, 1951 AND 1952.

District or Mine	Class of Coal	30/6/1950 s. d.	30/6/1951 s. d.	30/6/1952 s. d.
Bluff District	Large	32.10	43. 6	51. 1
	Small	30. 7	41. 3	48.10
Bowen Consolidated Mine	Large	41. 3	48.11	57. 8
	Small	35. 9	47. 5	56. 2
	Unscreened	37. 6	47. 5	56. 2
	Navigation	39. 3	48. 5	57. 2
King Cole Mine (Mt. Mulligan)	Large		71. 0	86.11
	Other	52. 0	68. 6	84. 5
Darling Downs District - except Maranoa and Tannymorel Collieries	To Railways	32. 6	37.10	42. 6
	To Others	32.11	38. 3	42.11
Maranoa Colliery	All Coal	33. 0	38. 4	47. 8
Tannymorel Colliery	All Coal	43. 3	53. 2	62. 5
Maryborough District except Burnett Colliery	All Coal	45. 2 *	53. 7	60. 6
Burnett Colliery	Large	42.11	50. 4	56. 4
	Small	41. 3	48. 8	54. 8
West Moreton District Bundamba/Ipswich Area	All Coal	32. 7	42.10	48. 7
West Moreton District Rosewood Area	All Coal	34. 6	45. 6	51. 7
Blair Athol District	Duff	10. 1	10. 1	16. 2
	Coal	21. 1	21. 1	27. 2
Callide District				
Ex Mine	Large	17. 6	17. 6	20.10
	Other	16. 0	16. 0	19. 4
Ex Biloela	Large	24. 9	26. 3	29.11
	Other	23. 3	24. 9	28. 5
Ex Gladstone	Large	53. 9	63. 9	68.11
	Other	52. 3	62. 3	67. 5

* Average Price.

TABLE 21

AUSTRALIA - EX-MINE VALUE OF BLACK COAL BY STATES

$(A) per ton

	Queensland	New South Wales	Victoria	Tasmania	South Australia	Western Australia
1950	3.05	3.60	6.04	2.08	1.00	3.17
1951	3.63	4.88	8.13	2.58	2.06	4.02
1952	5.78	5.94	10.48	2.76	2.05	5.92
1953	4.66	5.79	12.46	3.88	2.06	6.95
1954	4.69	5.68	12.54	3.96	2.62	7.04
1955	4.90	5.66	12.22	4.08	3.42	6.83
1956	5.18	5.48	11.40	3.98	3.30	6.74
1957	5.38	5.27	9.04	3.98	2.99	6.08
1958	5.52	5.04	9.57	3.69	2.69	5.24
1959	5.67	4.78	10.07	4.42	2.74	5.17
1960	5.98	4.77	10.86	4.62	2.61	5.28
1961	5.86	4.68	9.74	4.78	2.39	4.38
1962	5.82	4.94	8.86	4.60	2.08	4.32
1963	5.88	4.80	11.64	4.07	1.82	4.40
1964	5.68	4.70	8.56	4.12	1.90	4.74
1965	5.56	4.65	8.62	3.93	1.62	4.44

TABLE 22 - NEW SOUTH WALES - AVERAGE WEEKLY CONSUMPTION OF BLACK COAL ('000 tons)
EXCLUDING MINE-WASHERY REFUSE AND DUMP LOSSES

CLASSIFICATION	1951–52	1952–53	1953–54	1954–55	1955–56	1956–57	1957–58	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65
1. Railways—Locomotives	29·1	27·9	29·6	29·9	29·9	27·2	22·5	20·0	20·0	19·5	15·8	14·0	13·3	12·7
2. Electricity—Railway Generation	20·8	52·7	56·8	61·4	61·4	66·2	69·9	71·9	75·6	76·4	79·1	81·8	92·6	94·4
3. Electricity—Other Generation	31·3													
4. Town Gas	17·7	18·1	18·1	18·9	18·0	17·7	16·2	15·8	16·4	16 0	15·2	13·9	14·0	13·9
5. Coke—Metallurgical	4·5	4·4	4·2	4·7	5·1	5·6	5·4	4·3	5·2	5·7	5·4	5·9	6·0	7·5
6. Lime, Plaster, Asphalt, Shale, etc.	0·9	0·5	0·4	0·4	0·4	0·3	0·3	0·4	0·5	0·5	0·5	0·5	0·5	0·5
7. Cement and Cement Goods	7·4	8·0	8·0	8·5	8·5	9·4	9·0	9·0	9·8	10·4	9·8	10·0	10·5	11·0
8. Bricks, Tiles, Pottery, etc.	5·6	5·4	5·7	5·6	5·7	5·5	5·7	5·8	6·5	6·8	6·5	6·5	6·7	6·6
9. Glass	2·2	1·9	2·0	2·3	2·7	2·6	2·5	2·6	2·5	2·6	3·0	2·5	2·7	2·7
10. Chemicals, Drugs, Medicines	1·5	1·3	1·9	2·0	2·0	2·0	2·0	2·1	2·0	1·9	1·7	1·9	1·9	1·9
11. Soap, Oils, Inks, Matches, Paint, etc.	1·0	0·9	0·9	0·8	0·8	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·8
12. Smelting, Refining and Rolling of Iron and Steel	55·4	62·5	65·0	65·5	64·2	71·3	73·9	77·4	82·8	95·2	98·8	99·5	104·9	113·3
13. Other Engineering and Metal Trades	3·4	3·2	3·1	3·2	2·5	2·2	2·1	2·2	2·3	2·1	1·9	1·9	1·9	1·8
14. Textile and Clothing	1·5	1·4	1·5	1·7	1·6	1·6	1·6	1·7	2·1	1·9	1·7	1·8	1·8	1·8
15. Skin and Leather	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
16. Food—Brewing and Malting	0·7	0·7	0·7	0·6	0·4	0·4	0·5	0·5	0·5	0·5	0·5	0·5	0·5	0·5
17. Food—Milk and Meat Processing	2·5	2·8	2·7	2·8	2·9	2·4	2·4	2·5	2·6	2·5	2·6	2·4	2·4	2·2
18. Food—Sugar Refining	2·2	2·0	2·0	2·2	2·2	1·9	1·8	1·7	1·6	1·5	1·4	1·3	1·3	1·5
19. Food—Other, Tobacco, etc.	1·7	1·5	1·5	1·5	1·3	1·1	1·0	1·0	1·0	0·9	1·0	0·9	0·9	0·9
20. Woodworking, Furniture	0·5	0·5	0·6	0·7	0·7	0·7	0·7	0·7	0·7	0·6	0·6	0·6	0·6	0·6
21. Paper and Printing	1·4	0·9	1·1	1·3	1·3	1·5	1·5	1·6	1·8	1·8	2·0	2·2	2·6	2·9
22. Rubber	0·9	0·7	0·8	0·8	0·9	0·9	0·9	0·7	0·7	0·7	0·6	0·7	0·8	0·8
23. Hotels, Institutions, Miscellaneous Industries	0·2	0·2	0·1	0·1	0·1	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1	0·1
24. Laundries and Dry Cleaners	0·2	0·2	0·2	0·2	0·1	0·1	0·1	0·1	0·2	0·2	0·1	0·1	0·1	0·1
25. Water Supply	1·2	1·1	1·1	1·1	1·1	1·3	1·2	1·2	1·1	1·1	1·1	1·1	1·0	1·2
26. Hospitals	1·5	1·5	1·5	1·5	1 5	1·5	1·4	1·4	1·6	1·6	1·6	1·8	1·9	1·9
27. Tugs, Haulage and Lighterage	0·9	1·0	0·8	0·8	0·6	0·6	0·6	0·6	0·5	0·5	0·4	0·3	0·3	0·3
28. Bunkers (a)	7·5	6·7	6·4	6·0	5·6	4·5	4·4	3·9	3·1	2·6	1·9	2·2	2·8	2·0
29. Miners' Coal	1·7	1·6	1·5	1·5	1·4	1·3	1·1	1·0	0·9	0·8	0·7	0·6	0·6	0 5
30. Colliery Consumption	3·4	3·3	3·0	2·6	2·4	2·3	2·1	1·9	1·8	1·8	1·6	1·5	0·7	0·5
31. Small Industrial and Domestic Consumers (estimated)	1·3	1·7	1·8	1·4	1·4	1·4	2·1	3·0	1·2	2·4	1·4	1·5	1·0	0·9
Consumers' Total	210·2	214·7	223·1	230·1	226·8	234·4	233·8	235·9	246·0	259·4	257·8	258·8	275·2	285·9

(a) Coal is regarded as consumed on the date on which it is placed in the ships' bunkers at the port of supply, irrespective of the destination of the ships.

(b) 53 week year

TABLE 23 - NEW SOUTH WALES COAL SENT TO CONSUMERS OR EXPORTED FROM NEW SOUTH WALES - BY PRODUCTION AREA ('000 tons) 1963-64 TO 1965-66.

	South Maitland	North West	Newcastle	West	Burragorang Valley	South Coast	N.S.W.
Year 1963-64—							
N.S.W. Consumers—							
Iron and Steel (*a*)	36	80	2,279	..	179	3,021	5,595
Electricity Generation	86	238	2,515	878	181	1,084	4,982
Railways—Locomotive	53	449	..	117	29	35	683
Town Gas	540	192	..	18	4	..	754
Cement	..	..	..	304	41	176	521
Metallurgical Coke (Other)	..	..	..	..	1	309	310
Other Consumers	163	88	794	254	181	131	1,611
Total	878	1,047	5,588	1,571	616	4,756	14,456
Exported—							
Interstate	765	10	367	..	..	..	1,142
Overseas—Japan	79	366	..	..	1,042	1,239	2,726
—Others	85	8	42	..	130	4	269
Total	929	384	409	..	1,172	1,243	4,137
Total All Destinations	1,807	1,431	5,997	1,571	1,788	5,999	18,593
Inter-district Transfers, Stock Variation at Ports, Merchants and in Transit	..	..	..	..	+ 67	— 22	+ 45
Total Deliveries from Mines	1,807	1,431	5,997	1,571	1,855	5,977	18,638
Total of "Tied" Sales	74	151	4,008	919	115	3,941	9,208
Total of "Non-Tied" Sales	1,733	1,280	1,989	652	1,740	2,036	9,430
Year 1964-65—							
N.S.W. Consumers—							
Iron and Steel (*a*)	30	74	2,626	3	169	3,048	5,950
Electricity Generation	117	270	2,878	825	136	879	5,105
Railways—Locomotive	55	458	..	91	29	20	653
Town Gas	561	121	1	16	4	..	703
Cement	..	..	..	308	49	214	571
Metallurgical Coke (Other)	..	..	..	..	2	391	393
Other Consumers	164	99	785	309	172	111	1,640
Total	927	1,022	6,290	1,552	561	4,663	15,015
Exported—							
Interstate	645	12	389	..	..	..	1,046
Overseas—Japan	485	911	38	..	1,386	1,488	4,308
—Others	98	21	52	..	197	..	368
Total	1,228	944	479	..	1,583	1,488	5,722
Total All Destinations	2,155	1,966	6,769	1,552	2,144	6,151	20,737
Inter-district Transfers, Stock Variation at Ports, Merchants and in Transit	+ 2	+ 4	— 5	..	+ 52	+ 4	+ 57
Total Deliveries from Mines	2,157	1,970	6,764	1,552	2,196	6,155	20,794
Total of "Tied" Sales	85	175	4,569	683	136	4,184	9,832
Total of "Non-Tied" Sales	2,072	1,795	2,195	869	2,060	1,971	10,962
Year 1965-66 (*b*)—							
N.S.W. Consumers—							
Iron and Steel (*a*)	7	84	2,677	55	237	3,032	6,092
Electricity Generation	86	284	3,422	845	136	1,003	5,776
Railways—Locomotive	39	381	..	45	26	5	496
Town Gas	524	139	1	16	4	..	684
Cement	..	..	..	333	50	182	565
Metallurgical Coke (Other)	..	..	..	..	..	406	406
Other Consumers	90	93	707	296	171	90	1,447
Total	746	981	6,807	1,590	624	4,718	15,466
Exported—							
Interstate	559	12	413	..	..	..	984
Overseas—Japan	668	1,440	205	..	1,774	1,668	5,755
—Others	117	15	70	..	244	..	446
Total	1,344	1,467	688	..	2,018	1,668	7,185
Total All Destinations	2,090	2,448	7,495	1,590	2,642	6,386	22,651
Inter-district Transfers, Stock losses and variation at Ports, Merchants and in Transit	+ 38	+ 11	— 5	— 1	+ 87	— 61	+ 69
Total Deliveries from Mines	2,128	2,459	7,490	1,589	2,729	6,325	22,720
Total of "Tied" Sales	73	191	5,323	733	136	4,512	10,968
Total of "Non-Tied" Sales	2,055	2,268	2,167	856	2,593	1,813	11,752

(*a*) Includes bunkers for bulk carriers of the steel industry. (*b*) 53-week year.

TABLE 24

CAPTIVE AND NON-CAPTIVE MINES PRODUCTION ('000 tons)

NEW SOUTH WALES

Year	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963-64	1964-65	1965-66	1965-66 per cent
Cessnock - North West-																	
Captive to Public Utilities ...	..	..	13	85	95	106	116	121	145	137	185	198	262	250	272	54	0.2
Non-Captive	4,401	4,512	4,929	4,838	5,028	4,785	4,844	4,643	4,586	3,788	4,487	4,515	4,459	3,493	4,030	5,143	20.6
Total	4,401	4,512	4,942	4,923	5,123	4,891	4,960	4,764	4,731	3,925	4,672	4,713	4,721	3,743	4,302	5,197	20.8
Newcastle -																	
Captive to Public Utilities ...	364	635	873	751	887	894	796	1,025	1,170	1,153	1,360	1,303	1,292	2,033	2,174	2,417	9.7
Captive to Steel Industry	1,267	1,155	1,256	1,032	1,138	1,191	1,256	1,503	1,547	1,757	1,765	1,838	1,822	1,941	2,043	2,362	9.4
Non-Captive	2,295	2,256	2,555	2,337	2,399	2,314	2,159	1,916	2,136	2,503	2,627	2,524	2,223	2,533	2,987	3,372	13.5
Total	3,926	4,046	4,684	4,120	4,424	4,399	4,211	4,444	4,853	5,413	5,752	5,665	5,337	6,507	7,204	8,151	32.6
West -																	
Captive to Public Utilities ...	260	275	298	292	450	473	423	444	481	513	547	592	628	659	396	414	1.7
Captive to Cement Industry ...	236	220	192	209	227	240	212	253	274	281	293	308	308	297	302	330	1.3
Non-Captive	1,572	1,952	2,130	1,621	1,493	1,139	1,023	929	819	768	738	686	582	677	912	925	3.7
Total	2,068	2,447	2,620	2,122	2,170	1,852	1,658	1,626	1,574	1,562	1,578	1,586	1,518	1,633	1,610	1,669	6.7
South -																	
Captive to Public Utilities ..	22	21	46	151	249	280	319	565	641	697	751	906	915	996	1,068	1,054	4.2
Captive to Steel Industry	1,021	1,070	1,123	1,086	1,216	1,294	1,538	1,650	1,691	1,731	1,882	2,181	2,358	2,743	2,919	3,346	13.4
Captive to Cement Industry ...	119	129	142	166	177	718	210	192	177	149	156	158	145	158	164	159	0.6
Non-Captive	1,241	1,288	1,465	1,606	1,725	1,302	1,914	2,149	2,184	2,235	2,946	3,812	4,036	4,458	4,547	5,435	21.7
Total	2,403	2,508	2,776	3,009	3,367	3,594	3,981	4,556	4,693	4,812	5,735	7,057	7,454	8,355	8,698	9,994	39.9
New South Wales -																	
Captive to Public Utilities ..	646	931	1,230	1,279	1,681	1,753	1,654	2,155	2,437	2,500	2,843	2,999	3,097	3,938	3,910	3,939	15.8
Captive to Steel Industry.....	2,288	2,225	2,379	2,118	2,354	2,485	2,794	3,153	3,238	3,488	3,647	4,019	4,180	4,684	4,962	5,708	22.8
Captive to Cement Industry ...	355	349	334	375	404	958	422	445	451	430	449	466	453	455	466	489	1.9
Total Captive	3,289	3,505	3,943	3,772	4,439	5,196	4,870	5,753	6,126	6,418	6,939	7,484	7,730	9,077	9,338	10,136	40.5
Total Non-Captive-																	
Underground	7,907	7,721	8,549	8,680	9,265	8,638	9,129	8,911	9,034	8,882	10,085	10,728	10,502	10,546	11,641	13,948	55.8
Open Cut	1,602	2,287	2,530	1,722	1,380	902	811	726	691	412	713	809	798	615	835	927	3.7
Total	12,798	13,513	15,022	14,174	15,084	14,736	14,810	15,390	15,851	15,712	17,737	19,021	19,030	20,238	21,814	25,011	100.0
Captive Output as a Percentage of Total Output	26	26	26	27	29	35	33	37	39	41	39	39	41	45	43	41	

A "captive" mine is defined as a mine owned or controlled by the authority or company to which the whole, or a substantial portion, of the output is supplied, and may include mines operated by the State Mines Control Authority.

Mines in this category are:-

(a) Controlled by State Mines Control Authority - Awaba, Munmorah, Wyee (and in earlier years Lithgow, Liddell and Oakdale);

(b) controlled by the Electricity Commission of N.S.W. - Huntley, Newcom, Newstan, Newvale, Ulan;

(c) controlled by B.H.P. - Burwood, John Darling, Lambton, Stockton Borehole, Pacific from January, 1965, and Metropolitan from July, 1965;

(d) controlled by A.I. & S. - Appin, except for 1964-65; Bulli, Kemira, Nebo, Wongawilli and Mount Kembla, except for 1965-66;

(e) controlled by cement companies - Charbon, Ivanhoe No. 2, Kandos No. 2 and No. 3, Berrima (and in earlier years Kandos Coomber, Ivanhoe No. 1 and No. 3, Loch Catherine);

(f) controlled by North West County Council - Ashford Open Cut.

TABLE 25 - OVERSEAS COAL SHIPMENTS
FROM NEW SOUTH WALES ('000 tons)

	1961-62	1962-63	1963-64	1964-65	1965-66 (*a*)
By Destination—					
Japan	2,962	2,243	2,726	4,308	5,755
New Caledonia	51	36	134	197	244
Pakistan	63	18	23	87	26
Korea	37	74	70	32	47
Hong Kong	11	..	11	23	63
Ceylon	10	7	17	12	19
Malaysia	14	15	8	3	5
Burma	..	30	..	..	..
Fiji	5	5	6	4	1
New Zealand	9	3	..	..	32
Eritrea	..	..	..	10	..
Taiwan	..	..	..	..	9
Total	3,162	2,431	2,995	4,676	6,201
By Port of Shipment—					
Newcastle	1,641	577	574	1,601	2,509
Sydney	724	1,021	1,179	1,587	2,024
Port Kembla	797	833	1,242	1,488	1,668
Total	3,162	2,431	2,995	4,676	6,201
By Production Area—					
South Maitland	475	166	164	583	784
North West	921	328	374	932	1,455
Newcastle	249	88	42	90	276
West	..	..	..	..	..
Burragorang Valley	723	1,016	1,172	1,583	2,018
South Coast	794	833	1,243	1,488	1,668
Total	3,162	2,431	2,995	4,676	6,201

(*a*) 53-week year

TABLE 26

CARGO EXPORTS (a) OF BLACK COAL ('000 tons)
FROM NEW SOUTH WALES

EXPORTED TO -	VICTORIA			SOUTH AUSTRALIA			QLD.	W.A.	TAS.	NTHRN. TERR.	TOTAL INTER-STATE	NEW CALE-DONIA	FIJI TO 1953 JAPAN FROM 1954	OTHERS (d)	TOTAL OVERSEAS	TOTAL EXPORT	PERCENTAGE OF N.S.W. PRODUCTION EXPORTED
YEAR OR PERIOD	Sea	Rail	Total	Sea	Rail	Total	Sea	Sea	Sea	Sea							
1947-48 (b) ..	1284.4	192.8	1477.2	831.8	37.8	869.6	13.0	112.3	65.5	0.5	2538.1	25.9	23.8	3.6	53.3	2591.4	21.7
1948-49	1161.9	236.8	1398.7	832.6	22.6	855.2	16.9	121.4	49.0	1.4	2442.6	12.6	18.5	2.0	33.1	2475.7	21.3
1949-50	1021.8	134.1	1155.9	722.4	3.5	725.9	17.4	84.3	51.5	0.4	2035.4	53.5	7.3	2.6	63.4	2098.8	18.6
1950-51	999.9	131.4	1131.3	655.4	-0.6	664.8	13.0	91.6	55.2	0.0	1955.9	54.2	12.7	0.3	67.2	2023.1	16.0
1951-52	1168.4	237.2	1405.6	934.2	0.0	934.2	16.0	87.1	49.7	..	2492.6	103.8	17.8	5.3	126.9	2619.5	17.8
1952-53	1162.2	141.9	1304.1	922.2	..	922.2	9.6	67.2	31.0	..	2334.1	139.3	20.8	72.7	232.8	2566.9	18.0
1953-54	1326.4	36.5	1362.9	989.1	..	989.1	12.9	66.5	29.6	..	2461.0	156.4	..	233.7	390.1	2851.1	19.1
1954-55	1166.8	84.0	1250.8	984.4	..	984.4	11.1	61.4	43.0	..	2350.7	164.2	..	116.8	281.0	2631.7	18.0
1955-56	1090.1	69.4	1159.5	854.1	1.1	855.2	9.6	69.4	54.3	..	2148.0	145.2	9.4	49.1	203.7	2351.7	16.2
1956-57	991.0	28.6	1019.6	856.7	..	856.7	10.7	82.4	34.2	..	2003.6	189.5	229.1	136.7	555.3	2558.9	16.8
1957-58	961.0	5.3	966.3	846.5	..	846.5	10.1	69.0	22.7	..	1914.6	164.8	424.8	196.4	786.0	2700.6	17.3
1958-59	1021.2	8.0	1029.2	753.1	..	753.1	9.4	43.0	24.2	..	1858.9	140.2	376.1	186.4	702.7	2561.6	16.3
1959-60 (b) ...	979.8	12.1	991.9	867.3	..	867.3	11.9	54.9	25.1	..	1951.1	146.2	878.7	123.7	1148.6	3099.7	18.2
1960-61	873.0	6.1	879.1	640.7	..	640.7	8.6	59.8	22.2	..	1610.4	111.9	1652.5	84.3	1848.7	3459.1	19.0
1961-62	743.2	..	743.2	471.4	..	471.4	12.2	43.3	20.5	..	1290.6	50.9	2961.8	149.5	3162.2	4452.8	23.3
1962-63	658.9	..	658.9	477.0	..	477.0	10.7	52.0	24.0	..	1222.6	36.0	2243.1	152.2	2431.3	3653.9	19.5
1963-64	661.9	..	661.9	425.5	..	425.5	10.6	29.8	14.5	..	1142.3	134.0	2726.1	134.8	2994.9	4137.2	20.4
1964-65	637.8	..	637.8	354.8	..	354.8	3.3	34.3	16.0	..	1046.2	196.6	4308.5	170.5	4675.6	5721.8	26.2
1965-66 (c) ...	590.1	..	590.1	343.0	..	343.0	..	36.4	13.9	..	983.4	243.8	5755.0	202.5	6201.3	7184.7	28.7

(a) Bunkers supplied to overseas ships are not regarded as exports but as being consumed at port of supply.

(b) 54 week year

(c) 53 week year

(d) Includes Fiji from 1954.

TABLE 27

EXPORTS OF QUEENSLAND COAL

For Years ended 30th June, 1950 to 1966

Year	Interstate	Overseas	Total
	Tons	Tons	Tons
1949-1950	4,847	..	4,847
1950-1951	44,037	..	44,037
1951-1952	101,456	11,933	113,389
1952-1953	235,748	36,941	272,689
1953-1954	98,957	7,674	106,631
1954-1955	131,857	..	131,857
1955-1956	115,430	..	115,430
1956-1957	94,307	..	94,307
1957-1958	101,660	13,232	114,892
1958-1959	17,949	..	17,949
1959-1960	..	38,183	38,183
1960-1961	..	46,926	46,926
1961-1962	..	292,089	292,089
1962-1963	..	239,788	239,788
1963-1964	1,552	800,706	802,258
1964-1965	..	1,188,180	1,188,180
1965-1966	..	1,647,981	1,647,981

Note: 1959-1963 Queensland Coal Board

1963-1966 C.B.C.S. Overseas Trade Bulletin and A.M.I. Annual Review

TABLE 28 - VICTORIA - CONSUMPTION OF BROWN COAL ('000 tons)

	1954/55	1963/64	1964/65
Generation of electric power—			
Power stations	6,741	12,029	13,323
Briquette factories		538	
Fuel in other factories	1,088	894	920
Material in briquette production	1,684	5,192	5,251
Balance of production available for other consumption or stock accumulation	155	30	80
Total disposals	9,668	18,683	19,574

APPENDIX 1

NEW SOUTH WALES COAL RESERVES

The figures available at 30th June, 1963, for New South Wales coal reserves are:—

Coalfield	Reserves	
	Measured and Indicated '000,000 tons	Inferred (1)
Newcastle	770 (2)	Large.
Cessnock-Maitland	180 (2)	Large.
East Maitland	35 (2)	Uncertain—could range from small to large.
Singleton-Muswellbrook	900 (3)	Very large.
Western (including Ulan)	250 (4)	Very large.
Southern and South Western	900 (5)	Very large.
Tamworth-Gunnedah	40	Small.
Ashford	5	Very small.
Far North Coast	0·5	Uncertain—could range from very small to large.
Coorabin-Oaklands	Not determined (6)	Uncertain—could range from very small to large.
Griffith	Not determined (7)	Uncertain—could range from very small to large.

(1) All inferred reserves are calculated as "total reserves in situ" i.e., no factor has been applied to reduce them to recoverable reserves.

Very large—More than 10,000 million tons.
Large—100 million to 10,000 million tons.
Small—20 million to 100 million tons.
Very small—Less than 20 million tons.

(2) Calculated as recoverable reserves.

(3) Calculated as recoverable reserves but contains a considerable quantity suitable only if power stations are developed on the field.

(4) Based on data supplied by colliery managers, but assessed by Joint Coal Board as reasonable for recoverable reserves.

(5) Calculated as extractable reserves—extraction ranging from 70 per cent. to 85 per cent. depending on efficiency of individual colliery. Under stored waters (and in other areas for which mining is restricted by lease conditions), it has been accepted that only 50 per cent. extraction will be achieved. Maximum ash 33 per cent.

(6) Of minor commercial significance at present.

(7) Brown coal deposits. Of no commercial significance at this stage.

GENERAL COMMENTS—

(*a*) Coal with cover in excess of 3,000 ft. excluded.

(*b*) Seams with thickness less than 4 ft. excluded.

(*c*) It has not been possible to calculate reserves for all of New South Wales with constant factors applied. Much could be done relative to those areas in and around working or worked collieries, but even this would represent a small part only of the total reserves. The term "recoverable" for this Table implies that the coal can be won and sold at a profit either now or in the future. The existing state of affairs will continue until a comprehensive testing programme (principally by drilling) has been undertaken throughout the coalfields of New South Wales. Accuracy is NOT claimed for these figures, but they are more reliable than those published earlier. This does not mean that New South Wales is short of coal reserves, but it does mean that there is insufficient knowledge of the reserves to permit any more realistic figures being quoted.

(*d*) The above reserves may be sub-divided on the basis of utilisation as follows:—

Coalfield	Utilisation	Measured and Indicated Reserves (Million Tons)
Newcastle	Coking	290
	Steam Raising and General Purposes	480
Cessnock-Maitland	Town Gas Production, Steam Raising and General Purposes.	180
East Maitland	Steam Raising and General Purposes	35
Singleton-Muswellbrook	Steam Raising and General Purposes (Greta Coal Measures).	230
	Steam Raising, General Purposes and Soft Coking (Singleton Coal Measures).	670 (1)
Western	Steam Raising and General Purposes	250
Southern and South Western	Coking	720
	Steam Raising and General Purposes	180 (2)
Tamworth-Gunnedah	Steam Raising and General Purposes	40
Far-North Coast	Steam Raising and General Purposes	0.5

(1) Includes about 200 million tons of soft coking coal.

(2) Includes Tongarra Seam, part of which could be used for coke manufacture.

APPENDIX 2

AUSTRALIAN COAL RESOURCES

Report By Chief Geologist, Joint Coal Board

PART I. Reserves of coal within known basins.
PART II. The possibility of significant new coal discoveries outside known coal basins.

PART I

Reserves of Coal within Known Basins

ESTIMATES OF COAL RESERVES

1. The latest figures available for reserves of coal in Australia, excluding lignite and brown coal, are set out in the following table (for references see Appendix A).

TABLE 1

State	Reserves '000,000 tons	
	Measured and Indicated	Inferred
New South Wales	2950·5(1)	Very large (2)
Queensland	1243·4(2)	Very large(2)
Western Australia	282 (2)	1597
South Australia	48·5(4)	Very small(5)
Tasmania	Very small(5)	137
Victoria	20 (2)	11
Northern Territory	Nil	Nil

(1) Calculated as Recoverable Reserves.
(2) Calculated as total reserves in situ.
Very large—more than 10,000 million tons
Large—100 million to 10,000 million tons
Small—20 million to 100 million tons
Very small—less than 20 million tons
(3) 119 million tons considered extractable.
(4) Calculated as Recoverable Reserves.
(5) Measured reserves amount to only several hundred thousand tons. Figure of 137 million tons was quoted in C.U.R.A.C. Report for Indicated and Inferred Reserves —i.e. reserves in situ, and some of this coal has no economic value at present.

2. Further sub-division on the basis of utilisation can be made as follows:—

TABLE 2

State and Coalfield	Utilisation	Measured and Indicated Reserves
		'000,000 tons
New South Wales(1)—		
Newcastle	Coking	290
	Steam raising and general purposes	480
Cessnock-Maitland	Town gas production, steam raising and general purposes	180
East Maitland	Steam raising and general purposes	35
Singleton-Muswellbrook	Steam raising and general purposes (Greta Coal Measures)	230
	Soft coking (Singleton Coal Measures)	300
	Steam raising and general purposes (Singleton Coal Measures)	370
Western	Steam raising and general purposes	250
Southern and South-Western	Coking	400
	Steam raising and general purposes	375
Tamworth-Gunnedah	Steam raising and general purposes	40
Far North Coast	Steam raising and general purposes	0·5
Queensland—		
Collinsville	Strong coking	122·0
	Steam raising and general purposes	79·0
Nebo	Steam raising and general purposes	24·5
Blair Athol	Steam raising and general purposes	266·0
Styx	Soft coking	2·0
	Gas production, steam raising and general purposes	2·0
Bluff	Steam raising and general purposes	..
Blackwater	Strong coking	50·0
	Steam raising and general purposes	253·0
Baralaba	General purposes	5·5
Moura	Strong coking	39·0
Kianga	Soft coking	31·0
Callide	Steam raising and general purposes	70·0
Selene	Gas production, steam raising and general purposes	6·0
Burrum	Soft coking	3·0
	Gas production, steam raising and general purposes	2·9
Darling Downs	Gas production, steam raising and general purposes	13·5
North Ipswich	Medium coking	32·0
	Steam raising and general purposes	15·5
Rosewood	Gas production, steam raising and general purposes	15·5
Bundamba	Soft coking	32·0
	Steam raising and general purposes	179·0
Western Australia(1)—		
Collie	Gas production, steam raising and general purposes	119
South Australia(1)—		
Leigh Creek	Steam raising and general purposes	48·5
Tasmania—		
Whole State	Gas production, steam raising and general purposes	Very small (see Table 1, Note (5))
Victoria—		
Wonthaggi	Gas production, steam raising and general purposes	14
Korumburra	Gas production, steam raising and general purposes	4
Berry's Creek	Gas production, steam raising and general purposes	2

(1) Calculated as Recoverable Reserves.

MAP OF AUSTRALIA

Showing

COAL MEASURES

REFERENCE:

Black Coal shown thus ■

JOINT COAL BOARD No DS-141 c, 2-4-65, F.R.

New South Wales

3. Calculation of coal reserves in New South Wales has been made in the past with progressively refined degrees of accuracy. More recently particular attention has been given to the technique of measurement, including standardisation of methods for calculation, and studies of extraction losses. In fact, through refinements in technique, the 1955 published figure(1) of approximately 11,000 million tons of extractable reserves of measured and indicated coal, has been progressively reduced by approximately 8,000 million tons, notwithstanding the delineation of additional measured and indicated reserves in the interim.

4. An important consideration in the reporting of reserves is the grouping of coals according to potential use. This depends on the availability of detailed coal analysis information. One of the shortcomings of earlier drilling was the failure either to obtain or, alternatively, to record analysis results in full. In many parts of the coalfields the only information available is the depth to and thickness of seams penetrated; thus, the earlier drilling was in many places wasted to a large degree.

5. Although coal exploration work is being carried out in the State on a continuing basis, the tempo is such that actual knowledge of coal reserves is limited to not more than 15 per cent of the superficial areas of known coal bearing land. This unsatisfactory situation is probably attributable in part to complacency engendered by the belief that extensive coal deposits exist in partially explored areas. The danger of this complacency is well illustrated in the Southern or Illawarra Coalfield. It was previously widely assumed that the coking coals worked in the coastal area of the Southern field extended continuously to the South-Western (Burragorang Valley) Coalfield, thus providing a huge untapped reserve of premium grade coking coal. Recent drilling by the New South Wales Department of Mines has greatly reduced earlier assessments of potential reserves and has indicated the fallaciousness of this assumption.

Queensland

6. A cubic yard of coal weighs approximately 1 ton. With 18,000 square miles of coal-bearing area known to contain workable coal seams and no more than 1,243 million tons of measured and indicated reserves proved, knowledge of coal reserves in Queensland is undoubtedly deficient.

7. As in New South Wales, drilling in the past has been largely concentrated in regions close to markets or ports. Little attention was given to the Bowen Basin. However, since the late 1950's, under the stimulus of a growing export market, interest in the Basin has quickened.

8. Many of Queensland's coal seams are lenticular and contain a relatively high proportion of stone bands. These characteristics, together with the frequent structural disturbances within the coal measures, have necessitated in general a closer pattern of drilling than that commonly required in New South Wales to obtain seam detail for the calculation of reserves.

Western Australia

9. The Collie Basin is the only coalfield in Western Australia where coal has been produced commercially to-date. Table 1 indicates that the quantity of measured and indicated reserves within the Basin are relatively small compared with the inferred reserves. Further delineation of reserves in this area is clearly required if it is to continue as the State's coal supplier.

10. The lenticularity of seams, and their thinness and poor quality, coupled with remoteness from markets, has precluded development in other areas. This situation could conceivably change in the north-west, where the exploitation of iron ore deposits, including pelletisation of the ore, might bring a new significance to even sub-bituminous coal deposits, if found within economic range. There could be merit therefore in prospecting parts of the Fitzroy-Canning Basin within easy reach of shipping points, although the prospects of finding economic deposits in the area are not promising (para. 14, Pt. II). In considering this possibility it is necessary to take cognizance of the fact that if oil and/or gas become available locally there would probably be no market for coal.

South Australia

11. Extensive prospecting operations have indicated that the Leigh Creek area contains the only deposit of economic significance in South Australia. Systematic proving operations in this area have delineated both open-cut and underground coal reserves, although it is unlikely that the latter will be exploited(2).

12. There appears to be no justification for further large scale black coal prospecting in South Australia.

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(1) Power Survey Report No. 3-1955. Standards Association of Australia.

(2) C.U.R.A.C. Report—p. 134, table 5 (notes).

Victoria

13. As mentioned earlier the South Gippsland area is the only area likely to contain economic coal deposits. It is significant that the main producing mines at Wonthaggi are currently not considered economic, but are maintained as a matter of Government policy. Other small privately owned mines in the adjacent Jumbunna-Korumburra area are producing limited quantities of coal at a small profit. Geological conditions in the South Gippsland area are not conducive to low extraction costs. A combination of lenticularity and low thickness of coal seams together with severe faulting and igneous intrusion does not favour future extensive exploitation of these areas. A further factor is the availability of cheap brown coal in the State.

14. In the circumstances there appears to be no strong justification at present for large scale black coal prospecting in Victoria.

Tasmania

15. Proved reserves of coal in Tasmania are very small and are virtually limited to mine workings and their immediate environs.

16. With its large hydro-electric potential Tasmania has had no need to depend upon coal resources for power generation. In other States coal has been the principal fuel, and, as a consequence, extensive prospecting programmes to prove reserves for power station use have been carried out. Whilst the coal industry in other States has benefited from increased power consumption, the industry in Tasmania has gradually dwindled. In the circumstances it is not surprising that little prospecting has been carried out in recent years.

17. Apart from the possibility of a coal fired thermal station being required as an interim measure pending the development of further hydro-electric potential it is unlikely that new coal markets will be found. In the circumstances it would be difficult to justify extensive coal exploration operations.

GAINING KNOWLEDGE OF OUR COAL RESOURCES

General

18. Scientific knowledge is of two types—observed facts and deductions or inferences from these facts. With regard to our coalfields, there is an inadequacy of basic data on which to build scientific inferences, and too often within the coal industry too much reliance is placed on inferences alone, without sufficient checking or testing.

Collection of Data

19. Geological data on the occurrence, structure and quality of coal seams are derived from two main sources:—

(a) *Exploratory Drilling.* Systematic prospect drilling is the quickest, cheapest and surest means of obtaining the information required for the accurate assessment of coal reserves outside colliery workings and the planning of future development. Such drilling will yield details of the thickness, quality and structure of seams, the likely roof and floor conditions, and the gas or water content. Modern standards of drilling, corelogging, survey and analysis ensure a yield of accurate data.

(b) *Observations in Mine Workings.* Systematic recording of geological data as mine development proceeds provides valuable information on the likely behaviour of coal seams ahead of workings. When carried out in conjunction with systematic seam sampling, trends in seam quality, thickness and behaviour can be predicted. This information assists the mining engineer and ensures the most efficient exploitation of resources.

Recording and Interpretation of Data

20. All data should be systematically recorded even if the immediate benefit is not apparent. Past procedures which resulted in being largely a waste of effort because of poor recording or insufficient analysis and testing, must be avoided. Without proper recording, sound interpretation of results is impossible and mistakes will ensue. In contrast, when facts are continuously interpreted, drill sites will be chosen to yield the most information, and drilling in unpromising areas will be avoided. Similarly, systematic interpretation of quality data will permit predictions which may obviate costly mistakes in colliery lay out.

CONCLUSIONS

21. There is an inadequacy of sufficiently detailed data upon which to base a reliable estimate of coal reserves especially in those States—Queensland, New South Wales and Western Australia—in which coal production is an important element in the economy. The Coal Utilisation Research Advisory Committee which also reached this conclusion made the following statement in its final report:—

> " Fig. 2.1 shows the large area in Queensland and New South Wales which contains bituminous coal measures, and it is in these two States in particular that much further exploration is needed. From this it is seen that programmes of modest dimensions would require expenditure in the range of £70,000 to £100,000 per annum in each of these States. The Committee is firmly convinced that detailed knowledge of the country's main coal resources is essential to the proper planning of an extension of coal utilisation and for the application of new processes for its use. In this respect it believes that there is a need for more work on coal exploration, covering such matters as delineation of the reserves, the thickness of seams, depth of coverage, most economical methods of winning the coal, and its physical and chemical characteristics."

22. Too much reliance is placed upon inference which experience has shown is commonly not confirmed by detailed testing. Unless data are collected and recorded in a systematic way and continuously interpreted, planning on a colliery scale, or on a national scale, will be inefficient.

APPENDIX A TO PART I

REFERENCES USED IN " AUSTRALIAN COAL RESOURCES " (APRIL, 1965)

The tables showing reserves and utilisation were compiled using the following references, as detailed:—

TABLE 1

New South Wales

Figures as published in J.C.B. Seventeenth Annual Report 1963-64 (Appendix 3, p. 184) but with Measured and Indicated Reserves of the Southern and South Western Coalfield revised to 775 million tons (J.C.B., unpublished, 9th April, 1965), and figures for Ashford excluded.

Queensland

Measured and Indicated Reserves from " Energy Resources of Queensland and their Use ", Chas. R. Hetherington and Co. Ltd., Dec. 2, 1964 (Figure 2-2, p. 5).

Inferred Reserves from Coal Utilisation Research Advisory Committee Report, March, 1962, Table 2.1, p. 9; Appendix 3, Table 2, p. 133; and Appendix 4, p. 143 and 144. That "very large" conforms to the New South Wales category, i.e. more than 10,000 million tons, is inferred from C.U.R.A.C. Report, Appendix 3, Notes under Table 2; and from the Hetherington Report, p. 4, para. 3-1.

Western Australia

Reserves figures were obtained from the Geological Survey of Western Australia (letter to J.C.B. dated 15th April, 1965). The figures were calculated after the publication of the C.U.R.A.C. Report in March, 1962, but the actual date of calculation was not stated.

South Australia

The reserves figure obtained from the Electricity Trust of South Australia (letter to J.C.B. dated 23rd April, 1965), was calculated in 1958 and revised in 1962 and 1965. The figure represents the economically extractable coal reserves of Leigh Creek coalfield, which would be worked by open cut methods.

Other States

Figures for Victoria and Tasmania were compiled from C.U.R.A.C. Report, Appendix 3, Tables 3 and 6 respectively, pp. 134-135.

TABLE 2

New South Wales

Figures as published in J.C.B. Seventeenth Annual Report 1963-64, Appendix 3, p. 184, but revised for Southern and South Western Coalfield (J.C.B. unpublished, 9th April, 1965).

Queensland

(a) Coking Coal: Figures were obtained by the Joint Coal Board from the Queensland Coal Board on 19th May, 1964, to supply an answer to a question in the House of Representatives; the question was—

" 315: Mr Jones:—To ask the Minister representing the Minister for National Development:

1. Where are the known coking coal deposits in Australia and what type of coking coal is it?
2. What is the estimated tonnage of each deposit?"

(b) Steaming Coal, etc: Figures obtained by subtraction, using Figure 2.2, p. 5 of Hetherington Report. Utilisation mainly from Chapter III "The Coal Resources of Australia"—Power Survey Report No. 3 1955, by the Standards Association of Australia.

Other States

Utilisation of coal in the other States was determined from Chapters IV to VII, "The Coal Resources of Australia"—Power Survey Report No. 3, 1955.

PART II

The Possibility of Significant New Coal Discoveries Outside Known Coal Basins

Introduction

1. The formation of a major coalfield requires certain special conditions. These include the prolific growth and accumulation of suitable plant life in swamps and shallow lakes and, through subsidence, its subsequent burial under sediments which give protection against denudation. Coal seams are thus found in fresh or brackish water sequences within sedimentary basins.

2. In Australia the earliest known plant life is Silurian (see attached time scale—Appendix A). It was not, however, until the Permian Period, that thick and extensive seams were laid down. In Europe and North America, on the other hand, the first great coal age occurred at an earlier date and was named the Carboniferous Period.

3. The degree of coalification, or rank variation, which occurs following burial of the original plant material depends on time, heat and pressure. Except in very special circumstances coals younger than Cretaceous have not achieved rank greater than lignite. It follows that the occurrence of economic coal in Australia is virtually restricted to freshwater beds of Permian to Cretaceous age lying within sedimentary basins. As these basins are generally of large dimensions and as coal measures in turn are usually laterally widespread within them, there is usually surface evidence of the presence of coal. Occasionally the coal measures are completely concealed by younger rocks and are then discovered only when bores or shafts are sunk.

4. The term coal as used hereunder does not include lignite or brown coal. Known coal areas are outlined on the attached map DS141G.

New South Wales

5. With one minor exception all coal currently won in New South Wales is of Permian age. The exception is Nymboida, where a small pocket of Triassic coal supplies a local market. Coal of Jurassic age occurs in the Clarence, Richmond and Tweed districts and in the Dubbo area and, although inferior in quality, was mined in earlier years for local consumption.

6. The largest and most important areas of Permian coal measures lie within the Main Coal Province which extends along the coast from the neighbourhood of Newcastle to the Shoalhaven River, a distance of 160 miles, and has a maximum width of 150 miles from Newcastle to near Dubbo. From Rylstone the boundary extends north to Narrabri. This province includes the Newcastle, Illawarra, South-Western, Western, North-Western, Singleton-Muswellbrook and South Maitland Coalfields. Permian coal measures occur also at Ashford in the north and Coorabin-Oaklands area in the Riverina. The former is a small deposit which currently supplies a local power station; the latter is a concealed deposit of sub-bituminous coal formerly mined for local use.

7. A large part of the State is covered with Recent and Tertiary deposits, suggesting the possibility of concealed coal measures. These can in many places be predicted with reasonable reliability. Geophysical evidence as to the extent and depth of sediments together with bore results indicate that concealed Permian coal measures are probably restricted to extensions of known areas. Mesozoic coal measures on the other hand have been intersected over a wide area in the Western part of the State. Coal seams penetrated, however, have been generally inferior in thickness and quality.

8. The prospects of discovering economic deposits of either Permian or Mesozoic coal in areas away from our known coal basins are poor.

Queensland

9. The coal reserves of Queensland are probably the largest in the Commonwealth and range in age from Permian to Cretaceous and in rank from semi-anthracite to sub-bituminous. Favourable geographical situation has resulted in most of the production coming from the Mesozoic measures, mainly Triassic, adjacent to Brisbane. Jurassic measures although wider in extent are of much less economic importance than the Triassic. Highest rank coals are of Permian age and lowest Jurassic. Cretaceous coals in the eastern part of the State have been raised in rank above the older Jurassic coals as the result of tectonic activity.

10. The main Permian development lies within the Bowen Basin but small isolated deposits also occur in the eastern half of the State as far north as Cooktown. Triassic coal measures have their main occurrence in the Ipswich field, and, north of Brisbane, can be traced discontinuously in a belt almost as far north as the latitude of Bundaberg. Coal measures of Jurassic age occur widely throughout the eastern part of the State, the principal area stretching from the New South Wales border in the south-east corner of Queensland north-westerly for a distance of about 450 miles. Isolated Jurassic basins occur as far north as Pascoe River. The most important development of coal measures of Cretaceous age is found along the east coast at Burrum, Stanwell and Styx River. Cretaceous coal measures are reported also in water bores in the north-western part of the State underlying Cretaceous marine beds.

11. Although Permian coal measures are known to occur at depth west of the Bowen Basin and Cretaceous measures within the Great Artesian basin it is significant that coal is still carried from Collinsville to Mt. Isa for power station purposes, notwithstanding extensive coal prospecting operations by Mt. Isa Mines Ltd. It is very doubtful that these western coal measures will ever achieve much, if any, economic significance.

12. The prospects of discovering economic deposits of Permian or Mesozoic coal outside known coal basins in Queensland are poor.

Western Australia

13. Although Western Australia has the largest development of Permian sedimentation in Australia relatively little is of freshwater origin and all coal seams discovered to date are much inferior to those of Queensland and New South Wales, being at best only sub-bituminous in rank.

14. The occurrence of Permian coals in seams of workable thickness has been recorded in a number of places, including the Fitzroy Basin in the north-west, the Irwin and Greenough Rivers near Geraldton, and in the south-west corner of the State, taking in Collie, Wilga and Flybrook. The only area worked at present is Collie. Prospecting carried out in the other areas has given discouraging results.

15. Oil wells sunk in Western Australia have encountered coal seams from time to time in both Permian and Mesozoic strata but none are known to have economic significance.

16. It appears unlikely that economic coal deposits will be discovered in Western Australia away from the known areas.

South Australia

17. Coal measures in South Australia are of Mesozoic age, the oldest and most important coal deposit being at Leigh Creek, where sub-bituminous coal of Triassic age is currently mined. Higher rank coal does occur within the State, having been encountered in a bore at Robe. This bore penetrated thin seams at depths ranging from 2,800 to 3,600 feet, believed to be part of the Jurassic coal measures which extend from south-west Victoria into South Australia. These measures do not outcrop and are overlain by heavily water-charged Cainozoic sediments. Cretaceous coal, mainly sub-bituminous, is known to occur in a number of places and has been reported from bores sunk in the Great Artesian Basin.

18. Whilst it may be expected that seams of Mesozoic age will be encountered from time to time in bores penetrating the Cainozoic cover of the Murray and Great Artesian Basins, it is considered most unlikely that economic deposits of coal will be found.

19. The prospects of discovering economic deposits of coal outside known areas in South Australia are very poor.

Victoria

20. Coal deposits in the State belong to the Jurassic Period. Rocks of this age are widespread over Southern Victoria but coal seams are poorly developed. There is no evidence of Permian coal deposition in Victoria, although the possibility exists that the coal measures of the Coorabin field in New South Wales may extend south across the Murray River.

21. Coal deposits in the State are found in three main areas, (a) South Gippsland, (b) Otway-Bellarine area, and (c) Wannon River area in the south-west. South Gippsland alone is known to possess seams of economic thickness from which a small production of coal is currently obtained.

22. It is unlikely that economic coal deposits will be found outside the known areas of South Gippsland, other than a possible southerly extension of the Coorabin field.

Tasmania

23. Black coal deposits occur as a number of scattered and isolated pockets, chiefly in the north-east, east and south-east of the State. The coals are of both Permian and Triassic age, the latter being the more important by far.

24. Permian coal seams range up to 2 ft in thickness and have no economic significance at present. At Fingal the only relatively large producing mine in the State works an 8 ft thick seam of Triassic coal whose thickness is known to deteriorate a short distance south of the present workings.

25. Owing to the discontinuity of the coal measures, together with the masking effect of overlying dolerite, which blankets a large part of eastern and central Tasmania, it is not possible at present to establish whether the coal measures were laid down in one large basin or in a series of lakes. It is possible that considerable coal reserves occur beneath dolerite sills; however, with a sill thickness commonly of 1,500 ft it is not likely that large reserves will be found within economic depths.

NORTHERN TERRITORY

26. The Northern Territory consists largely of rocks of pre-Permian age and unlikely to contain economic coal deposits. Permian freshwater beds are known to occur in the Bonaparte Gulf Basin in a narrow coastal belt and have been tested by at least six bores, none of which encountered other than a few thin lenses of coal.

27. It is improbable that coal deposits of economic significance will be found anywhere in the Northern Territory.

CONCLUSION

28. The prospects of finding workable coal seams outside known coal basins in Australia are not good; moreover, it is unlikely that coal found in such areas would have much economic importance. Hence future drilling programmes should be concentrated in known basins, particularly in New South Wales and Queensland.

J. B. ROBINSON,
Chief Geologist.

oint Coal Board,
Sydney, May 1965.

APPENDIX A TO PART II

GEOLOGICAL TIME SCALE

Cainozoic	Recent, Tertiary
Mesozoic	Cretaceous, Jurassic, Triassic
Palaeozoic	Permian, Carboniferous, Devonian, Silurian, Ordovician, Cambrian
Pre Cambrian	

COMMENT BY SIR HAROLD RAGGATT

60 Arthur Circle,
Forrest.
CANBERRA. A.C.T.
20th April, 1965.

Dear Mr Hartnell,

COAL RESOURCES

I have examined Mr Robinson's report, discussed it fully with him and agree with his conclusions that—

the chances of finding significant economic deposits of coal outside known prospective areas are poor;

information about our coal reserves is inadequate and, in N.S.W. and Queensland particularly, to provide the additional information required, much more drilling to modern standards is required accompanied by systematic collection and recording of data on seam characteristics and quality;

in the interests of national conservation of coal resources for domestic use and for export it is becoming urgent that the work of proving reserves should be increased significantly.

Yours sincerely,
H. G. RAGGATT.

B. W. HARTNELL, Esq.,
Chairman,
Joint Coal Board,
G.P.O. Box 3842,
SYDNEY. N.S.W.

NEW SOUTH WALES COAL RESERVES—30TH JUNE, 1966

The results of the Joint Coal Board's requisition of July, 1965, to the colliery companies regarding estimates of reserves within their holdings, show that the Measured and Indicated coal reserves within each coalfield may vary considerably from the figures quoted by the Board in previous years. The Board has therefore decided not to publish coalfield reserves figures until further progress has been made with its present independent study of reserves both within and beyond colliery holdings.

Details of coal reserves within colliery holdings *as estimated by the colliery companies* are given in the table below. These are totals as at 30th June, 1966 and include figures from 92 of the 114 collieries from which information was requested. These figures have been tabulated by the Board in accordance with categories stipulated in the Code for Calculating and Reporting Coal Reserves in New South Wales prepared by the Standing Committee on Coalfield Geology.

Table 1—In Situ Reserves—millions of tons

Coalfield	Coking			Non-Coking			Total		
	M + I	A	M + I + A	M + I	A	M + I + A	M + I	A	M + I + A
East Maitland ..	57·9	42·3	100·2	..	..	..	57·9	42·3	100·2
Greta-South Maitland	..	..	..	480·8	23·2	504·0	480·8	23·2	504·0
Lithgow	..	..	..	150·8	2·2	153·0	150·8	2·2	153·0
Newcastle	695·3	344·0	1,039·3	616·7	532·1	1,148·8	1,312·0	876·1	2,188·1
Singleton-Muswellbrook	263·4	26·8	290·2	48·5	14·1	62·6	311·9	40·9	352·8
Southern and South Western	1,011·7	867·2	1,878·9	14·5	35·9	50·4	1,026·2	903·1	1,929·3
Miscellaneous ..	..	..	..	37·4	..	37·4	37·4	..	37·4
Total	2,028·3	1,280·3	3,308·6	1,348·7	607·5	1,956·2	3,377·0	1,887·8	5,264·8

Table 2—Recoverable Reserves—millions of tons

Coalfield	Coking Coal			Non-Coking			Total		
	M + I	A	M + I + A	M + I	A	M + I + A	M + I	A	M + I + A
East Maitland ..	51·3	28·8	80·1	..	..	..	51·3	28·8	80·1
Greta-South Maitland	..	..	..	271·4	..	271·4	271·4	..	271·4
Lithgow	..	..	..	78·1	..	78·1	78·1	..	78·1
Newcastle	355·7	184·0	539·7	225·4	270·3	495·7	581·1	454·3	1,035·4
Singleton-Muswellbrook	158·3	17·4	175·7	20·5	12·8	33·3	178·8	30·2	209·0
Southern and South Western	556·3	552·6	1,108·9	2·1	33·6	35·7	558·4	586·2	1,144·6
Miscellaneous ..	..	..	..	24·7	..	24·7	24·7	..	24·7
Total	1,121·6	782·8	1,904·4	622·2	316·7	938·9	1,743·8	1,099·5	2,843·3

M = Measured I = Indicated A = Assumed

APPENDIX 4

SUGGESTED CODE FOR

CALCULATING AND REPORTING COAL RESERVES IN NEW SOUTH WALES

1. The following rules and definitions, which are now being followed generally by many engaged in the preparation of coal reserve estimates, are designed to combine the best beatures of the procedures used in preparing older published estimates of coal reserves, with modifications based on the recent experience of a number of geologists and engineers. They are intended to produce a reasonable uniformity of thinking and procedure on the part of coal geologists, so that coal reserve estimates prepared for different areas can be combined in Parish, County and State totals. Obviously, all of the generalised statements contained herein do not apply rigidly to all coal-bearing areas, and one should select, with minor modifications, if necessary, procedures that best apply to his local areas. In particular it is desirable that distances from outcrop, bores and underground workings as stated herein be not exceeded. On the contrary it is to be expected that in many instances the estimator will find it desirable to reduce the values stated here.

RANK OF COAL

2. Because Reserves calculations are intended to be applied to black coals as one group only, there will be no account taken of varying ranks of coal. Specifically, it is not intended that any computations applying this code be made in respect of lignites or brown coals within the State of New South Wales.

OVERBURDEN

3. Reserve data shall be reported according to the amount of overburden on the coal. Taking account of legislative restrictions and the simpler open cut requirements, the categories are :

a) 0-50 feet ... ... SPECIAL

b) 50 feet to 150 feet ... ... SPECIAL

c) less than 2,000 feet but including (a) & (b) where calculated

d) 2,000 feet to 3,000 feet.

4. Categories (a) & (b) are to be regarded as SPECIAL and will only be used for areas being examined with a view to open cut operations.

5. Where open cut requirements cannot be fitted to the above figures, reserves of open cut coal shall be calculated as other separate categories. Limiting amounts of overburden or ratios of thickness of overburden to thickness of coal shall be chosen to conform with local experience and conditions at the time of computation.

THICKNESS RANGE

6. In all reports of coal reserves, the sub-totals shall be prepared to show the reserves contained in beds falling as near as practicable within the following thickness ranges :

a) 2 feet to 3 feet (Optional but not to be used in summary totals).

b) 3 feet to 4 feet

c) 4 feet to 6 feet

d) 6 feet to 12 feet

e) more than 12 feet

7. In respect of assumed reserves and inferred reserves calculations shall be made only for the thickness ranges :

a) 3 feet to 6 feet

b) more than 6 feet

CLASSES OF RESERVES

8. On the basis of the relative reliability of the data on which the calculations are based, coal reserves shall be reported in any or all of the seven categories :

a) Potential Reserves

b) Measured "

c) Indicated "

d) Recoverable "

e) Assumed "

f) Inferred "

g) Resources

9. Potential Reserves : For each bed or part of a bed within a prescribed thickness range and a prescribed area contemplated as or actually constituting a colliery holding, the potential reserves prior to mining shall be calculated first and reported separately. Long tons of 2,240 lb. shall be used in reporting and this shall be stated in every table. There shall be no deductions for losses in mining, barriers, etc. i.e. all coal shall be included.

a) Average thickness. The use of isopach lines is the most effective way to evaluate the thickness of a coal seam. Generally, however, the data are insufficient for this purpose, and average figures must be used. When this is done the averages must be weighted according to the approximate area of seam represented by each observation. If the points of observation are not evenly spaced, the weighting can be accomplished most easily by assigning intermediate values for the thickness at places where data are needed, to fill out a system of evenly spaced points. If this procedure is followed to obtain the weighted average thickness along the outcrop of a persistent seam, the two end points must also be included in the average. Where the points of observation are fairly evenly spaced, as in an exploratory or developmental drilling programme, a simple average is sufficient. Seams and parts of seams made up of alternating thin layers of coal and bands shall be omitted if the bands make up more than 25% of the total thickness or if the overall ash content exceeds 40%. Layers of coal of less than the minimum thickness stated above (See para. 6) which lie above or below thick bands and which would normally be left in mining, shall also be omitted. It is desirable to state the average thickness adopted.

b) Weight of coal. In the absence of other precise data it may be assumed that one acre foot will contain 1,650 long tons. This is based on the assumption of a specific gravity of approximately 1.37.

10. Measured Reserves : Measured coal is coal for which tonnage is computed from dimensions revealed in outcrops, trenches, mineworkings and drill holes. The points of observation and measurements are so closely spaced and the thickness and extent of the coal is so well defined that the computed tonnage is judged to be accurate within 20% or less of the true tonnage. The limits of accuracy of the estimates should be stated.

11. Although the spacing of the points of observation necessary to demonstrate continuity of coal will vary in different regions according to the habit of the coal seams the points of observation are, in general, of the order one half mile apart. The outer limit of a block of measured coal therefore shall be of the order of one quarter mile from the last point of positive information (i.e. roughly one half the distance between points of observation).

12. Where no data are available other than measurements in mine workings but where the continuity of the seam suggests the presence of coal at great distances in from the workings a line drawn approximately one half mile in from the measured points in the workings shall be used to mark the limit under cover of a block of coal that can also be classed as Measured.

13. Indicated Reserves : Indicated coal is coal for which tonnage is computed partly from specific measurements, and partly from projection of visible data for a reasonable distance on geologic evidence. In general, the points of observation are of the order of one mile apart. Indicated reserves shall exclude contained measured coal.

14. Where there are no data available other than measurements in mine workings but where the continuity of the seam suggests the presence of coal at great distances in from the workings two lines drawn parallel to the line of measured points in the workings, one drawn one half mile in from the measured points in the workings and one drawn one mile in from the workings, define a block of coal that may be classed as Indicated.

15. Recoverable Reserves : Recoverable coal is that coal which will be won by mining.

16. Desirably it should only take account of measured coal but, in N.S.W. for some few years to come, it must be accepted that recoverable coal will be calculated on the basis of Measured and Indicated Reserves and accordingly this part of the code treats with Measured and Indicated Reserves.

17. Recoverable coal shall be calculated by :

a) Taking Measured and Indicated coal

b) Subtracting that coal for which there is a prohibition in working such as:

i) Barriers against roads, railways, lease boundaries, old workings, etc.

ii) Working under stored water, rivers, swamps, tidal waters, etc.

iii) Working under roads, easements and other proclaimed reserves

iv) Other restrictions imposed by lease conditions or other statutory means.

Note : When considering the categories listed under (b) attention should be given to prohibitions which may later apply because of surface developments or other reasons not previously stated. The assessor should state what allowance is made for such circumstances.

c) Applying a mining recovery factor determined for the geologist by a mining engineer. In the absence of any other advice from a mining engineer at the time of computing reserves, the figure of 100 tons per acre inch for extraction shall be adopted. For all computations the percentage extraction must be stated on the final record.

18. Assumed Reserves : Assumed coal is that coal remaining in a colliery holding outside the range of indicated coal.

19. Inferred Reserves : Inferred coal is coal for which quantitative estimates are based largely on broad knowledge of the geologic character of the bed or region and for which there are few, if any, measurements. The estimates are based on an assumed continuity for which there is geologic evidence. In general, inferred coal is coal lying within areas more than one mile from points of established observation in workings or half a mile from any other point of observation.

20. A quantitative value will not be allocated to inferred reserves other than to indicate its value within the following range :

a) very large - in excess of 10,000,000,000 tons

b) large - 100,000,000 tons to 10,000,000,000 tons

c) small - 20,000,000 tons to 100,000,000 tons

d) very small - less than 20,000,000 tons

21. The term inferred coal will commonly relate only to coal fields, coal districts and coal provinces.

22. Resources : Resources is the total of Measured and Indicated Reserves expressed as a figure value in tons plus Inferred Reserves described as in para. 19.

RESERVES IN INDIVIDUAL BEDS

23. For each individual seam a map shall be prepared showing the outcrop of the seam, the thickness of the coal at each measured section, the areas included in estimates of measured and indicated reserves, the areas included in each thickness category and the 2,000 and 3,000 feet overburden lines (plus, where appropriate the 50 and 150 feet overburden lines). In the tables and text, reserves shall be reported for each seam and all assumptions about the average thickness and extent shall be given so that the work can be checked for arithmetic accuracy and so that adjustments can be made in the future as more definite information is acquired.

PROPERTIES OF COAL

24. Where known properties of a seam may influence its mining development or subsequent use, these properties shall be shown on the maps.

25. Wherever practicable, coals should be classified according to their International Classification code numbers, and these might appropriately be shown as coloured areas on regional maps.

26. Volatile Matter, Ash and Sulphur should be recorded and other properties such as calorific value, coking, and caking properties may each be delineated into ranges and recorded separately at the discretion of the estimator.

27. In the absence of any other special requirement, intervals for the lines delineating properties should be as follows :

Isovol	3%
Isoash	2%
Isosulph	0.5% up to 2%. Areas containing more than 2% should be indicated.

28. The delineation and separate recording of ranges of properties shall apply to the Measured and Indicated Reserves categories and, only if practicable, to the Assumed Reserves categories. Any lines indicating properties that have a high degree of estimation are to be shown as dotted.

DATE OF RESERVE ESTIMATES

29. All estimates of reserves shall carry a notation of the date on which the reserves were calculated. In the case of areas being worked by mining or which have been worked by mining it will be necessary to state also the date up to which the mining plans were charted.

MAPS

30. Maps to be used should be of Parish type and, depending on the published scale, should be 20 chains or 40 chains to one inch. Within Parishes calculations may be taken by individual Portions or by larger areas. The use of a colliery holding as an area for one calculation is not in any sense prohibited but, if adopted, care must be taken to guard against the possibility that between the time of original calculation and the time of an ultimate usage the boundaries of a colliery holding may have changed.

Standing Committee on
Coalfield Geology