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(A. K. Denmead, M.Sc., Chief Government Geologist)

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QUEENSLAND BUILDING AND MONUMENTAL STONES

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QUEENSLAND BUILDING AND MONUMENTAL STONES

SUMMARY REPORT.

Compiled by K. W. WOLFF, B.Sc., Assistant Geologist.

INTRODUCTION.

THIS report summarises all the information, available at this department, on the main Queensland deposits of rocks, suitable for building and monumental purposes. Building masons and quarry masters were consulted and they supplied much useful data.

Following on the wide use of stone, in the construction of many of the buildings erected in the late years of the last century and the early part of this century, Ball (1905) and Richards (1918) presented detailed reports on the Queensland building stones.

The more important factors to be considered in the development of stone deposits are accessibility, colour, texture, appearance, hardness, strength, workability and durability of the stone, and also the ease of quarrying.

Large quantities of high quality building and monumental stone are readily available in Queensland. As regards appearance, colour, working properties and durability, the majority of our stones must be ranked first class and equal or even superior in quality to much of the imported material.

The Queensland stones may be classified in three main groups which can be further subdivided—

I. Igneous.

(1) Plutonic.

(*a*) Granite and associated rocks including grano-diorite, quartz-diorite, and diorite.

(2) Volcanic

(*a*) Rhyolite and trachyte.

(*b*) Basalt.

(*c*) Tuff or "porphyry."

II. Sedimentary.

(*a*) Sandstone.

III. Metamorphic.

(*a*) Marble

(*b*) Serpentinite.

QUEENSLAND DEPOSITS.

I. Igneous.

(1) PLUTONIC.

(*a*) GRANITE, &c.

In this report the term granite is used in its wider usage to cover all rocks of granitic texture.

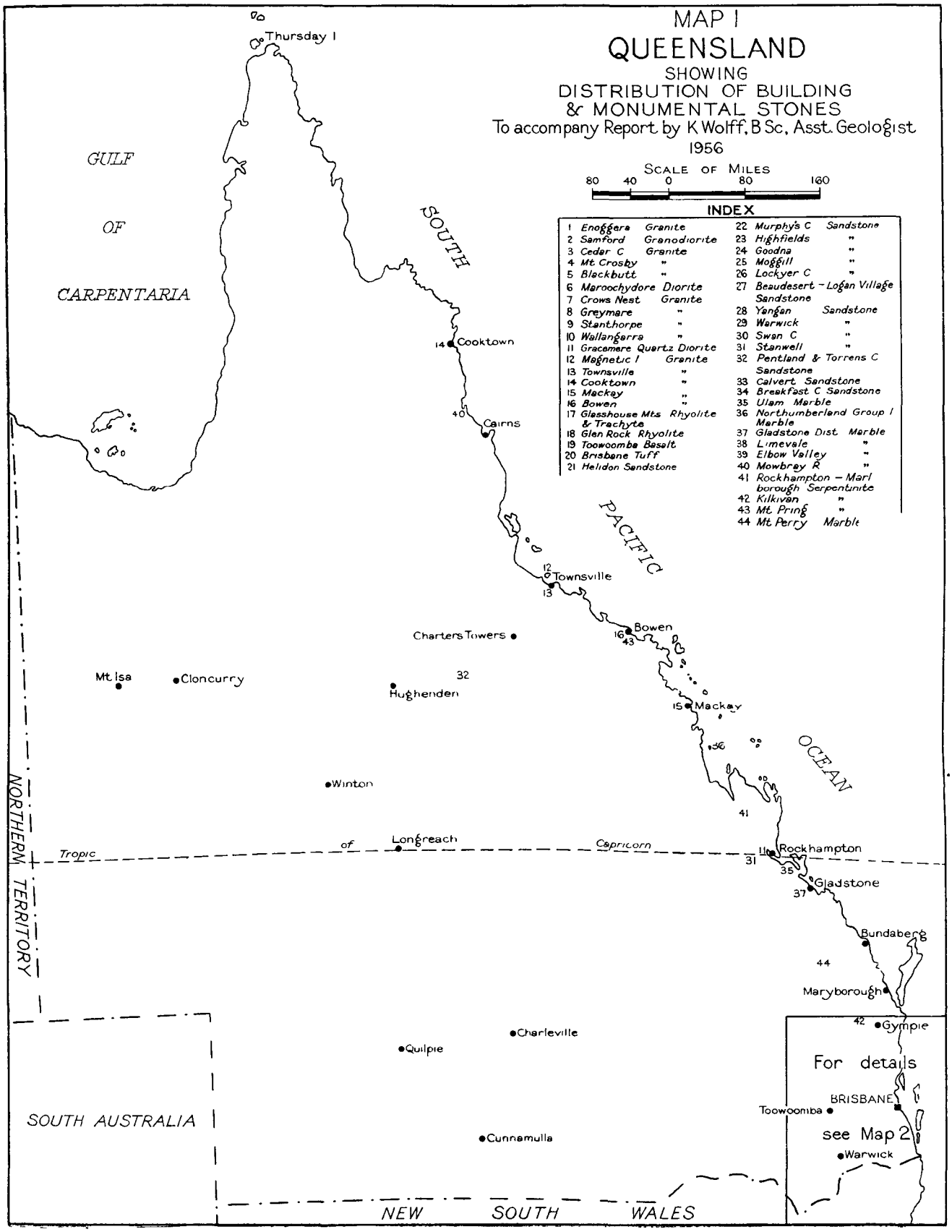
Granites are well distributed in Queensland particularly as regards proximity to the main coastal cities and towns. They range in colour from pink to various shades of grey, and in texture from fine even-grained to coarse prophyritic.

The following are the principal known sources.

(i.) *Enoggera Granite.*—Occurring a few miles to the west of Brisbane, the Enoggera granite mass is extremely variable in the minerals present, their relative proportions, grain size and fabric. The pink phase is predominant over the grey and the major part of the granite is uniform flesh coloured and composed of plagioclase, orthoclase, quartz, biotite, hornblende and chlorite. Pyrite was present in some of the early stone taken from this area and due to its unsightly weathering products gave the stone an unfavourable reputation. After this staining caused by the weathering of pyrite was noticed, only stone free from pyrite was worked, and gave excellent results. Ample supplies of pyrite-free material are available.

The Enoggera granite is tough, takes a very good polish, resists abrasion and weathers well. It has a high resistance to crushing, a specific gravity of 2·59 and a weight of 162 pounds per cubic foot.

Considerable use has been made of this granite in building and monumental work. Enoggera granite was used in the following Brisbane buildings:—Executive Building, Central Technical College, Government Printing Office, and in the bed blocks of Victoria Bridge and base of Queen Victoria's statue


MAP 1
QUEENSLAND
SHOWING
DISTRIBUTION OF BUILDING
& MONUMENTAL STONES
To accompany Report by K Wolff, B Sc, Asst. Geologist
1956
SCALE OF MILES
80 40 0 80 160
INDEX
1 Enoggera Granite
2 Samford Granodiorite
3 Cedar C Granite
4 Mt Crosby "
5 Blackbutt "
6 Maroochydore Diorite
7 Crows Nest Granite
8 Greymare "
9 Stanthorpe "
10 Wallangarra "
11 Gracemere Quartz Diorite
12 Magnetic I Granite
13 Townsville "
14 Cooktown "
15 Mackay "
16 Bowen "
17 Glasshouse Mts Rhyolite & Trachyte
18 Glen Rock Rhyolite
19 Toowoomba Basalt
20 Brisbane Tuff
21 Helidon Sandstone
22 Murphy's C Sandstone
23 Highfields "
24 Goodna "
25 Moggill "
26 Lockyer C "
27 Beaudesert - Logan Village Sandstone
28 Yangan Sandstone
29 Warwick "
30 Swan C "
31 Stanwell "
32 Pentland & Torrens C Sandstone
33 Calvert Sandstone
34 Breakfast C Sandstone
35 Ulam Marble
36 Northumberland Group I Marble
37 Gladstone Dist Marble
38 Limevale "
39 Elbow Valley "
40 Mowbrey R "
41 Rockhampton - Marlborough Serpentinite
42 Kilkivan "
43 Mt Pring "
44 Mt Perry Marble
GULF OF CARPENTARIA
SOUTH PACIFIC OCEAN
NORTHERN TERRITORY
SOUTH AUSTRALIA
NEW SOUTH WALES
Tropic of Capricorn
Thursday I
Cooktown
Cairns
Townsville
Charters Towers
Bowen
Mackay
Rockhampton
Gladstone
Bundaberg
Maryborough
Gympie
Mt Isa
Cloncurry
Hughenden
Winton
Longreach
Charleville
Quilpie
Cunnamulla
Toowoomba
Warwick
BRISBANE
For details see Map 2

Quarries are located in the Ashgrove area. Kerr's quarry was worked by W. Kerr for building and monumental stones, but of late has been taken over by the Stirling Granite Coy. and used as a source of road metal.

(ii.) *Samford Granodiorite.*—The Samford Granodiorite is a light-grey, medium to coarse-grained rock of fresh appearance and high resistance to weathering agencies. It outcrops over a wide area in the Samford and Camp Mountain districts. The rock is comprised of plagioclase felspar, quartz, potash felspar, biotite, hornblende, pyroxene and magnetite. Crushing tests carried out on approximately 7-inch cubes have given results averaging about 19,500 pounds per square inch; specific gravity is 2·74, and weight 172 pounds per cubic foot.

Quarries are located in subdivision 3, portion 97, parish of Samford, county of Stanley, and worked for building and monumental stone by Messrs. P. J. Lowther and Son. Pty. Ltd., Lutwyche road, Bowen Hills, Brisbane. Samford Granodiorite is to be seen in the base of the City Hall, Brisbane; the major part of the base of the University of Queensland, St. Lucia, Brisbane; and the Cairncross Dry Dock, Brisbane.

For a time Mr. A. G. Stronach quarried the granodiorite at Camp Mountain. This stone is to be seen in the Australian Mutual Provident Society Building, Queen street, Brisbane. No quarrying is at present carried on at Camp Mountain.

(iii.) *Cedar Creek Granite.*—A pink granite of good quality outcrops in the Cedar Creek district, about 15 miles from Samford, and has been used with pleasing results in both building and monumental work. Increased demand could lead to a renewal of quarrying operations in this area.

Pink granite from Mr. A. G. Stronach's Cedar Creek quarry in the north-west part of portion 79v, Samsonvale, was used with excellent results in the Australian Mutual Provident Society Building, Queen street, Brisbane.

(iv.) *Mount Crosby (or Kholo) Granite.*—An unusually dark granitic rock occurs in the Mount Crosby area, about 12 miles W.S.W. of Brisbane. It is a dark greenish-grey, medium-grained rock of even texture. Plagioclase, augite, and biotite are the main constituents. All the minerals are very stable, and the stone does not seem to have any mineralogical or structural defects, and has an excellent appearance when polished. Its specific gravity is 2·84 and weight 177 pounds per cubic foot. Supplies for a number of buildings, including the Executive Building, Brisbane (where it has been used in alternate layers with the Enoggera granite); the Commonwealth Savings Bank, Albert street, Brisbane, and the Royal Insurance Building, Brisbane, have been drawn from this area. In those buildings no signs of deterioration of the stone have been noticed. Some acidic veins and basic segregations are to be seen but limited supplies of uniform grade rock of fairly large size are available. Quarries located in portion 43, Kholo, were worked for building and monumental stone. At present no quarrying is being done.

(v.) *Blackbutt Granite.*—The granitic outcrop in the Blackbutt district of the Brisbane River Valley covers a large area. Here the rock is a dark grey, medium-grained, even-textured, tonalite of bright appearance and with evenly distributed, well formed, dark minerals. The main constituents are plagioclase, quartz, biotite, hornblende and others. This stone takes a good polish and has a high resistance to weathering agencies. Its specific gravity has been determined as 2·87 and weight as 178 pounds per cubic foot.

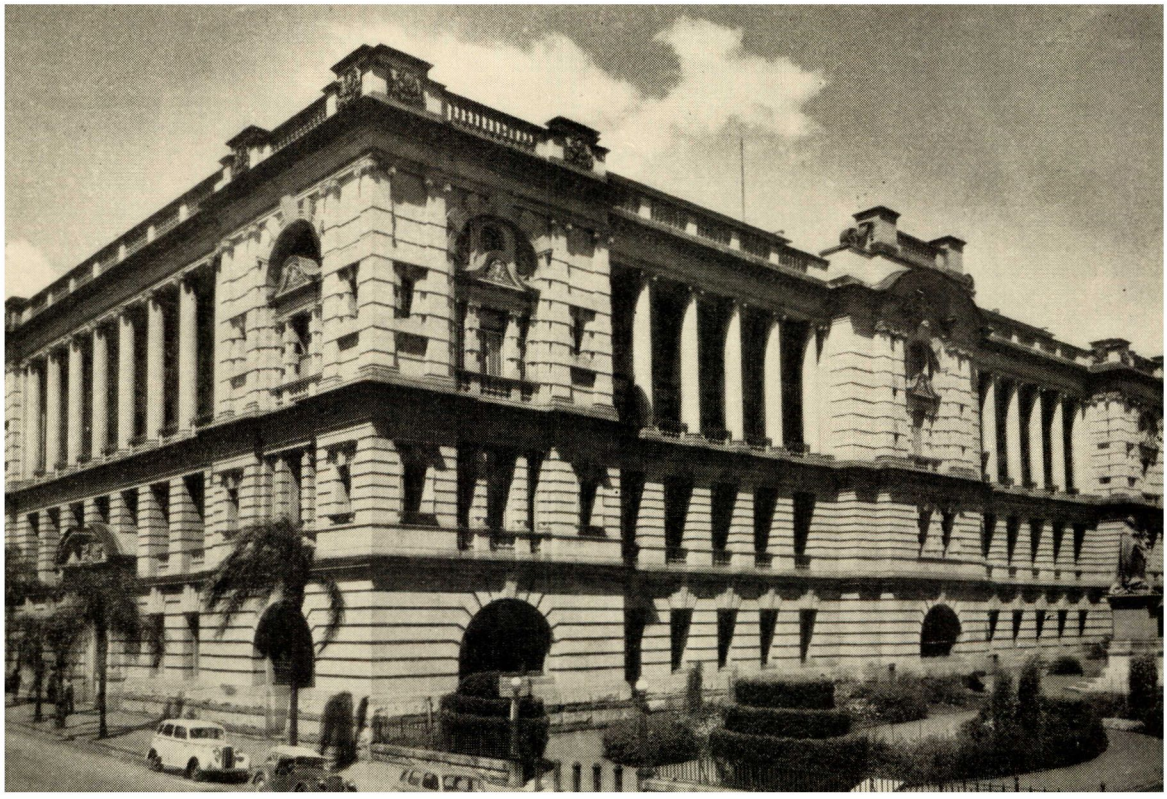
Of late Blackbutt has become an important source for the supply of grey granite to the building and monumental trades. Quarries worked by P. J. Lowther and Son are located in portions 99v and 100v, parish of Taromeo, about 1½ miles to 2 miles distant from Blackbutt. This stone has been used in the State Government Building, Anzac Square, Brisbane, the Commonwealth Bank, Rockhampton, and the Commonwealth Bank, Ingham. Blackbutt granite is shown to advantage in the Nash Memorial, Gympie.

(vi.) *Maroochydore Diorite.*—A deposit of hornblende diorite occurs in subdivision 308, portion 7, parish of Mooloolah, county of Cavendish, about 2½ miles from Maroochydore. The rock is made up essentially of plagioclase felspar and hornblende phenocrysts embedded in a groundmass of plagioclase felspar, with magnetite and ilmenite. It is bluish-grey, fine- to medium-grained, with, particularly in the marginal areas, large hornblende phenocrysts which enhance its appearance. The stone works well and takes an excellent polish. Resistance to weathering is remarkably high. The specific gravity is 2·70 and its weight per cubic foot about 169 pounds. Crushing tests gave an average result of 1,483 tons per square foot. The quantity of overburden is slight and the jointing such that commercial blocks are readily available. This deposit, which is easily accessible, occupies an area of approximately 12 acres and reserves have been estimated at one million cubic yards.

(vii.) *Crow's Nest Granite.*—Outcropping to the north and east of Crow's Nest and within easy reach of the town is a pink, medium-grained granite. Apart from a few small aplite veins which can be easily avoided in quarrying, the granite is very uniform. The jointing is rectangular and large blocks of high quality stone could be obtained. Quarries could be readily selected.

A grey granite occurring about 6½ miles north of Crow's Nest is quarried intermittently for monumental work, by R. Zeigler & Sons of Toowoomba on portion 17v, parish of Aduramba, county of Cavendish.

(viii.) *Greymare Granite.*—At Greymare, 20 miles west of Warwick, a grey granite outcrops over large areas. The stone has a clean black and white appearance, coarse grain, works well, and takes an



Executive Building, George St., Brisbane.—Base course alternate layers Enoggera Granite (light) and Mount Crosby Granite (dark). Main structure is Helidon Sandstone (Wright's Quarries) with columns of Yangan Sandstone.

Taxation Building, George Street, Brisbane.—Base course of Greymare Granite, balance is Sandstone from Wright's Quarries, Helidon.

State Government Insurance Building, Adelaide Street, Brisbane.—Base course is Blackbutt Granite, balance is Sandstone from Lowther's Quarry, Helidon.

excellent polish. This granite is composed of quartz, plagioclase, orthoclase, biotite, chlorite and magnetite. Weathering properties are good. It has a specific gravity of 2·66 and a weight of 166 pounds per cubic foot. The appearance of the stone varies according to whether it has been worked with the rift or with the grain. When worked with the rift, that is parallel to the flat flakes, the large black mica flakes give the rock a spotted appearance.

Surface boulders of Greymare granite have been worked for monumental and building purposes. It has been used in the Technical College Building, Warwick; the base of the Taxation Building, George and Elizabeth streets, Brisbane, and parts of the base of the University of Queensland, St. Lucia.

P. J. Lowther and Son worked surface boulders at Greymare and supplied the material for the University. No quarrying of Greymare granite is at present being undertaken.

(ix.) *Stanthorpe Granite.*—The Stanthorpe granite is a strongly pink, coarse-grained rock occurring over a wide area in the Stanthorpe district. It is mainly composed of quartz, orthoclase, plagioclase and biotite. This stone has had minor use in monumental work, but no rock has so far been quarried for building purposes.

(x.) *Wallangarra Granite.*—In the immediate vicinity of the township of Wallangarra is a large mass of beautiful dark-grey porphyritic granite, with large orthoclase crystals set in a groundmass of quartz, orthoclase, plagioclase, hornblende, augite and sphene. The presence of large porphyritic crystals set in a dark groundmass makes this rock admirably suited for decorative purposes. Weathering properties of the stone appear to be very good. The specific gravity of the Wallangarra granite is 2·69.

So far as is known, no attempts have been made to use this exceptionally beautiful stone.

(xi.) *Gracemere Quartz Diorite.*—At Gracemere about 7 miles from Rockhampton, a first class grey granitic rock occurs. In comparison with other Queensland grey granites, there is much more dark mineral in this stone, giving it a rich dark appearance. The rock is deep bluish-grey, medium-grained, and becomes darker still on polishing. Quartz, plagioclase, biotite, hornblende and magnetite are the main minerals present. It works well, takes a fine polish and is very weather resistant. Of specific gravity 2·933 and weight 183 pounds per cubic foot, this stone is non-absorbent and has a crushing resistance in excess of 950 tons to the square foot. Light-coloured acid veins and basic segregations appear to be absent in the rock and joints are few and indistinct.

Considerable demand now exists in the monumental and building trade for this stone. Quarrying is being carried on by Messrs. F. M. Allan and Co., Rockhampton, about 2¼ miles south of Gracemere railway station. Gracemere granite was used in the base of the Dental Hospital, Turbot street, Brisbane, and in part of the Cairncross Dry Dock, Brisbane.

(xii.) *Magnetic Island Granite.*—There is a pale-pinkish, medium-grained, granite outcropping in appreciable amounts on Magnetic Island. The rock is composed of quartz, felspar, biotite, hornblende, and magnetite. From this area stone, which takes a good clean polish and weathers well, has been obtained. Magnetic Island granite is used in building and monumental work, and is to be seen in the Customs House at Townsville.

(xiii.) *Townsville Granite.*—In and about Townsville a reddish, medium- to coarse-grained granite occurs. It consists of quartz, felspar, ferromagnesian minerals, and chlorite. While this stone has quite a rich red appearance, polishes well and withstands weathering processes it is somewhat lacking in relief. It has been used to a minor extent in monumental and building works. Melrose and Fenwick Pty. Ltd., Townsville. until recently were quarrying this stone.

(xiv.) *Cooktown Granite.*—A light-grey, porphyritic granite outcrops over an area about 3 miles in diameter in the Cooktown area. This stone of good working properties is used in the monumental trade.

(xv.) *Mackay and Bowen Granites.*— Granites of good appearance, varying grain size and texture, occur over wide areas in close proximity to these towns. In the event of an increased demand for granitic stone, these deposits would provide a ready source of supply.

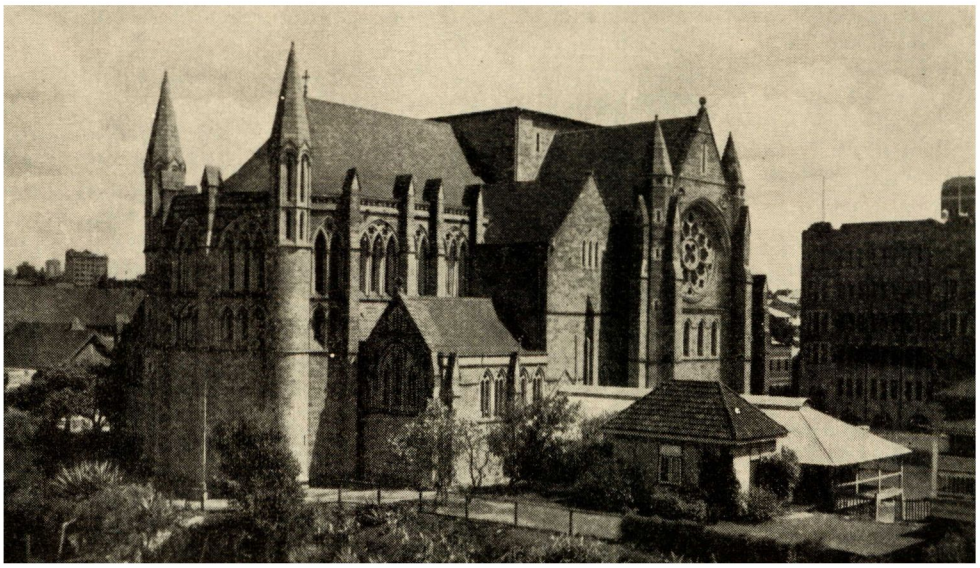
(2) VOLCANIC.

(*a*) Rhyolite and Trachyte.

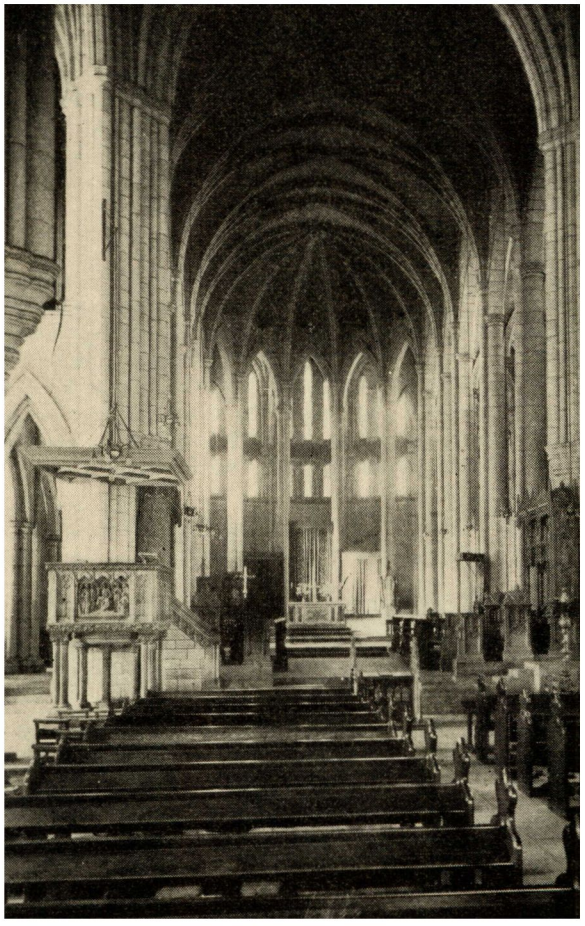
Although large and conveniently situated deposits of light-coloured rhyolites and trachytes occur in Queensland, no use has yet been made of these stones in buildings and monuments. These good quality volcanics are in many ways superior to sandstones although more costly to dress. They would probably come into use if an increased market for building and structural stone were created.

(i.) *Glass House Mountains Rhyolites and Trachytes.*—Light-grey fine-grained volcanic rocks occur over wide areas in the Glass House Mountains

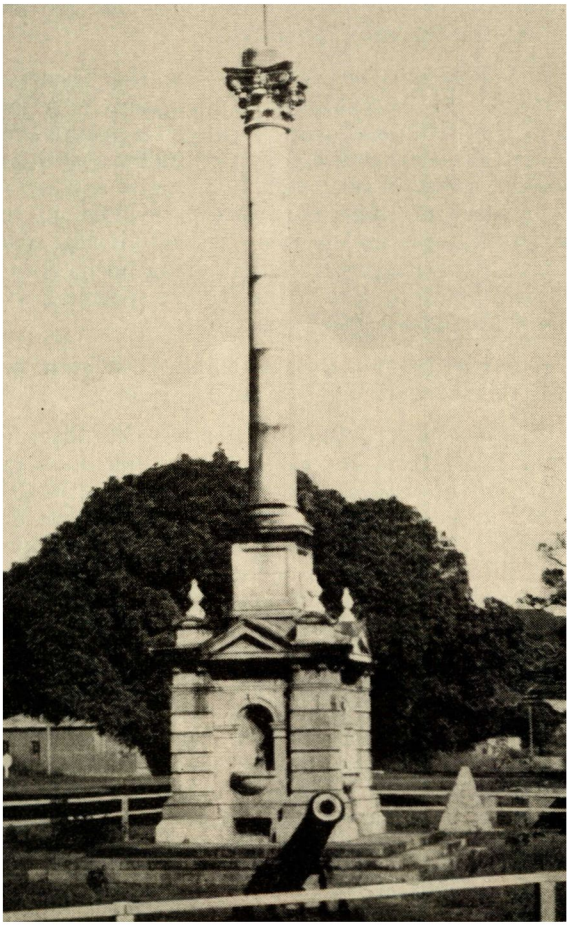
Part of a stockpile of granite blocks in Allen & Sons' Quarry, Gracemere, Rockhampton.



St. John's Anglican Cathedral, Brisbane.—Main Structure is of Brisbane Tuff.



Interior of St. John's Cathedral, Brisbane.—Interior Walls, Ceilings, and Piers are of Sandstone from Wright's Quarries, Helidon.



Cook Monument, Cooktown.—Murphy's Creek Sandstone on base of Cooktown Granite.

district. The presence of dark-blue and dark-green ferromagnesian minerals gives these rocks a pretty appearance. The main mineral constituents are sanidine, soda-rich augite, and minor quartz. Working qualities are good and the stone has an excellent appearance both rock-faced and smooth-dressed. The stone has a high resistance to weathering. The specific gravity ranges from 2·47 to 2·71, and weight from 154 to 169 pounds per cubic foot. Glass House Mountain volcanics have a high resistance to crushing, are practically non-porous and lie in close proximity to rail transport.

To date no material has been taken for building or monumental work from this area.

(ii.) *Glen Rock (Esk District) Rhyolite.*—A large deposit of light yellow-brown rhyolite occurs south of Esk and within easy reach of rail transport. The rock contains few "phenocrysts" and is composed of glassy material with quartz, anorthoclase and sanidine. Zeolites occur, in some cases, filling cracks in the rock. Rhyolite from this outcrop works freely, dresses well and has a fine appearance. It is non-porous and is fairly resistant to crushing. Specific gravity is 2·43 and weight 152 pounds per cubic foot.

No stone has been taken for building and monumental purposes but if an increased market was created, this deposit could become an important source of high quality, durable stone.

(*b*) Basalt.

Basalts are fairly common in Queensland and vary in texture from fine to coarse and vesicular They are extensively used for kerbing and road-making material. Although in some cases regarded as too dark and gloomy in appearance, some basalts have been used for building material.

(i.) *Toowoomba Basalt.*—In and about Toowoomba an important olivine basalt outcrops. It is a medium- to coarse-grained rock, hard, heavy and weather resistant and composed of olivine "phenocrysts" in a groundmass of mainly plagioclase felspars and augite, with minor amounts of olivine, magnetite and glass. This basalt has been widely used for guttering and kerbing and has had minor structural use. It is to be seen in a number of Toowoomba buildings, including St. Luke's Anglican Cathedral and Downlands College.

Quarries are now operated by the Toowoomba City Council.

(*c*) Tuff.

The Brisbane Tuff or "porphyry," as it is known in the building trade, has proved to be a most valuable asset to Brisbane for road-making, kerbing, retaining-wall, and building purposes. Of variable colour through white, pink, green, yellow, brown, and purple, the tuff is composed of occasional small mineral crystals of quartz, orthoclase and plagioclase set in a fine devitrified felspathic groundmass. Typical material is of specific gravity 2·16 and weight 135 pounds per cubic foot. Rough-dressed stones, having been subjected to less disturbance, weather much better than smooth-dressed.

The tuff occurs in a belt stretching through Brisbane in a north-south direction and having a width of about half a mile.

Quarries have been worked at Kangaroo Point, Spring Hill, and Windsor. At Stafford the tuff is actively quarried by Messrs. W. H. Bowser and Lever, Windsor, Brisbane. Tuff excavated in connection with building operations in the inner city area has been utilised. Owing to its restricted occurrence, supplies of tuff are limited. Windsor quarry is to be reopened to supply material for the additions to St. John's Anglican Cathedral, Ann street, Brisbane.

Tuff has been extensively used in retaining-walls, monuments, ornamental works, including walls, paths and porches, and buildings. In addition Brisbane Tuff was the main constituent in the Benedict Stone, which was manufactured over a short period in Brisbane and employed in some buildings. Chips of tuff were added to a coloured cementing-medium in the preparation of Benedict Stone.

Brisbane buildings in which tuff was used include St. Paul's Presbyterian Church; St. Stephen's Roman Catholic Cathedral; St. John's Anglican Cathedral; Criminal Investigation Branch, Police Department Building, George and Elizabeth streets; Rosemount Hospital, and in the base of the Treasury Building; General Post Office; Government Printing Office, and in Emmanuel College, St. Lucia.

Benedict Stone is to be seen in the Colonial Mutual Life Assurance Building, Queen street, Brisbane, and in the Shell Company of Australia, Shell House, Ann street, Brisbane.

II. Sedimentary.

(*a*) Sandstone.

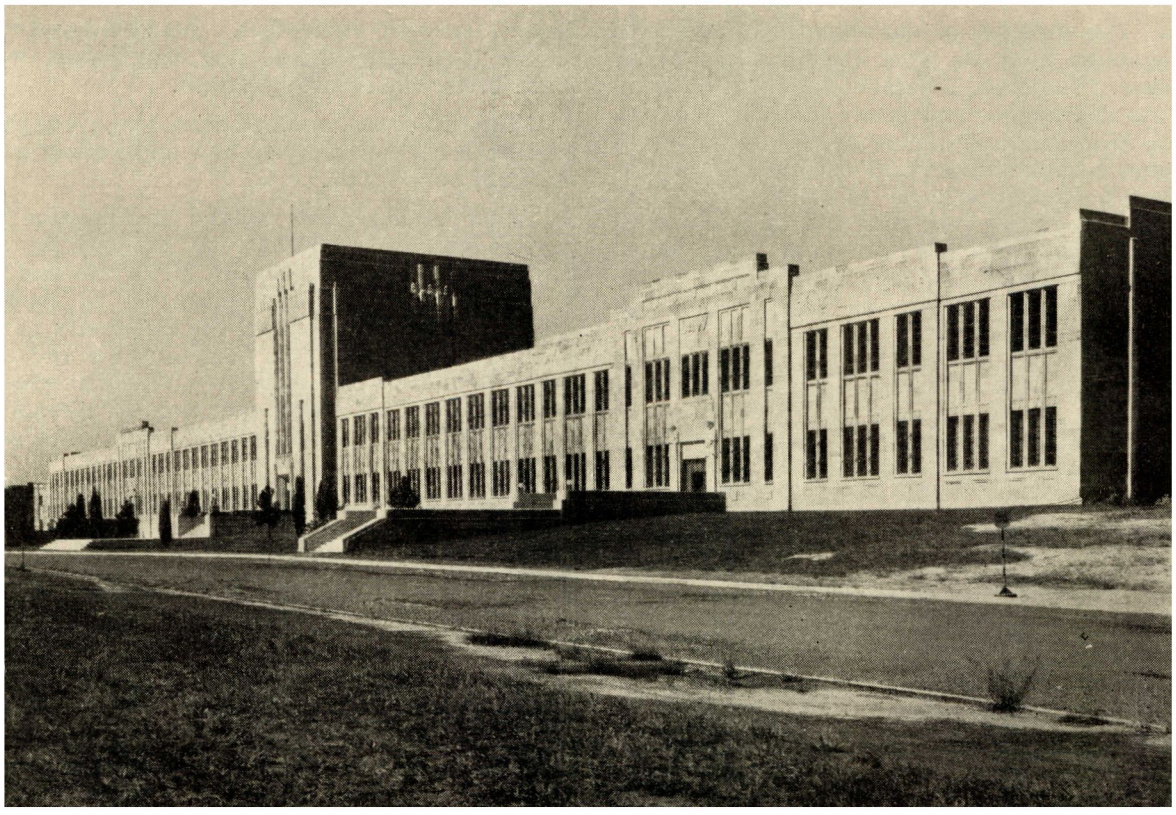
In Queensland all sandstones used or likely to be used are of Lower Mesozoic age. Queensland has abundant supplies of good quality sandstone and although the Helidon stone is the only sandstone now actively quarried, an increased demand could lead to the reopening of many other deposits.

Sandstones show great variation and adjacent beds in the one quarry may exhibit considerable differences.

(i.) *Helidon Sandstone.*—The Helidon sandstone is variable in colour through white, brown, lavender, and pink. The preference amongst local architects for variegated and banded Helidon sandstone has been responsible for the recent development of many deposits which otherwise would have been discarded.

The Helidon stone is highly favoured for exterior and interior building and monumental work.

At Wright's Quarries, which are now being worked about 5 miles from Helidon on the northern side of the railway line, brown, pink, white, and



The University of Queensland, St. Lucia, Brisbane, Main Block, North Front.—Helidon Sandstone.

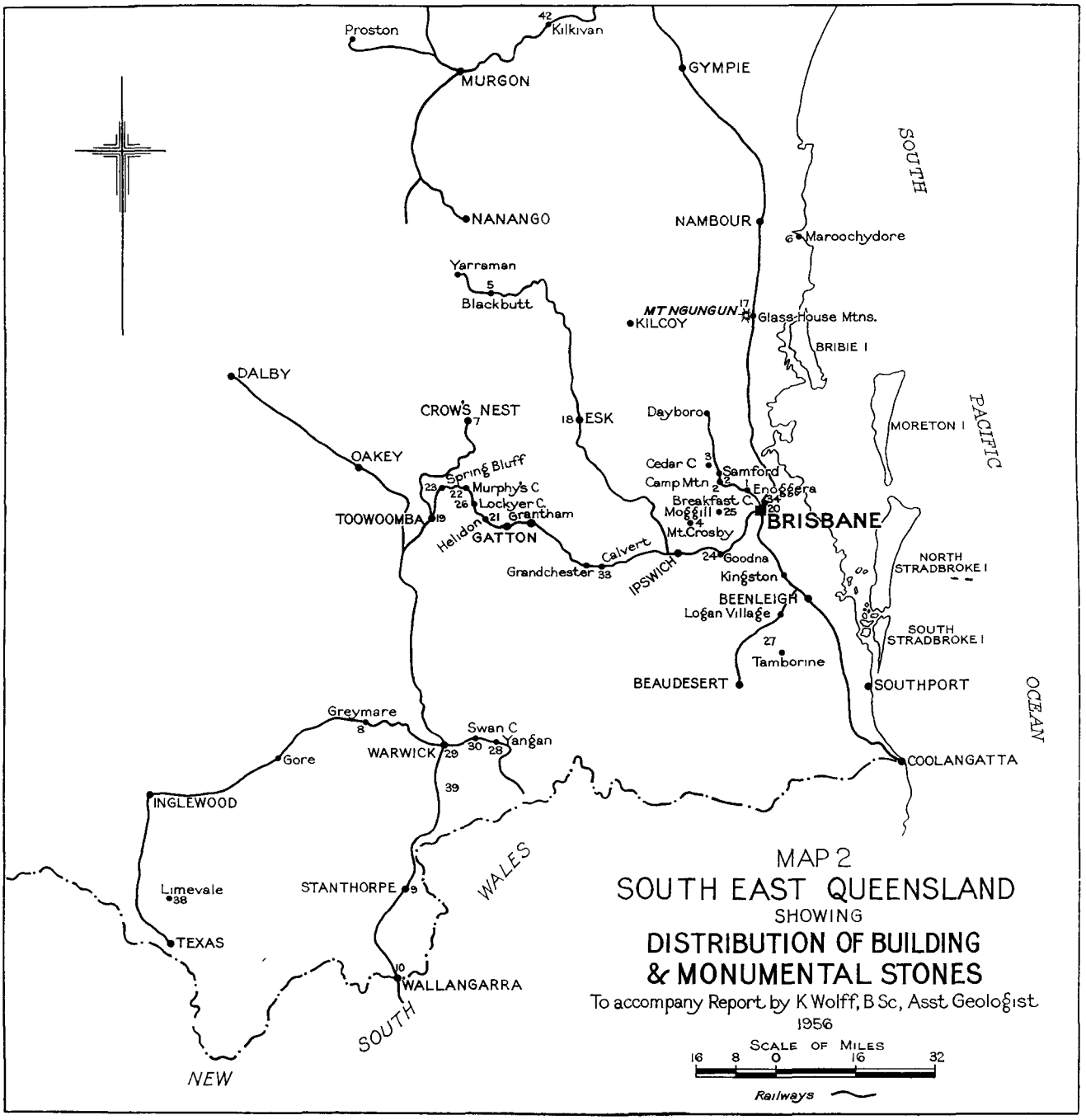
Entrance to Law School, University of Queensland, St. Lucia.—Helidon Sandstone.

The Cloisters, University of Queensland, St. Lucia, Brisbane.—Helidon Sandstone.

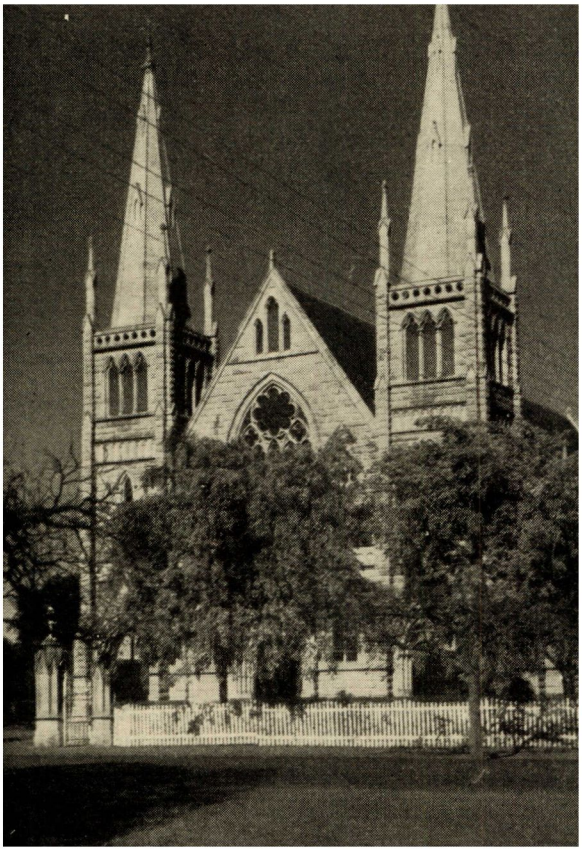
multi-coloured stones have been obtained. The sandstone is composed of quartz grain material, with a high felspathic cement content which accounts for its easy working properties. With specific gravity ranging from 2·26 to 2·42, an average weight of 146 pounds per cubic foot, the stone has an average resistance to crushing of 4,700 pounds per square inch. Tests for absorption in percentage of dry weight have given results ranging from 2·8 to 4·8. Unless exposed to constant moisture Helidon sandstone weathers well.

The Sandstone is horizontally bedded, with little overburden and the quarries take the form of shallow excavations.

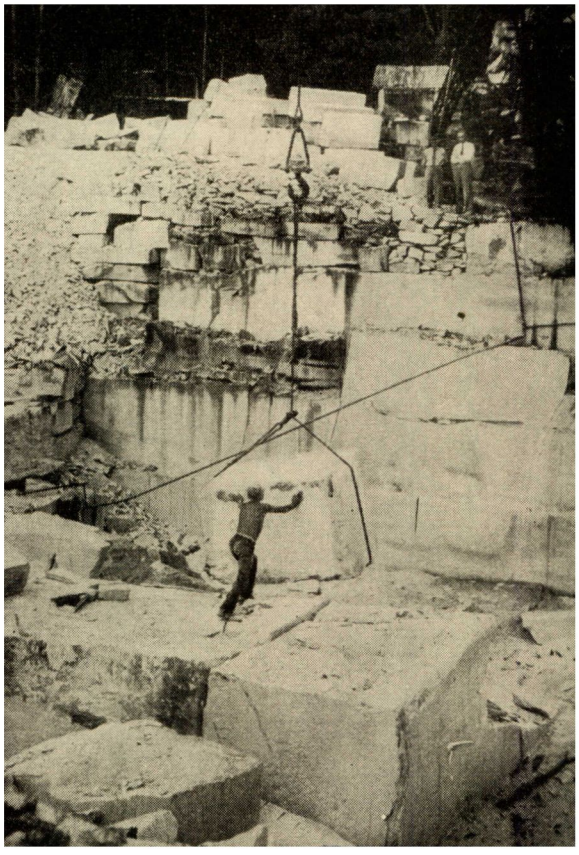
Helidon stone from Wright's Quarries has had extensive use in building and monumental work. Stone from this quarry was used in the following Brisbane buildings:—Old Government House (University of Queensland), George street; Executive Building; St. John's Anglican Cathedral; Government Printing Office; Central Technical College; Elizabeth street front of the General Post Office;



Court House and Post Office, Toowoomba.—Built of Murphy's Creek Sandstone.



St. Joseph's Cathedral, Rockhampton.—Stanwell Sandstone.



Petrie's Quarry, Helidon.

University of Queensland, St. Lucia; Commercial Bank, Creek and Queen streets; Taxation Building, Elizabeth and George streets, and also in the Post Office, Ipswich, and the Court House, Bundaberg.

The sandstone used in the City Hall, Brisbane, was obtained from a small quarrying area adjacent to Wright's Quarries and then operated by Mr. D. D. Carrick.

Lowther's Quarries are actively worked and high quality sandstone of good weathering properties and similar in type to that at Wright's quarries is obtained. Considerable colour variations also exist in these quarries. Stone from Lowther's workings has been extensively used in monuments and buildings included amongst which are the University of Queensland, St. Lucia, Brisbane; parts of the Treasury Building, Brisbane; Emmanuel College, St. Lucia, Brisbane; State Government Building, Anzac Square, Brisbane; Commonwealth Savings Bank, Albert street, Brisbane, and the Commonwealth Savings Bank, Ingham.

Helidon sandstone veneer is at present being used in the modernisation of the "Old" Courier Building, Queen street, Brisbane, and in the Australia and New Zealand Bank, Queen street, Brisbane.

Pearson's Quarries located to the north-west of Helidon were worked for a time. The sandstone is typical Helidon stone. Pink, white, and brown stone has been taken out and used in buildings and monuments. Specific gravity ranges from 2·20 to 2·38, and crushing resistance from 2,035 to 8,884 pounds per square inch. Details concerning tests are to be found in the accompanying table.

These quarries supplied stone for the South Brisbane Town Hall, pink sandstone parts of Central Railway Station, Brisbane, and parts of the Treasury Building, Brisbane.

Jude's Quarry—White Helidon sandstone from this quarry was used in the construction of the second wing of the Treasury Building, facing George street and the eastern part of Elizabeth street.

Miller's Quarry—Located several miles west of Helidon, this quarry has supplied mainly brown sandstone. Its specific gravity has been calculated as 2·31, its weight as 144 pounds per cubic foot and absorption as 4·36 per cent. Details of tests appear in the table. Stone from Miller's Quarry was used in the Presbyterian Church, Toowoomba, and in the Roman Catholic Church, Ipswich. This site was purchased and worked in turn by the State Government and P. J. Lowther and Son.

Phippard's Quarry—The white Helidon sandstone here is of specific gravity 2·33, weight 145 pounds per cubic foot and variable resistance to crushing, ranging when tested from 3,606 to 6,371 pounds per square inch. The major part of the sandstone used in the Central Railway Station, Brisbane, came from Phippard's Quarry.

(ii.) *Murphy's Creek Sandstone.*—In the Murphy's Creek area, approximately 20 miles from Toowoomba, an important white to brownish, medium- to coarse-grained sandstone of good weathering qualities occurs. The cementing-medium is argillaceous with varying amounts of secondary silica. Samples tested have given the following results:—Specific gravity ranging from 2·18 to 2·60, and weight 136 to 163 pounds per cubic foot; resistance to crushing is fair. The use of this commendable sandstone has been marked with considerable success.

Quarries were located at Cameron, 4 miles from Murphy's Creek railway station, Montgomery; McLachlan and Sheddon.

Murphy's Creek sandstone has had important use in monuments and buildings. It is to be seen in the following buildings:—Public Library, William street, Brisbane; columns of Treasury Building, George street, Brisbane; portion of the General Post Office, Brisbane; portion of the Customs House, Brisbane; Queensland National Bank (National Bank of Australia), Queen street, Brisbane; portico of Old Government House, George street, Brisbane; gate piers of Botanic Gardens, Brisbane; colonnade of Parliament House facing George street, Brisbane; Post Office, Toowoomba; Court House, Toowoomba; Railway Station, Toowoomba; Customs House, Maryborough.

(iii.) *Highfields Sandstone.*—A large deposit of white, medium-grained sandstone occurs in the Spring Bluff area about 9 miles from Toowoomba. Generally soft with a high proportion of cementing-material, this stone weathers badly and becomes discoloured. However some variation in the sandstone does exist and better material can be located.

Quarries were worked for building and monumental requirements about 1½ miles west of Spring Bluff.

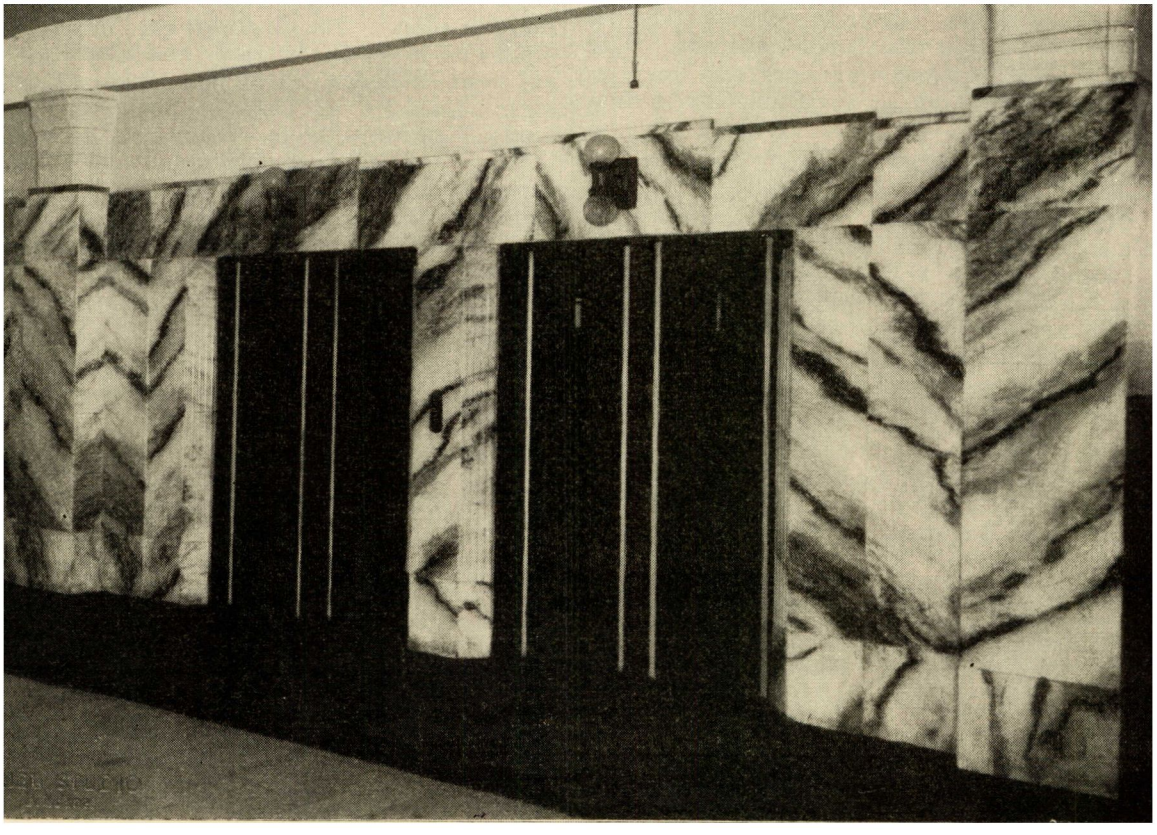
The first wing constructed of the Treasury Building, Brisbane, facing Queen, William, and the western part of Elizabeth streets was of Highfield sandstone on a tuff base.

(iv.) *Goodna Sandstone.*—The Goodna district has produced some high quality stone for Brisbane buildings. Here a light-pink to light-brown, medium-grained sandstone with argillaceous cementing-material occurs. Much of the stone has excellent weathering qualities and maintains a clean appearance.

Jeay's Quarry was the most important source of supply. Material from this quarry was used in the major part of Parliament House, Brisbane; Old Government House (University of Queensland), Brisbane, and the wall of the Botanic Gardens in Alice street, Brisbane.

The Woogaroo Quarry supplied stone for the tower and tracery at St. Paul's Presbyterian Church, Leichhardt street, Brisbane; alterations to the Supreme Court, Brisbane, and for the wall at the South Brisbane Cemetery.

General Post Office, Queen Street, Brisbane.—Murphy's Creek Sandstone.



St. Mark's Church, Warwick.—Built of Sandstone from Bishop Tuffnell's Quarry Warwick.

Geary's Quarry was worked for the stone used in the old St. Stephen's Roman Catholic Church, Elizabeth street, Brisbane.

(v.) *Moggill Sandstone.*—A whitish to grey and brown, fine-grained sandstone, in beds of varying thickness, occurs in the Moggill area. On testing for potential use by the Railway Department, some Moggill sandstone had a specific gravity of 2·39 and a weight of 149 pounds per cubic foot and absorption 2.98 per cent. by weight.

Quarries were worked on portions 110 and 111, parish of Moggill. From these sites, high quality, light-coloured sandstone of fairly good weathering properties and in reasonably large blocks, could be obtained. A quarry site is also to be found on portion 135, parish of Moggill.

Moggill sandstone was used in the west portion of the Alice street front of Parliament House, but the exact location of the quarry from which this stone was taken is unknown.

(vi.) *Lockyer Creek Sandstone.*—Quarries were located between Murphy's Creek and Helidon, about 75 miles west of Brisbane. Tests carried out in 1875, gave its specific gravity as 2·45, weight as 153 pounds per cubic foot and absorption as 3·7 per cent. Lockyer Creek sandstone was used in parts of the Dry Dock, South Brisbane.

(vii.) *Beaudesert–Logan Village Sandstone.*—A brown, coarse-grained, Bundamba-type sandstone outcrops in the Beaudesert–Logan Village area. Much of the stone is of poor quality, though some variation in the sandstone exists. Quarries were worked in the Logan Village and Tamborine districts. The stone was used in monumental work and for the Mundoolun Anglican Church at Mundoolun, a few miles from Tamborine.

(viii.) *Yangan Sandstone.*—From the Yangan district about 13 miles south-east of Warwick comes a brown, fine-grained sandstone of even texture with argillaceous cementing-material. The stone works well and takes a sharp arris. Tests carried out in 1901 on the stone gave the following results:—specific gravity 2·61 weight 163 pounds per cubic foot, resistance to crushing 2,800 pounds per square inch, and absorption 8.7 per cent. The bedding is more or less horizontal and the jointing widely spaced.

Yangan sandstone was quarried near the railway station. The stone was used for monumental and building works. It is to be seen in the Executive Building, Brisbane (columns and recessed walls of the William street, Queen's Park, and George street fronts, and in the upper stories of the Stephen's Lane front); the Royal Insurance Co. Building, Queen street, Brisbane; Byrnes' Statue; Post Office, Warwick; Technical College, Warwick; the Police Buildings, Warwick; and in parts of the Warwick Railway Station.

(ix.) *Warwick Sandstone.*—Large deposits of light-brown, medium- to coarse-grained sandstone are readily available in close proximity to the town. The cementing-material is felspathic and the sandstone is fairly porous and shows current bedding. In this area overburden is generally small.

The following quarries were worked for building and monumental stone:—

Gunn's Paddock Quarry—Stone from this quarry, about 2 miles north of Warwick, was used in the Presbyterian Church, Warwick.

Mitchell's Quarry (Gollan's Quarry)—Mitchell's quarry supplied the sandstone for the Warwick Convent.

Mt. Tabor Quarry—Located on a ridge running north-west from Mt. Tabor, the quarry here was worked for the stone used in the Police Buildings, Warwick; Railway Building (old portion), Warwick; Court House, Warwick; National Bank of Australia, Warwick, and in the rear of the Warwick Town Hall.

Sidling Quarries (including Bishop Tuffnell's quarry)—From these quarries, Warwick sandstone obtained was used in St. Mark's Anglican Church, Warwick; St. Mary's Roman Catholic Church, Warwick; Methodist Church, Warwick; and the Masonic Hall, Warwick.

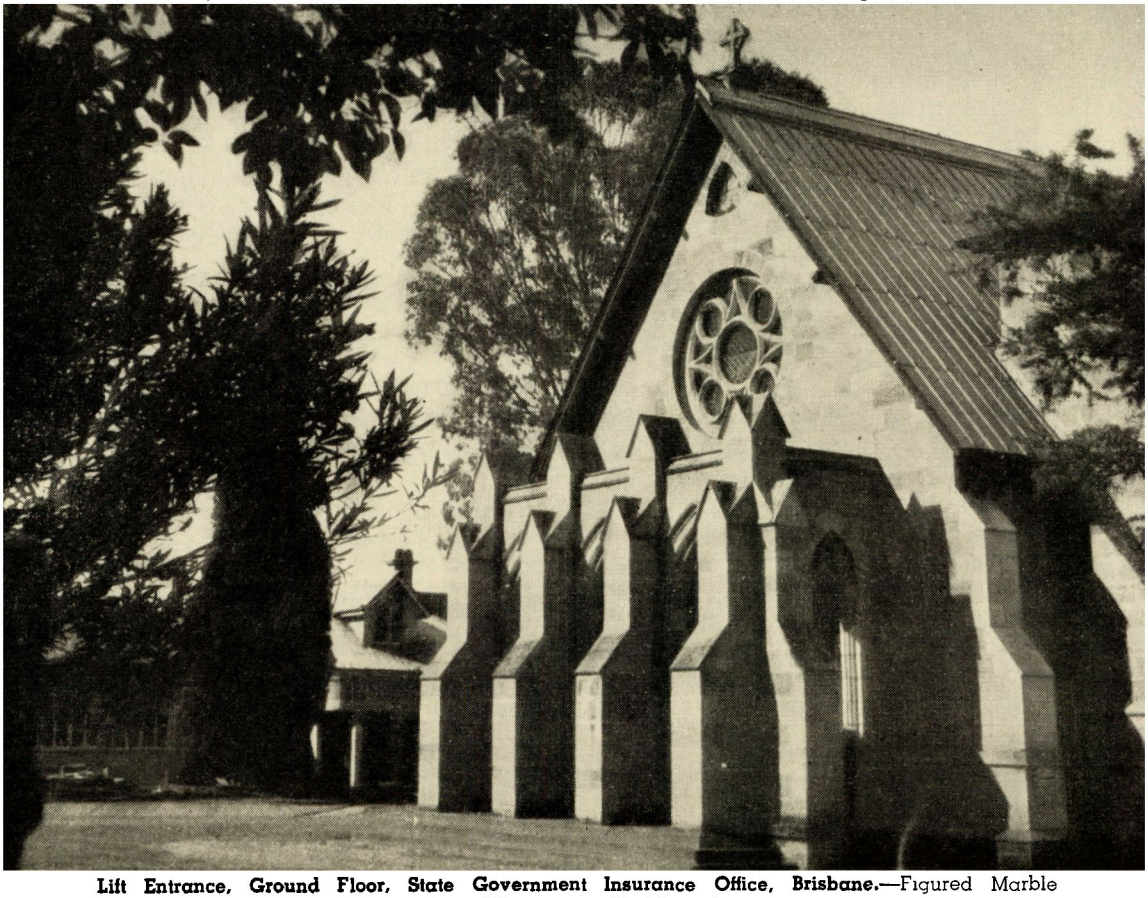
(x.) *Swan Creek (Mt. Sturt) Sandstone.*—A brown, fine-grained, argillaceous sandstone has been quarried in the Mt. Sturt district, about 9 miles from Warwick. It was used in the front of the Warwick Town Hall and in the Old Railway Building, Warwick.

(xi.) *Stanwell Sandstone.*—Good quality sandstone occurs in the Stanwell area, about 20 miles from Rockhampton. The light-brown, medium-grained, sandstone works fairly easily and weathers well. It has been extensively used in monuments and buildings. Quarries are located about 2 miles from Stanwell railway station. Stanwell stone is to be seen in the following Rockhampton buildings:—Post Office; Roman Catholic Cathedral; Customs House; Anglican Cathedral; Technical College; Commercial Bank, and others. The stone was also used in the Customs House, Townsville.

(xii.) *Pentland and Torrens Creek Sandstone.*—In the Pentland and Torrens Creek areas near Charters Towers, a brown sandstone has been quarried for monumental use in Charters Towers and Townsville.

(xiii.) *Calvert Sandstone.*—A brown, fine-grained, even-textured sandstone with argillaceous cementing occurs in the Calvert area, a few miles from Grandchester, which is 44 miles from Brisbane. In 1896 the stone was tested by the Railway Department and found to have a specific gravity of 2·39 and weight of 149 pounds per cubic foot. Resistance to crushing results of specimens tested ranged from 3,733 to 4,485 pounds per square inch. Weathering properties in many examples of this stone are not good. Calvert sandstone from Brodie's Quarry and from Beatty and Walsh's Quarry has been used in monumental and building work. It was utilised in parts of Castlemaine Brewery, Brisbane.

Main Dining Room, Tattersall's Club, Brisbane.—Pilasters and surrounds of figured Ulam Marble.



Lift Entrance, Ground Floor, State Government Insurance Office, Brisbane.—Figured Marble from Ulam, near Rockhampton

(xiv.) *Breakfast Creek Sandstone.*—Breakfast Creek sandstone varies in colour from greyish-white to light-brown. It is a coarse-grained, very friable rock of poor weathering qualities. Cementing material makes up a large part of this stone. Within the beds some variation in the quality of stone has been noticed. Quarries were worked at Albion, Brisbane, above Breakfast Creek. This stone was used in the facings of St. Stephen's Cathedral, Brisbane; the base of Roma Street Railway Station, Brisbane; old building of General Post Office, Brisbane, and in the Caretaker's Lodge and fence of the Supreme Court, Brisbane.

III. Metamorphic.

(*a*) *Marble.*

Queensland is well provided with high class marbles. Our marble deposits exhibit wide ranges of colour and considerable variation in textures and in many cases possess all of the qualities of first class commercial marbles. Reserves of good grade material are extensive.

The marbles are crystalline, granular rocks composed mainly of calcite grains. Many marbles are more or less coloured by the presence of impurities such as carbonaceous matter and iron oxides.

(i.) *Ulam Marble.*—In the South Ulam area about 25 miles from Rockhampton, a large deposit of commercial marble occurs. This high quality marble is generally milky white, relieved in part by dark coloured markings and veinings, coarse-grained and fairly even-textured and shows translucence on the edges. Ulam marble is easily worked and takes a high polish, but owing to the coarse-granular nature, care is necessary with regard to arris. Weathering properties of the stone are good. Iron-bearing minerals are absent and no brown or yellow films develop on exposure to weather. Its specific gravity is 2·68 and weight 168 pounds per cubic foot. Absorption is low, being calculated as 0·14 per cent. by weight. Crushing resistance tests have given results of 5,570, 5,222 and 6,225 pounds per square inch. Jointing is inconspicuous but a few strong joints and some indistinct small ones are known to be present. Outcrops are noticed over a wide area and as the marble extends at depth, reserves would be great.

Quarries are at present operated about 14½ miles by road from Bajool railway station, by P. J. Lowther and Son.

Ulam marble has been extensively used in monumental, interior building, and terrazzo work. It is to be seen in the following buildings:—State and Commonwealth Government offices, Anzac Square, Brisbane; Penney's Building, Queen street, Brisbane; the Norwich Union Building, Queen street, Brisbane; Finney's Building, Queen street, Brisbane; State Government Insurance Offices, Adelaide street, Brisbane; Commonwealth Bank, Adelaide and Albert streets, Brisbane; Lennon's Hotel, George street, Brisbane; Tattersalls Club Building, Queen street, Brisbane, and others.

(ii.) *Northumberland Islands Marble.*—This group of islands is situated about 12 miles north-east of the northern end of Broad Sound Peninsula and midway between Rockhampton and Mackay. On some of the islands in the Northumberland Group limestones and marbles occur. Deposits are known on Mortar, Hunter, and Marble Islands.

The marble is present as interlaminations in the metamorphic rocks of Mortar Island. Colour variations are evident, pink, white, and blue predominating. Only small tonnages have so far been quarried. This marble takes a high polish.

Hunter Island contains three important deposits. These are—

Favosites Point—Here the marble occurrence is about 400 ft. in diameter. On the eastern side, white and blue marbles are overlain by slates, while on the western side pink marble is predominant. The reserves above high-water mark have been estimated at 250,000 tons.

Limekiln Beach—A comparatively thin bed of good quality ornamental marble, overlying slates occupies an area 400 ft. by 300 ft. The marble is variegated pink with some green veining and mottle grey.

Silica Hill—A large deposit of pink and green mottled marble is known.

Marble Island—On this island pink, white and bluish-grey marble occurs.

(iii.) *Gladstone District.*—In the Gladstone District deposits of marble are common. They vary in colour from white to dark blue and red and in grain from coarse to fine. Much of the stone is veined, mottled and brecciated, takes a beautiful polish and would be suitable for ornamental purposes. The most conveniently located deposits are in the Calliope area, about 10 miles from Gladstone.

So far only small amounts of marble have been taken from this area.

(iv.) *Limevale Marble.*—At Limevale, about 10 miles from Texas, a good quality marble is worked. Within this deposit centred about Limevale the variety of colour is great, bluish-white, greyish-white, light-grey, dark-grey, grey with white and rose-coloured veins and patches, mottled red, red, blue-black with yellow streaks, and black being present. The marble is even-textured, tough and firm, works well, takes a fine arris and is easily polished. In most cases the finished stone has an excellent appearance.

Large quantities exist and blocks of variable size may be obtained. Although used to some extent in monuments and buildings, the stone is largely worked for chip material for terrazzo. The deposit is quarried by the Marberete Coy., Lutwyche road, Bowen Hills, Brisbane.

Dove grey marble from Limevale was used in the Crematorium, Mt. Thompson, Brisbane, and in the Commonwealth Government Offices, Anzac Square, Brisbane, where it was used with the Ulam marble.

(v.) *Elbow Valley Marble.*—The deposit at Elbow Valley, about 20 miles from Warwick consists of generally pure white to cream-coloured fine-grained marble. Some of the material has been used for monumental and other purposes, but a large part of the output is taken for terrazzo work. Quarrying is done by the Marberete Coy.

Elbow Valley marble was used in the garage of Cribb and Foote Ltd., Ipswich.

(vi.) *Mowbray River Marble.*—In the Mowbray River area, a deposit of cream to white marble carrying in places thin, straight or undulating black bands, occurs as a lens about 5 chains long and up to 35 ft. wide interbedded with phyllites. The deposit occupies a position on the southern slope of a ridge overlooking the Mowbray River, about 2 miles from its mouth and approximately 10 miles south-east of Mossman. Much of the stone has a good appearance, is tough and solid and polishes well. Some of the stone should be ideal for ornamental purposes.

The deposit is quarried, but so far the whole of the output has been crushed and sold locally as a fertiliser.

(vii.) *Mount Perry District.*—In the Goodnight Scrub Reserve, 16 miles east of Mount Perry and within 6 miles of rail at Morganville, there are several occurrences of marmorized limestone of some prospective value as marble. They are vertically disposed beds up to 100 ft. or more wide. The main deposits are (a) about the junction of Limestone and Tenningering Creeks; (b) on Back Creek, ¼ mile to the south; and (c) near Kalliwa Creek.

The dominant colour is a light blue to grey; it is doubtful if high-class *white* monumental marble could be obtained. The possible commercial value of the deposits for marble production has not been investigated.

(*b*) SERPENTINITE.

Serpentinites may be fine- to coarsely-granular and are generally dark green in colour. They are composed essentially of serpentine minerals with chlorite, talc, magnesite, olivine, pyroxene, and hornblende. Specks and crystals of magnetite and chromite are common. Many serpentinites are saturated with secondary silica, which makes them much harder. Provided the rock selected is hard, firm and unaffected by weathering processes, the serpentinites would be ideal for ornamental work. Outcrops of good quality serpentine, which should take a fair polish, are known in the Rockhampton-Marlborough area, the Kilkivan district and at Mount Pring in the Bowen area.

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TABLE 1.

TABLE SHOWING CHEMICAL ANALYSES OF QUEENSLAND BUILDING STONES.

Rock.	Locality.	Silica.	Alumina.	Soda.	Potash.	Magnesia.	Lime.	Ferric Oxide.	Ferrous Oxide.	Water, &c.	Moisture.	Loss on Ignition.	Insolubles	Other Constituents.	Total.
Granite ..	Enoggera	71 50	14 13	2·97	2 86	1 17	2 70	0 60	3 23	0·42	..	..		0 76	100·34
Granite ..	Samford	61 54	19·03	2·84	2 76	2 97	4 90	..	5 04	0·45	..	..	.	0 80	100 33
Granite ..	Greymare	69 70	17 70	3·12	1 36	3 12	2·29	1 94	1 40	0 72		..	..	0 19	99 61
Granite ..	Stanthorpe .. .	76·19	11·53	3·80	4 14	0 60	1 14	0 84	1 25	0 28	..	..	..	0·50	100 27
Rhyolite .	Mount Ngun Ngun Glass House Mountains	72 38	12·21	3 52	5·20	0·17	0 18	3·36	0 69	1 55	.	..	..	1 00	100 26
Rhyolite ..	Mount Conowrin Glass House Mountains	74 20	11·75	4 25	5 00	0 30	0 19	1 92	1 30	0 30	..	..	..	0 94	100 12
Rhyolite ..	Glen Rock, Esk ..	72 73	13·57	4·98	3 74	0 42	1 00	0 69	1 43	1 45	..	..	..	0 11	100 12
Basalt ..	Municipal Quarry, Toowoomba	50 27	12 50	3 29	1 42	10 25	7 52	2 44	8 18	1 60	..	..	..	3 04	100 51
Sandstone ..	Wright's Quarry, Helidon	90 80	0 7	..	..	trace	nil	3 7	..	4 90	..	..	..	..	100 10
Sandstone ..	Pearson's Quarry, Helidon	94 30	0·8 (includes ferric oxide)	..	..	..	0 3	..	..	4 60	..	..	..	..	100 0
Sandstone ..	Miller's Quarry, Helidon	90 90	0 5	..	..	trace	nil	0 3	..	5 4	..	.		..	100 1
Sandstone ..	Murphy's Creek ..	89 20	5·9 (includes ferric oxide)	..	..	trace	0 9	(included in alumina)	.	4 0	..	..	..	..	100 0
Sandstone ..	Highfields	80 50	14 0 (includes ferric oxide)	..	..	0 25	1 79	(included in alumina)	..	3 56	..	.	.	..	100·0
Sandstone ..	Yangan .. .	93 50	3 1 (includes ferric oxide)	..	..	trace	0 40	(included in alumina)	..	3 0	..	..	..	..	100 0
Marble.. ..	Ulam	..	0 2	..	..	0·4	55·30	..	trace	..	0·1	43 8	0·2	..	100 0
Marble.. ..	Mowbray River ..	1 2	0·7	..	..	0 4	54·9	..	0·4	..	0 1	42·6	..	..	100·30
Marble.. ..	Elbow Valley	..	0 6 (includes iron oxides)	..	..	0 3	54 7	..	..	..	..	43 0	1·2	..	99·8

TABLE II.

TABLE SHOWING RESULTS OF TESTS ON QUEENSLAND SANDSTONES (AFTER RICHARDS).

Stone.	Quarry.	Colour.	Specific Gravity.	Weight in Lb./ Cu. Ft.	Absorption Percentage of Dry Weight.	Resistance to Crushing.					Reference Authority.	Remarks as to Object of Tests and Character.
						Size of Specimen in Ins.	Cracking Pressure in Lb	Crushing Pressure in Lb.	Crushing Resistance in Tons/ Sq. Ft.	Crushing Resistance in Lb per Sq. In		
Helidon Sandstone ..	Wright ..	Brown .	2 42	151	4 33	6 x 3 x 3		43,700	305 42	4,751	Railway Department	Crushed dry on bed 26th April, 1901
Helidon Sandstone ..	Wright .	Brown .	2 42	151	4 39	3 x 3 x 3	.	38,970	299 10	4,537	Railway Department	Crushed dry on bed 26th April, 1901
Helidon Sandstone ..	Wright ..	Brown .	2 42	151	4 70	3 x 3 x 3	39,000	46,750	330 40	5,140	Railway Department	Crushed dry on edge 26th April, 1901
Helidon Sandstone ..	Wright .	Brown	2·28	143	4 00	3 x 3 x 3	..	48,160	344 00	5,350	Railway Department	4th April, 1899
Helidon Sandstone ..	Wright .	Brown .	2·42	151	4 80	4 x 4 x 4	..	36,000	144 60	2,250	Public Works Department	Executive Building tests, 1901
Helidon Sandstone ..	Wright .	Brown	2 42	151	4 80	4 x 4 x 4	36,000	39,590	159 10	2,475	Public Works Department	Executive Building tests, 1901
Helidon Sandstone ..	Wright .	Brown	2 42	151	4 80	4 x 4 x 4	42,500	49,690	201 20	3,130	Public Works Department	Executive Building tests, 1901
Helidon Sandstone ..	Wright .	Brown .	2·34	146	4 41	..		.	324 00	5,040	Public Works Department	Government Printing Office tests, 1911
Helidon Sandstone	Wright	Brown	2 34	146	4 41	.		.	344 25	5,355	Public Works Department	Government Printing Office tests, 1911
Helidon Sandstone ..	Wright .	Brown .	2 26	141	..	4 x 4 x 4		81,900	326·00	5,076	Public Works Department	Central Technical College, 1911 crushed dry on bed
Helidon Sandstone ..	Wright ..	Brown .	2 26	141	2 8	4 x 4 x 4		58,940	233 00	3,634	Public Works Department	Central Technical College, 1911 crushed wet bed
Helidon Sandstone ..	Wright ..	Brown .	2 30	143	..	3 x 3 x 3		54,720	385 71	6,000	Railway Department	Crushed dry on bed Central Railway Station, 1900
Helidon Sandstone ..	Wright ..	Brown ..	2·30	143	..	3 x 3 x 3	.	61,550	439 66	6,700	Railway Department	Crushed dry on edge Central Railway Station, 1900
Helidon Sandstone	Wright ..	Brown ..	2 30	143	..	6 x 3 x 3	.	43,680	310 13	4,824	Railway Department	Crushed dry on bed Central Railway Station, 1900
Helidon Sandstone .	Wright ..	Brown .	2 30	143	3 55	6 x 3 x 3		33,720	238 55	3,710	Railway Department	Crushed wet on bed Central Railway Station, 1900
Helidon Sandstone ..	Wright ..	Brown	2 37	148	..	3 x 3 x 3		71,780	509 48	7,925	Railway Department	Crushed dry on bed Central Railway Station, 1900
Helidon Sandstone ..	Wright .	Brown ..	2 37	148	..	3 x 3 x 3	.	75,610	538 81	8,381	Railway Department	Crushed dry on edge Central Railway Station, 1900
Helidon Sandstone ..	Wright ..	Brown	2 37	148	..	6 x 3 x 3		60,640	432 70	6,731	Railway Department	Crushed dry on bed Central Railway Station, 1900
Helidon Sandstone	Wright .	Brown	2 37	148	2 86	6 x 3 x 3		36,760	260·05	4,045	Railway Department	Crushed wet on bed Central Railway Station, 1900
Helidon Sandstone	Wright	Brown .	..	153	..	4 x 4 x 4	49,950	56,480	..	3,528	Public Works Department	Government Savings Bank tests, 1915
Helidon Sandstone	Wright .	Brown .	..	153	..	4 x 4 x 4	69,000	69,000	.	4,312	Public Works Department	Government Savings Bank tests, 1915
Helidon Sandstone ..	Wright .	Brown ..	..	153	..	4 x 4 x 4	67,200	77,800	..	4,762	Public Works Department	Government Savings Bank tests, 1915
Helidon Sandstone	Miller ..	Brown ..	2 31	144	4·36	..		.	328 50	5,110	Public Works Department	Government Printing Office tests, 1911
Helidon Sandstone .	Miller ..	Brown ..	..	148	..	4 x 4 x 4	42,560	51,744	.	3,234	Public Works Department	Government Savings Bank tests, 1915
Helidon Sandstone ..	Miller ..	Brown ..	..	148	..	4 x 4 x 4	41,440	41,440	..	2,590	Public Works Department	Government Savings Bank tests, 1915
Helidon Sandstone	Miller ..	Brown ..	..	148	..	4 x 4 x 4	47,488	47,488		2,968	Public Works Department	Government Savings Bank tests, 1915
Helidon Sandstone	Pearson ..	White ..	2 30	144	6·2	4 x 4 x 4	.	36,710	152 00	2,295	Public Works Department	Executive Building tests, 1901
Helidon Sandstone	Pearson ..	White ..	2 30	144	6.2	4 x 4 x 4	29,250	34,100	136 90	2,130	Public Works Department	Executive Building tests, 1901
Helidon Sandstone	Pearson .	White ..	2 30	144	6 2	4 x 4 x 4	27,900	32,570	130 80	2,035	Public Works Department	Executive Building tests, 1901
Helidon Sandstone ..	Pearson .	White .	2 32	139	3 5	3 x 3 x 3		40,320	288	4,480	Railway Department	1899
Helidon Sandstone	Pearson	Brown	2 27	142	3 5	3 x 3 x 3		35,840	256	3,950	Railway Department	1899
Helidon Sandstone	Pearson	Pink	2 33	146	2 7	3 x 3 x 3	.	40,320	288	4,480	Railway Department	1899
Helidon Sandstone ..	Pearson	Purple	2 38	149	2 7	3 x 3 x 3		60,240	416	6,700	Railway Department	1899
Helidon Sandstone .	Pearson .	Brown	2·20	138	2 3	3 x 3 x 3		30,120	208	3,350	Railway Department	1899

TABLE II.

TABLE SHOWING RESULTS OF TESTS ON QUEENSLAND SANDSTONES (AFTER RICHARDS)—*continued.*

Stone.	Quarry.	Colour.	Specific Gravity.	Weight in Lb./ Cu. Ft.	Absorption Percentage of Dry Weight.	Resistance to Crushing.					Reference Authority	Remarks as to Object of Tests and Character.
						Size of Specimen in Ins	Cracking Pressure in Lb.	Crushing Pressure in Lb.	Crushing Resistance in Tons/ Sq. Ft.	Crushing Resistance in Lb. per Sq. In.		
Helidon Sandstone	Pearson ..	White ..	2 21	138	.	3 x 3 x 3		51,340	365 5	5,685	Railway Department	Crushed dry on bed
Helidon Sandstone	Pearson	White	2 21	138	.	3 x 3 x 3		65,380	468 5	7,287	Railway Department	Crushed dry on edge
Helidon Sandstone	Pearson .	White	2 21	138		6 x 3 x 3		53,570	388 7	6,047	Railway Department	Crushed dry on bed
Helidon Sandstone	Pearson	White ..	2 21	138	3 66	6 x 3 x 3		37,470	268 5	4,176	Railway Department	Crushed wet on bed
Helidon Sandstone	Pearson .	Pink ..	2 26	141	.	3 x 3 x 3		53,580	386 4	6,011	Railway Department	Crushed dry on bed
Helidon Sandstone	Pearson .	Pink	2 26	141		3 x 3 x 3		65,280	467 0	7 334	Railway Department	Crushed dry on edge
Helidon Sandstone .	Pearson .	Pink .	2 26	141		6 x 3 x 3		56,100	406 4	6 322	Railway Department	Crushed dry on bed
Helidon Sandstone .	Pearson .	Pink ..	2 26	141	3 98	6 x 3 x 3		46,980	341 5	5,312	Railway Department	Crushed wet on bed
Helidon Sandstone	Pearson .	Pink ..	2 37	148	..	3 x 3 x 3	.	80,970	571 1	8,884	Railway Department	Crushed dry on bed
Helidon Sandstone	Pearson ..	Pink	2 37	148	..	3 x 3 x 3		79,180	560 2	8,714	Railway Department	Crushed dry on edge
Helidon Sandstone .	Pearson	Pink .	2 37	148	.	6 x 3 x 3		79,050	558·1	8,682	Railway Department	Crushed dry on bed
Helidon Sandstone ..	Pearson ..	Pink .	2 37	148	3 35	6 x 3 x 3		63,480	450 4	7,007	Railway Department	Crushed wet on bed
Helidon Sandstone	Pearson .	White ..	2 24	139	.	3 x 3 x 3		39,180	278 5	4,333	Railway Department	Crushed dry on bed
Helidon Sandstone	Pearson	White ..	2 24	139		3 x 3 x 3		55,650	397	6,175	Railway Department	Crushed dry on edge
Helidon Sandstone	Pearson	White ..	2 24	139		6 x 3 x 3		46,200	329	5,122	Railway Department	Crushed dry on bed
Helidon Sandstone ..	Pearson	White ..	2 24	139	3 44	6 x 3 x 3		29,870	214	3,329	Railway Department	Crushed wet on bed
Helidon Sandstone	Pearson ..	Brown .	2 26	141	..	3 x 3 x 3		43,030	304 9	4,743	Railway Department	Crushed dry on bed
Helidon Sandstone	Pearson	Brown	2 26	141		3 x 3 x 3		52,570	373 7	5,814	Railway Department	Crushed dry on edge
Helidon Sandstone	Pearson .	Brown	2 26	141		6 x 3 x 3		46,760	332 2	5,168	Railway Department	Crushed dry on bed
Helidon Sandstone	Pearson	Brown	2 26	141	4 20	6 x 3 x 3		27,210	197 7	2,997	Railway Department	Crushed wet on bed
Helidon Sandstone	Phippard	White	2 33	145		3 x 3 x 3		57,680	409 5	6,371	Railway Department	Crushed dry on bed
Helidon Sandstone	Phippard	White .	2 33	145		3 x 3 x 3		49,370	352 5	5,484	Railway Department	Crushed dry on edge
Helidon Sandstone	Phippard	White	2 33	145		6 x 3 x 3		50,760	360 7	5,612	Railway Department	Crushed dry on bed
Helidon Sandstone	Phippard .	White ..	2 33	145	2 73	6 x 3 x 3		32,780	231 8	3,606	Railway Department	Crushed wet on bed
Yangan Sandstone	Midson	Brown ..	2 18	136		4 x 4 x 4		40,560	163 0	2,535	Public Works Department	Executive Building tests, 1901
Yangan Sandstone .	Midson	Brown ..	2 18	136	8 7	4 x 4 x 4	.	43,120	173 2	2,695	Public Works Department	Executive Building tests, 1901
Yangan Sandstone	Midson	Brown .	2 18	136	..	4 x 4 x 4		50,610	203 3	3,163	Public Works Department	Executive Building tests, 1901
Murphy's Creek Sandstone	.	Brown .	2 41	150		4 x 4 x 4		52,470	210 9	3,280	Public Works Department	Executive Building tests, 1901
Murphy's Creek Sandstone	.	Brown ..	2 41	150		4 x 4 x 4	.	57,670	231 8	3,605	Public Works Department	Executive Building tests, 1901
Murphy's Creek Sandstone	..	Brown ..	2 41	150	5 0	4 x 4 x 4		59,400	238 7	3,712	Public Works Department	Executive Building tests, 1901
Calvert Sandstone .	Downs ..	Brown ..	..	.	..	3 x 3 x 3	.	45,760	327 3	5,085	R. Ferguson .	Tests conducted at Sydney Technical Colledge
Calvert Sandstone .	Downs .	Brown ..	..	.	..	3 x 3 x 3	.	45,510	325 1	5,057	R Ferguson ..	Tests conducted at Sydney Technical College
Calvert Sandstone .	Downs	Brown ..	..		.	3 x 3 x 3	.	32,890	234 8	3,654	R Ferguson	Tests conducted at Sydney Technical College
Calvert Sandstone .	Beatty and Walsh	Brown ..	2 39	149	4 47	.	.	.	240 6	3,733	Railway Department	Bremer Bridge test, 1896
Calvert Sandstone .	Beatty and Walsh	Brown ..	..	.	..	.		.	288 3	3,385	Railway Department	Bremer Bridge test, 1896
Murphy's Creek Sandstone	.	White ..	2 18	136	5 1	..	.	..	..	.	Railway Department	Brisbane Dry Dock tests, 1875
Murphy's Creek Sandstone	.	White ..	2 30	144	3 7	.	..	..	..	.	Railway Department	Brisbane Dry Dock tests, 1875
Moggill Sandstone	Lyons .	.	2·40	150	3 04	.	.	..	..	.	Railway Department	Brisbane Dry Dock tests, 1875
Moggill Sandstone .	Lyons	.	2 39	149 4	3 0			.	.	.	Railway Department	Brisbane Dry Dock tests, 1875
Moggill Sandstone .	Lyons .	..	2 30	143 75	3 8	..			..	..	Railway Department	Brisbane Dry Dock tests, 1875
Moggill Sandstone .	Lyons ..		2·48	153 75	2 07	..		.	..	..	Railway Department	Brisbane Dry Dock tests, 1875
Highfields Sandstone	..	White ..	..	..	4 8	.	..	..	..	.	W. Hamlet ..	Treasury Building Tests, 1888
Highfields Sandstone	.	White ..	..	..	7 0	..	..	..	..	.	W. H. Dixon ..	1886
Lockyer Creek Sandstone	.	..	2 45	153	3 7	..	..	..	..	..	Railway Department	Brisbane Dry Dock tests, 1875
Brisbane Tuff .	Spring Hill	..	2 16	135	7 2	..	..	..	..	..	..	Brisbane Dry Dock tests, 1875