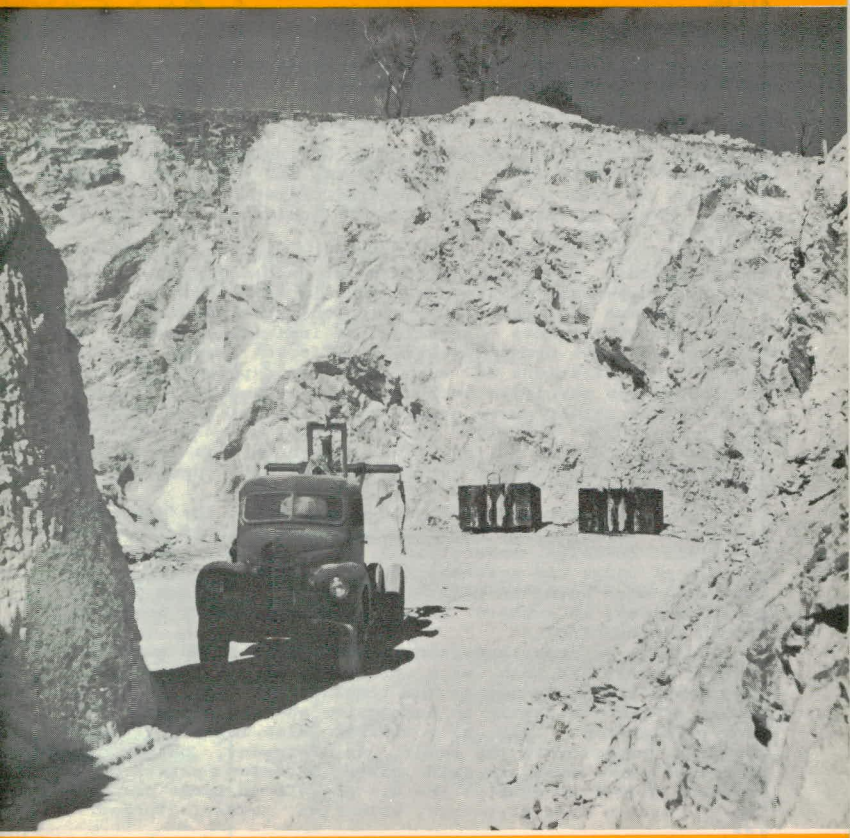
TALC
in
South Australia

S.A. Department of Mines and Geological Survey



MINERAL INFORMATION SERIES

Talc is one of the most widely known and used mineral substances. In the form of various talcum powders it is probably familiar to most people, and in one form or another its special characteristics make it useful in a number of different industries.

Talc is chemically a hydrous silicate of magnesium, containing 63.5 percent silica (SiO_2) 31.7 percent magnesia MgO and 4.8 percent water. Commercial deposits of talc usually contain a proportion of impurities, such as quartz, calcite, dolomite, magnesite, tremolite and iron oxide.

The mineral is usually found in soft, foliated or compact massive aggregates; white, grey or green in colour. It is soft (Hardness 1) and can usually be scratched with the finger nail. The lustre is greasy to pearly; the cleavage micaceous in crystalline varieties. The fracture is irregular; the feel characteristically greasy. It is transparent to opaque. The specific gravity is 2.7 to 2.8. Many of its uses depend upon its chemical stability and inertness.

The commercial variety of talc is usually the massive type, either foliated or granular.

Soapstone is a rock consisting principally of talc.

Steatite is high grade massive talc.

French chalk is a soft compact variety which will mark cloth.

Asbestine is a trade name sometimes applied to fibrous talc.

Lava is a trade name applied to baked talc used for gas burner tips, and electrical insulation.

UTILISATION

Talc is marketed principally as a finely ground powder, though for certain uses, coarser sizes are required. Massive talc is used as metal workers crayon and as tailors chalk. There is very little use in Australia for talc in the massive unground form.

Crude talc is produced at the talc mines at Mt. Fitton and Gumeracha, the grinding to powder and marketing being done by independent milling companies in Adelaide.

There are no generally accepted specifications for talc, the requirements differing for individual uses. The milling companies produce several different grades and can supply specifications of each grade to a potential user. The properties specified include chemical analysis (commercial talc is rarely pure), screen analysis, moisture content, colour, specific gravity, physical form and applications for which it is best suited. The ground talc is packed in multi-walled paper bags, 40 to the ton, for despatch to users.

There are over sixty known uses for talc, the principal ones on a world scale being in paints, rubber, roofing materials, ceramics, insecticides, paper and cosmetics. The pattern of usage is somewhat different in Australia, the principal uses being in paint manufacture, in talcum powders and cosmetics, in rubbers (both in dusting rubber products, and in compounding).

Talc is an important constituent in a large number of paints, being used both as a filler and as a pigment. Its value as a filler is due to the tendency of the flat flakey grains of talc to remain in suspension and prevent the settling of pigments. Talc as a filler also imparts greater covering capacity to the paint. As a pigment, pure white varieties are used in cold water interior paints. Its chemical stability enables the use of talc in large proportion in certain special paints, with fire resisting properties.

The cosmetic industry is a very large consumer of talc in Australia. Only the highest grade white talcs are used for the manufacture of a wide variety of goods, principally talcum powders, soaps, creams, lotions, lipsticks and many other toilet and pharmaceutical preparations. The major

Hoist at side of open cut, Mt. Fitton.

Unloading crude talc, Rosewater.

supplies of talc to the Australian cosmetic industry are obtained from the Mt. Fitton deposits, in the northern Flinders Ranges.

Powdered talc is used extensively in the rubber industry for the dusting of moulds and finished products, its value lying in its high slip and lubricating power. Good second grade off-white talc is generally acceptable to these consumers, provided it is free from grit.

Coarse low grade talc is used in the roofing industry for the manufacture of asphalt roofing paper, being used both as a filler and as a surfacing agent. The talc imparts both weather resisting and fire proofing qualities to the paper.

In Ceramics, talc is used principally in wall tiles, dinner ware and electrical porcelain. While wall tiles incorporating talc are made in Australia, most electrical procelain is now imported, in part from Japan.

Talc powder forms the basis of a wide variety of insecticides, its use being greatly increased by the large scale development of DDT dusts, in which talc is an inert diluent or carrier.

Some of the other uses for which ground talc is adopted are: as a filler in soap; in foundry facings and wire insul-

ating compounds; as a filler in linoleum and oil cloth; as a filler in cotton textiles; as a cleaning and polishing agent for rice, peas, coffee beans, peanuts etc.; in making coloured crayons; in acid proof flooring and many others.

PRODUCTION

The annual production of talc in South Australia was 10,277 tons in 1968 and a total of 212,637 tons have been produced since the inception of mining in about 1900.

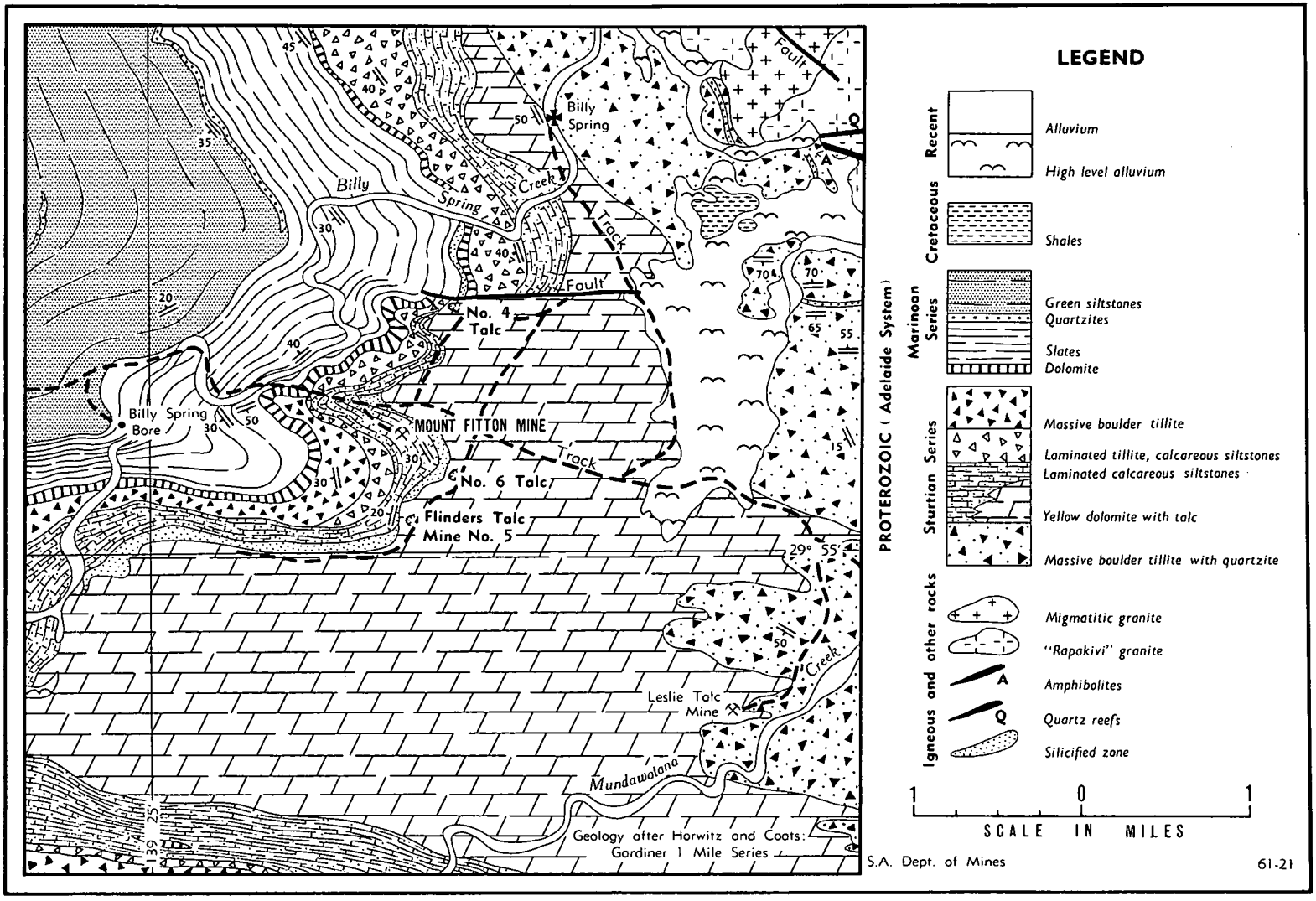
For comparison, the present production for Australia is 21,105 tons in 1966. World production of talc was 4,040,000 tons in 1966, of which 895,045 tons were mined in the United States, 1,186,935 tons in Japan and 228,254 tons in France.

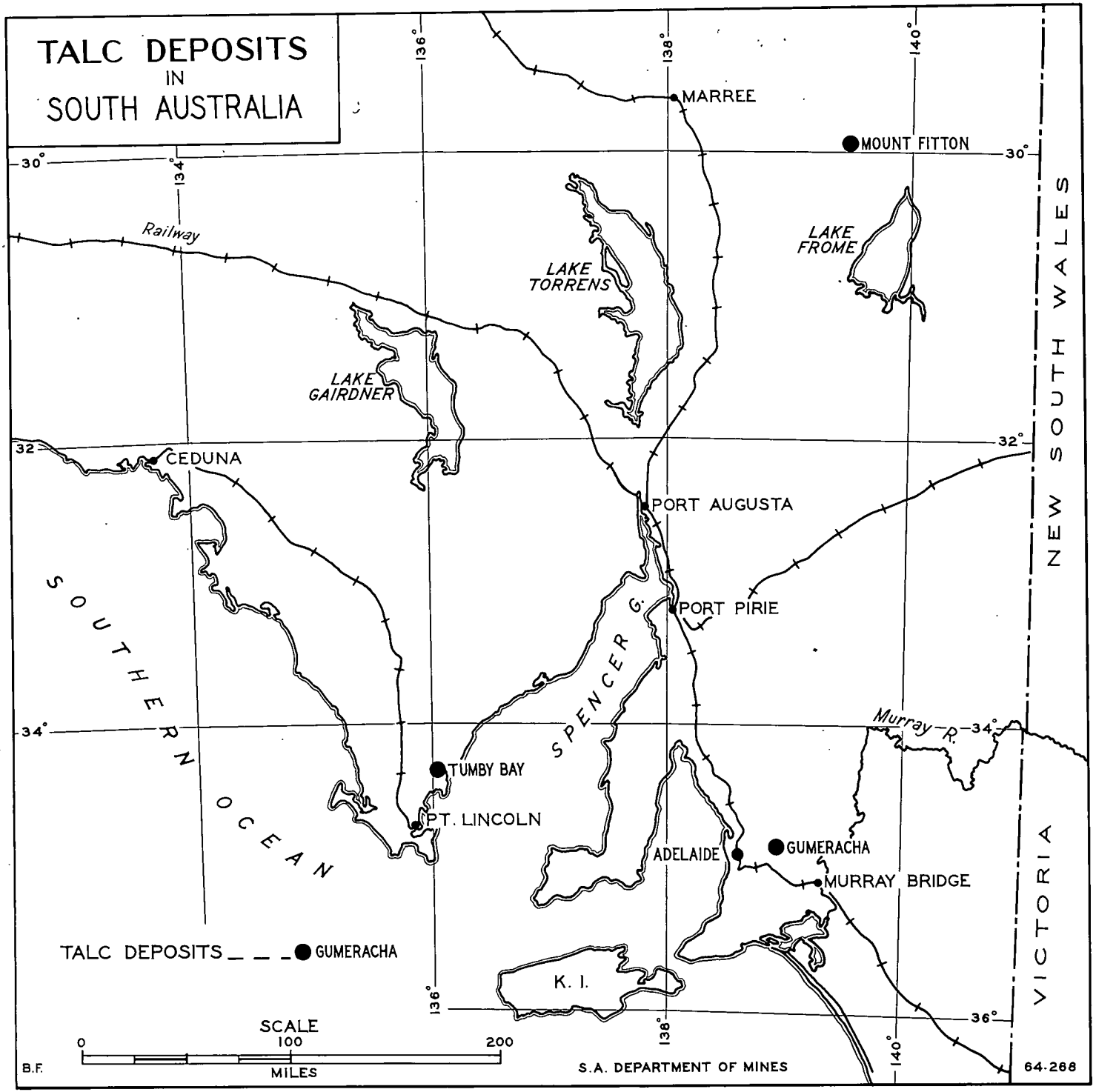
OCCURRENCE

Most deposits of commercial talc are alterations of high-magnesium rocks, principally dolomite, dolomitic limestone and ultrabasic igneous rocks. The principal deposits in South Australia are at Mount Fitton, in the northern Flinders Ranges; at Gumeracha; and near Tumby Bay.

The Mount Fitton talc deposits lie in a large formation of tremolite marble interbedded with fluvioglacials and tillites of the Adelaide System (Upper Precambrian). The marble beds have been deformed by folding and minor faulting, and in part altered to talc by the actions of hot solutions at a time when all the rocks were deeply buried beneath the earth's crust. Erosion involving the removal of the overlying rocks has exposed the talc bodies in their present positions. There are a number of talc bodies within the marble beds, most of which are located near the upper or lower contacts with tillites and slates. Reserves of talc

GEOLOGICAL MAP OF THE MOUNT FITTON MINE AREA




TALC DEPOSITS
IN
SOUTH AUSTRALIA
MARREE
MOUNT FITTON
30°
134°
136°
138°
140°
Railway
LAKE TORRENS
LAKE FROME
LAKE GAIRDNER
32°
CEDUNA
PORT AUGUSTA
PORT PIRIE
NEW SOUTH WALES
SOUTHERN OCEAN
SPENCER G.
34°
Murray R.
TUMBY BAY
PT. LINCOLN
ADELAIDE
GUMERACHA
MURRAY BRIDGE
VICTORIA
K. I.
36°
TALC DEPOSITS
GUMERACHA
SCALE
0
100
200
MILES
B.F.
S.A. DEPARTMENT OF MINES
64-268

in the deposits now being worked by Industrial Rock Mines Pty. Ltd. are large, and should continue to supply the Australian requirements of high grade talc for many years.

The Gumeracha talc deposits are located principally in an area of about 12 square miles in the Hundred of Talunga, 25 miles from Adelaide. The rocks of the district comprise chiefly schists with thin bands of interbedded quartzite of the Precambrian Adelaide System. There are numerous pegmatite lenses scattered through the district. The talc deposits of commercial value are parts of altered schists and quartzite which have been completely replaced by talc. The talc bodies are very irregular in size and shape and include large boulders of albite felspar and quartzite, which make systematic mining difficult. Most of the production comes from underground workings. Though the deposits do not include high grade talc comparable with that at Mount Fitton, it is eminently suitable for a number of industrial applications.

The Tumby Bay deposits are associated with a bed of dolomite among rocks which are mostly mica schists. The talc, unlike that of the Mount Fitton and Gumeracha deposits, is very fine and powdery. The deposits are irregular, and have been worked by highly selective mining. The talc bodies are not large, their extent is difficult to establish with certainty, but reserves are evidently limited. The deposits have not been worked for several years.

PRINCIPAL TALC PRODUCERS IN S.A.

Industrial Rock Mines Pty. Ltd., Mount Fitton.
J. Dunstan and Son (W.A.) Ltd., Gumeracha.
Torrens Mining Co. Ltd., Gumeracha.

The market price of talc depends upon quality and ranges from $20 to $80 per ton when milled.

For full information, the reader is referred to Geological Survey Bulletin No. 26 "Talc Deposits in South Australia."

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Photos by courtesy of S. N. Rodda and Co. (S.A.) Pty. Ltd.

Address

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S.A. Department of Mines.

H. J. WALL GOVERNMENT PHOTOLITHOGRAPHER, ADELAIDE

S.A. Department of Mines and Geological Survey

TALC
IN SOUTH AUSTRALIA

MINERAL INFORMATION SERIES NO. 5

T A L C.

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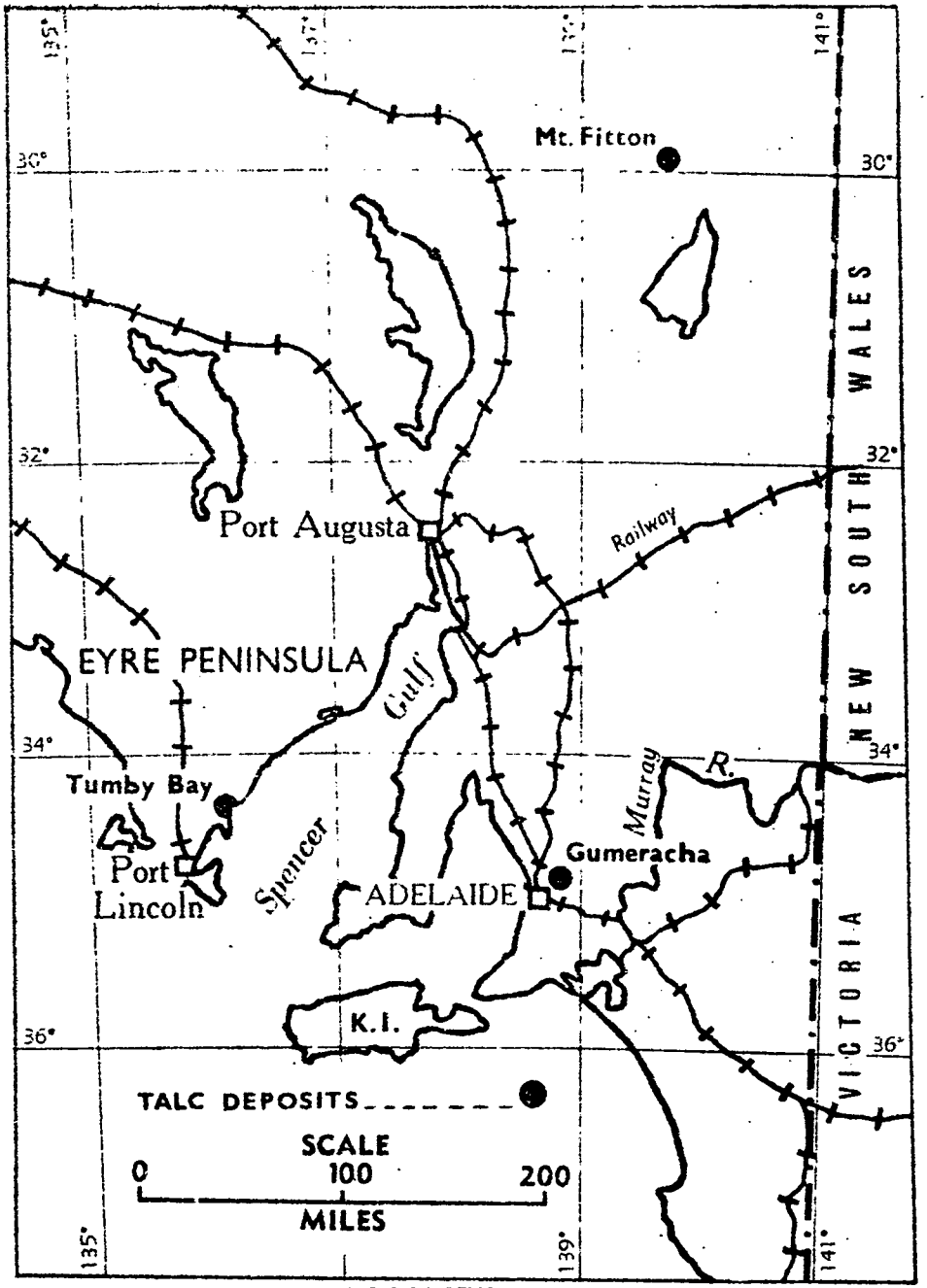
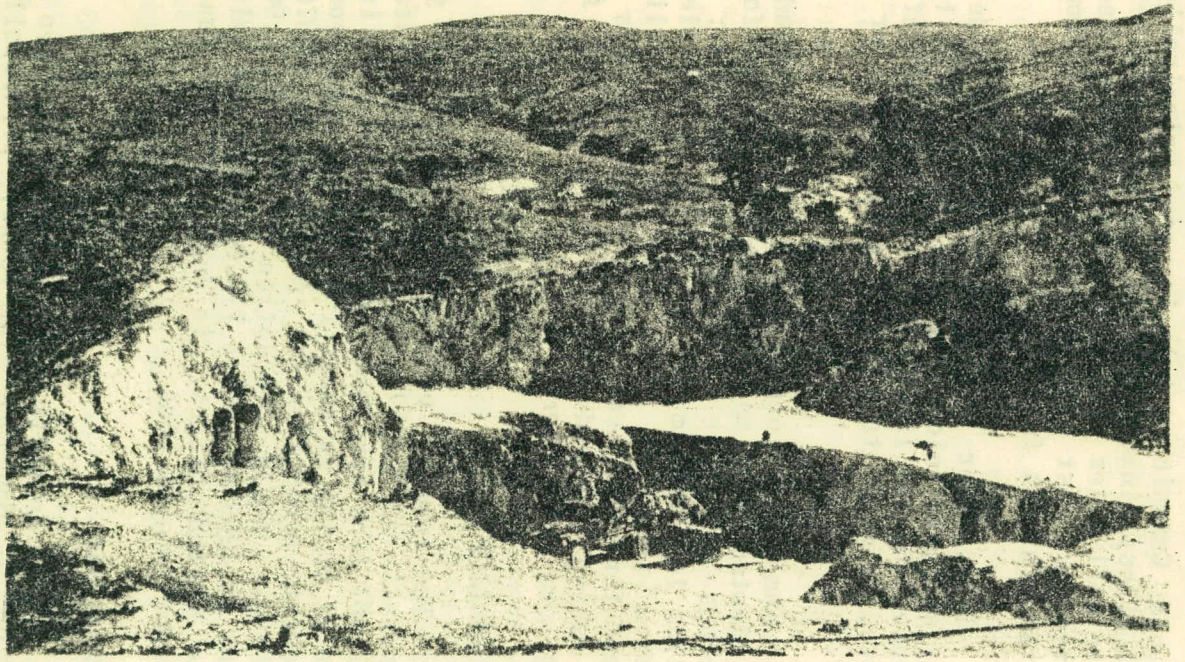


LOCALITY MAP



Mount Fitton Talc Mine — Open-cut Workings

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Some of the other uses for which ground talc is adopted are: as a filler in soap; in foundry facings and wire insulating compounds; as a filler in linoleum and oil cloth; as a filler in cotton textiles; as a cleaning and polishing agent for rice, peas, coffee beans, peanuts etc.; in making coloured crayons; in acid proof flooring; and many others.

Production

The annual production of talc in South Australia was 8,939 tons in 1960, and a total of 147,807 tons have been produced since the inception of mining in about 1900. For comparison, the present production for Australia is 15,670 tons (1960). World production of talc was 1,900,000 tons in 1959 of which 710,000 tons was mined in the United States, in Japan 478,000 tons and France 145,000 tons.

Occurrence

Most deposits of commercial talc are alterations of high-magnesium rocks, principally dolomite, dolomitic limestone and ultrabasic igneous rocks. The principal deposits in South Australia

are at Mount Fitton, in the northern Flinders Ranges; at Gumeracha; and near Tumby Bay.

The Mount Fitton talc deposits lie in a large formation of tremolite marble interbedded with fluvioglacials and tillites of the Adelaide System (Upper Precambrian). The marble beds have been deformed by folding and minor faulting, and in part altered to talc by the actions of hot solutions at a time when all the rocks were deeply buried beneath the earth's crust. Erosion involving the removal of the overlying rocks has exposed the talc bodies in their present positions. There are a number of talc bodies within the marble beds, most of which are located near the upper or lower contacts with tillites and slates. Reserves of talc in the deposits now being worked by John Dunstan & Son (W.A.) Ltd. are large, and should continue to supply the Australian requirements of high grade talc for many years.

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Market price of talc, depends upon quality and ranges from £3 to £19 per ton in the crude form and from £10 to £30 per ton when milled.

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(Reprinted March 1962).


GEOLOGICAL SURVEY
SOUTH AUSTRALIA

South Australian Department of Mines and Geological Survey

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Production

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6/8/59