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A Revised Glossary of Queensland Stratigraphy

(to and including 1943)

BY

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By W. H. Bryan, M.C., D.Sc., and O. A. Jones, M.Sc., Department of Geology, University of Queensland.

INTRODUCTION.

When the original Glossary of Queensland Stratigraphy was published in 1928, certain prefatory remarks appeared in the Introduction that it may be well to repeat here:

"The following glossary has been compiled in the hope that it may be of help to students of the geology of Queensland both within and without the State. That the nomenclature of Queensland Stratigraphy is in a chaotic condition is so well known to geologists as to be almost notorious. Such a condition, while it makes the investigation of stratigraphical problems difficult for those of us who live within the State, makes it almost impossible for those workers who are not familiar with the current use and interpretation of terms and who are thus forced to rely upon stratigraphical tables and geological maps that are hopelessly out of date. The author has endeavoured in a concise manner to define the original meaning, subsequent changes and present status of the many serial names which have been introduced into the geology of Queensland from time to time, and to trace their ever-changing mutual relationships.

"It is inevitable that our knowledge of the stratigraphical geology of an area as extensive as Queensland, based as it is on the patient work of a few investigators, will be built up not only slowly, but irregularly, in disjointed fashion. Many of the earlier names introduced tentatively and useful at the time may have to be jettisoned, others may have to be modified for use in a restricted sense, while still others may grow in importance as the scope of their application widens. Such changes are merely the consequences of added knowledge. They cannot be avoided. But there have been in the nomenclature of Queensland stratigraphy many other changes of an altogether different type. These are, in the first place, changes due to hasty correlations and immature generalisations extending as they do the geographical scope of serial names to embrace stratigraphical units which later investigations show to be quite distinct and of different geological ages. Then follow the more difficult changes involved in attempting to correct the mistakes that have been made. The position is rendered more complicated since the use of serial terms in a comprehensive manner may rest in part upon observed facts and in part upon personal opinion—and opinions differ. Thus at one and the same time two geologists may use the same serial name in somewhat different senses. It also follows that where they differ they will use different names for the same thing. As a result of these and many other minor reasons the serial nomenclature of Queensland geology has become involved, ambiguous and contradictory. Much of the confusion that results could be avoided and the position periodically clarified, if, at regular intervals, statements were drawn up by some official body such as the Geological Survey of Queensland showing: (*a*) The latest official interpretation of the geological record for the State; (*b*) The modifications therein of the preceding official statement; and (*c*) The reasons for those modifications."

The foregoing remarks showed how matters stood in 1928. At that time it was hoped that the appearance of the Glossary would be shortly followed by

the publication of the Geological Map of Queensland then being prepared by Mr. B. Dunstan and his officers of the Geological Survey of Queensland. Such an event would have been most timely, for the map would have supplied "the latest official interpretation of the geological record for the State" that was so urgently needed. In anticipation of this happy event the numerous serial names used on the manuscript map were, with the kind permission of the Chief Geologist, included in the Glossary. Most unfortunately the map was not published at the time, neither has it appeared in the intervening fifteen years. But we find from the Annual Report of the Department of Mines for 1930 that "During the year 1930, under Mr. Dunstan's direction and supervision and with the co-operation of the full staff, a revision of the 1905 Geological Map of the State was begun by Mr. J. H. Reid. This was undertaken at the special request and with the active collaboration of Professor Sir T. W. E. David, to whom it was passed over for adjustment with the maps of the other State surveys." In his annual report for the following year Mr. Ball stated that "The Geological Map of Queensland, prepared several years ago as a revision of the 1905 map, has not yet been published, but it has been incorporated to a very great extent in the Geological Map of Australia, prepared by Sir T. W. E. David and published by the Commonwealth Council for Scientific and Industrial Research, during 1932."

This well-known and admirable map, together with the accompanying Explanatory Notes, has been of the greatest use in the preparation of the Revised Glossary. Nevertheless it cannot fully take the place of the State map as originally planned by the Geological Survey of Queensland. Excellent as it is as a geological map of the continent, it may be regarded as only a summary of the geology of the State, and only a semi-official summary at that. A more detailed geological map of Queensland, on a larger scale and with full official sanction as to its serial nomenclature, is still an urgent need.

Since the publication of the original Glossary in 1928 a great deal has been written bearing more or less directly on the stratigraphy of Queensland. It is most satisfactory to record that in a considerable number of these later works the stratigraphy is of a far more disciplined and precise order than had previously been attempted.

The glossary now presented has been constructed on the same general principles as its predecessor with, however, some minor modifications. It includes, to the best of our knowledge, all important stratigraphical material to the end of 1943. It has been our endeavour throughout to adopt a thoroughly impersonal, objective attitude, uninfluenced by our own personal opinions and prejudices. In those, relatively few, instances where a personal comment has seemed helpful, we have been careful to differentiate it sharply from the body of the text by confining it in square brackets. The items constituting the glossary are printed in black-face capitals. Each item is based on a serial name, the great majority of which have been used, as such, in Queensland stratigraphy. A few are put forward formally for the first time. Where several closely similar terms have been used for the one series, we have selected that which appears the most appropriate, the others being incorporated in the text in capitals. Following each item will be found the name of the authority who first used the term (or whose work was most closely associated with the series), together with the year in which the serial name first appeared in print.*

* Some discrepancies may be noted between some of these dates of publication and those appearing for the same item in the original Glossary. This is due to the policy now adopted of using the year of publication of the *volume* in which the reference occurs. In some cases, as, for example, in the Proceedings of the Royal Society of Queensland and those of the Australasian Association for the Advancement of Science the volumes were published a year or more after preprints of the individual papers had appeared.

In the short definition which next appears we have, where practicable, followed the original authority verbatim. In all cases we have endeavoured to define the term in the sense of that authority as gathered from his original description, but in a few instances it has been found necessary to supplement this from his later (more detailed) work.

Following the definition will be found a very condensed history of the varying meanings assigned to the term and the consequent changes in its correlation with cognate series. With regard to the latter, the conclusions only are stated, not the arguments on which these conclusions are based, unless they are very simple and direct. (In many cases they are, in fact, indirect, involved, and tortuous.)

Within some items are included those personal interpolations, annotations and recommendations which appear helpful.

At the foot of each item will be found some of the more important references to the relevant literature.

The Revised Glossary will be found to differ from the original both in content and format. The chief differences are (1) many new items have been introduced, (2) information has been added to many of the original items, (3) some inadvertent omissions have been rectified, (4) certain corrections have been made and (5) a considerable number of items have been omitted. Of these last some have been rejected because they are not strictly stratigraphical and others because they were based on unpublished information. The two appendices in the original glossary which dealt respectively with the Queensland geological record and the principal coal horizons have also been omitted. It is hoped that these and similar tables will be included in a companion work, now in the course of preparation, which we intend to publish under the title, "An Outline of Queensland Stratigraphy."

W. H. BRYAN.
O. A. JONES.

Department of Geology,
University of Queensland,
February 8th, 1944.

LIST OF ABBREVIATIONS.

The following abbreviations have been used in the references to literature:—

A.A.A.S.	Australasian Association for the Advancement of Science.
A.N.Z.A.A.S.	Australian and New Zealand Association for the Advancement of Science.
A.G. & G.S. of N.A. ..	Aerial Geological and Geophysical Survey of Northern Australia.
B.A.A.S.	Federal Handbook for 1914 Meeting, British Association for the Advancement of Science.
Explanatory Notes ..	Explanatory Notes to accompany a New Geological Map of the Commonwealth of Australia. Based on the maps already published by the Geological Surveys of the various States, etc., by T. W. E. David, Australasian Medical Publishing Company, Ltd., Sydney, 1932.
Geol. of Qld.	Geology and Palaeontology of Queensland by R. L. Jack and R. Etheridge, Government Printer, Brisbane, 1892.
P.R.S.Q.	Proceedings of the Royal Society of Queensland.
Qld. Hbk.	Handbook for Queensland, A.A.A.S., Brisbane, 1930.
Qld. Min. Index ..	Queensland Mineral Index by B. Dunstan, Q.G.S. P. No. 241, 1913.
Q.G.M.J.	Queensland Government Mining Journal.
Q.G.S.P.	Queensland Geological Survey Publication.
Q.J.G.S.	Quarterly Journal of the Geological Society of London.
P.R.S.N.S.W.	Proceedings of the Royal Society of New South Wales.

A

ABERDARE CONGLOMERATE (Cameron, 1922).—

The bed of conglomerate lying above the Aberdare seam and forming the uppermost horizon of the Ipswich Series in the type area.

Whitehouse (1930) suggested that it "may really be a basal conglomerate of the Bundamba Sandstone."

W. E. Cameron in J. H. Reid and C. C. Morton: Q.G.M.J., 1922, map on p. 358.

W. E. Cameron: Q.G.S.P. No. 271, 1923.

F. W. Whitehouse: Qld. Hbk., A.A.A.S. 1930, p. 35.

ABERDARE SHALES (Cameron, 1907).—

A bed of shales about 100 feet thick in the uppermost part of the Ipswich Series, containing two persistent seams of coal, one near the bottom known as the Bluff seam, one near the top known as the Aberdare seam.

W. E. Cameron: Q.G.S.P. No. 204, 1907, p. 21.

ACID TUFF STAGE (Hill, 1930).—

Placed within the Esk Series above the Andesitic Boulder Beds and below the Esk Shales and correlated with the Brisbane Tuff.

D. Hill: P.R.S.Q., 41, 1930, pp. 169, 186.

ACTINOCEROID ZONE (Kobayashi, 1940).—

Lower of his two zones of the Toko Series.

T. Kobayashi: Jap. Jour. Geol. and Geog., 17, 1940, p. 124.

AGNOSTUS SEMINULA STAGE (Whitehouse, 1939).—

A stage correlated with the *Paradoxides hicksi* zone of the Middle Cambrian of Europe, inserted at the base of the Georgina Series, below the *Phoidagnostus* Stage. It lies stratigraphically immediately above the *Dinesus* Stage of the Templeton Series.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1939, pp. 264-5.

ALCURAH COAL MEASURES (David, 1932).—

Beds below the Cornwall Coal Measures but high in the Walloon Series (in the broad sense) occurring in the Roma district, and assigned to the Upper Jurassic.

See Orallo Measures.

T. W. E. David: Explanatory Notes, 1932, Table G, and p. 126.

ALDEBARAN SANDSTONES (Reid, 1930).—

A stage of massive sandstones and conglomerates probably of fresh water origin occurring within the Lower Bowen Series as developed in the Springsure district.

J. H. Reid: Q.G.M.J., 1930, p. 96.

ALLUVIAL AND BEACH DEPOSITS (Dunstan, 1916).—

Recent surface deposits containing gold, tin, sapphires, monazite, etc. The most recent of Dunstan's Quaternary Series.

B. Dunstan, Harrap's Geography, 1916, p. 164.

ALLUVIAL DEPOSITS (Dunstan, 1916).—

Used in two senses: (1) Deposits in old river channels sometimes containing tin, gold, or sapphires, listed as Tertiary. (2) Old surface accumulations of gold, tin, sapphires, etc. The Bone Drifts of the Darling Downs containing *Diprotodon*, etc. One of the series assigned by Dunstan to the Quaternary.

See *Diprotodon* Beds.

B. Dunstan, Harrap's Geography, 1916, p. 164.

ALLUVIAL, OLDER (Gregory, 1879).—

Deposits restricted to the valleys descending westerly from the Main Divide. "This alluvium is remarkably rich in fragments of bones of extinct animals including *Diprotodon*."

See *Diprotodon* Beds.

A. C. Gregory: Qld. Parliamentary Papers, 1879.

AMAMOOR SERIES (Dunstan, 1916).—

Slates, schists, quartzites, and jasperoids occurring at Black Snake, Marodian, Amamoor, Kandanga, and Mount Walli. Correlated with the Brisbane Schists and with the Gladstone-Curtis Island Series and assigned to the ? Ordovician.

B. Dunstan: Harrap's Geography, 1916, p. 174.

AMMONITOCERATAN STAGE (Whitehouse, 1927).—

The uppermost of the four (Aptian) stages into which his Roma Series is divided. It follows the Tropaeuman Stage.

David (1932) placed the AMMONITOCERAS STAGE as the uppermost of his *five* stages within the Aptian.

F. W. Whitehouse: Q.G.M.J., 1927, p. 145; A.A.A.S. 18, 1928, p. 276.

T. W. E. David: Explanatory Notes, 1932, Table H.

AMPHOTON STAGE (Whitehouse, 1936).—

One of the four stages into which he divided the Templeton Series. It is immediately above the *Redlichia* Stage and below the *Inouyella* Stage and is correlated with the *Paradoxides oelandicus* zone of the Middle Cambrian of Europe. It forms also the lowest of the three stages of his *Kootenia* Group.

Whitehouse (1941) stated that "*Amphoton* occurs at intervals through a very large part of the Middle Cambrian and seems to have mainly a facies significance." The *Amphoton* Stage was therefore superseded by his more comprehensive *Xystridura* Zone.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, pp. 73, 74, 78; 11, 1939, pp. 264-5; 12, 1941, p. 2.

AMYGDALOPHYLLUM LIMESTONE (Whitehouse, 1928).—

Synonym for Lion Creek Limestone (Whitehouse, 1927).

F. W. Whitehouse: Q.G.M.J., 1928, p. 441; Qld. Hbk. A.A.A.S., 1930, p. 30.

AMYGDALOPHYLLUM-LITHOSTROTION HORIZON (Reid, 1930).—

An oolitic limestone horizon regarded by Reid as the upper limit of the Rockhampton Series.

See Lion Creek Limestone.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 30.

ANAKIE SERIES (Jensen, 1926).—

A term to include all the rocks older than the Star Series in the Clermont-Springsure area.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 149.

ANCYLOCERATAN STAGE (Whitehouse, 1927).—

The lowest of the four (Aptian) stages into which his Roma Series is divided. It is succeeded by the *Australiceratan* Stage.

David (1932) placed the "ANCYLOCERAS STAGE" above his *Coilotis* Stage, both within the Aptian.

F. W. Whitehouse: Q.G.M.J., 1927, p. 145; A.A.A.S. 18, 1929, p. 276.

T. W. E. David: Explanatory Notes, 1932, Table H.

ANDESITIC STAGE (Reid and Morton, 1923).—

The lowest division of the Esk Series. Referred to also as the Volcanic Stage.

Hill (1930) used the term ANDESITIC BOULDER BEDS for this stage.

J. H. Reid and C. C. Morton: Q.G.M.J., 1923, p. 7.

D. Hill: P.R.S.Q., 41, 1930, p. 169.

ANEIMITES BEDS (Reid, 1930).—

Synonym for Silver Valley (Newellton) Beds.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 25.

ANOMOCARE STAGE (Whitehouse, 1936).—

One of the six stages of the Georgina Limestones. It lies immediately above the (lowest) *Phoidagnostus* Stage and below the *Solenopleura* Stage, and was correlated with the *Paradoxides forschanneri* zone of the Middle Cambrian of Europe. It forms also the middle of the three stages of his *Phalacroma* Group.

Whitehouse (1931) had divided the series into three stages which did not include this. Whitehouse (1939) showed it as immediately above a (new) *Papyriaspis* Stage and below a *Eugonocare* [*Anorina*] Stage, the *Solenopleura* Stage having been deleted.

F. W. Whitehouse: Ann. Rept. Dept. Mines Qld. for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, pp. 75, 78, 11, 1939, pp. 264-5.

ANORINA STAGE (Whitehouse, 1936).—

One of the six stages into which he divided the Georgina Limestones of Cambrian age. It lies immediately above the *Solenopleura* Stage and below the *Glyptagnostus* Stage, and was correlated with the *Agnostus pisiformis* zone of the Middle Cambrian of Europe.

Whitehouse (1931) had previously divided the series into three stages which did not include this. Whitehouse (1939) replaced the name by *Eugonocare* Stage. As a result of the deletion of the *Solenopleura* Stage, this was shown as immediately above the *Anomocare* Stage.

F. W. Whitehouse: Ann. Rept. Dept. Mines Qld. for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, p. 78; 11, 1939, pp. 264-5.

ANTHRACITIC SERIES (Dunstan, 1901).—

Coal measures of the Dawson-Mackenzie area constituting the Lower Fresh-Water Series of his Lower Bowen.

B. Dunstan: Q.G.S.P., No. 155, 1901, p. 23.

APIS CREEK SERIES (Daintree, 1870).—

Shales, sandstones and sandy limestones near Marlborough placed stratigraphically above his Rockhampton Series and below his Mt. Wyatt Series. Assigned to the Middle Devonian.

R. Daintree: General Report on the Northern District, p. 6, Qld. Parl. Papers, 1870.

ARGYLLA SERIES (David, 1932).—

Hornblende and chlorite schists assigned to the Archaeozoic era and separated by a massive conglomerate from the Leichhardt-Kalkadoon Series below.

Honman (1936) included it in his comprehensive Kalkadoon-Argylla Series of older Archaeozoic age. See Cloncurry Series.

T. W. E. David: Explanatory Notes, 1932, p. 31.

C. S. Honman: A.G. & G.S. of N.A. Rept., Dec., 1935, 1936, p. 49.

ARTESIAN BEDS (Dunstan, 1920).—

A series of regularly-bedded rocks of Jurassic age to the north-east and south-west of the Cloncurry mineral belt on which they rest.

[These Artesian Beds embrace beside Jurassic strata representatives of several other series. Hence the term has lost its stratigraphical significance.]

B. Dunstan: Q.G.S.P., No. 265, 1920, p. 14.

ARTESIAN INTAKE LIMESTONE (Dunstan, 1920).—

Shown in geological section from Boulia to Camooweal to Burketown. Assigned to the Jurassic period and regarded as part of the Artesian Beds.

[This limestone is now regarded as being in part Cambrian (see Templeton Series, Georgina Series) and in part Tertiary (see Limestones (Tertiary.))]

B. Dunstan: Q.G.S.P., No. 265, 1920, pl. 4.

ASAPHID ZONE (Kobayashi, 1940).—

Upper of his two zones of the Toko Series.

T. Kobayashi: Jap. Jour. Geol. & Geog., 17, 1940, p. 124.

ASTARTILA HORIZON (Reid, 1929).—

An horizon of local value within the Middle Bowen Series consisting of a sandstone bed, crowded with *Astartila* and 25 to 30 feet above the Garrick Seam.

J. H. Reid: Q.G.S.P., No. 276, 1929, p. 69.

ATTICA SERIES (Whitehouse, 1940).—

A local serial name for very friable sandstones that seldom outcrop, the surface being a mass of deep, loose, white sand, occurring as a marginal fringe to the Great Artesian Basin. It lies conformably below the Cunno Series and conformably above the Dooloogarah Series.

Whitehouse (1942) stated that this is equivalent to, and consequently absorbed in, the "standard" Marburg Series.

F. W. Whitehouse: Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 16; P.R.S.Q., 53, 1942, p. 13.

AUSTRALICERATAN STAGE (Whitehouse, 1927).—

The stage above the Ancyloceratan and below the Tropaeuman Stage, being the second in ascending order of the four Aptian stages into which he divided his Roma Series.

David (1932) placed the AUSTRALICERAS STAGE as the third within the Aptian.

F. W. Whitehouse: Q.G.M.J., 1927, p. 145; A.A.A.S. 18, 1928, p. 276.

T. W. E. David: Explanatory Notes, 1932, Table H.

B

BAFFLE CREEK TERTIARIES (Ball, 1915).—

A series of fresh-water sediments including oil shales with ostracods and dicotyledons correlated tentatively with the Oxley Beds and assigned to the Tertiary.

David (1932) placed them in the Oligocene. See Lowmead Tertiaries.

L. C. Ball: Q.G.S.P., No. 249, 1915, p. 8.

T. W. E. David: Explanatory Notes, 1932, Table I.

BALD HILLS, PETRIE, REDCLIFFE BEDS (Jones, 1927).—

Comprehensive name for Tertiary deposits north and east of Brisbane. See Petrie Series.

O. A. Jones: P.R.S.Q., 38, 1927, p. 25.

BALD MOUNTAIN JASPERS (Richards and Bryan, 1928).—

Jaspers, in part Radiolarian, in the Silverwood area placed in the Lower Devonian, underlying the Middle Devonian Silverwood Series and correlated with similar beds at Pine Mountain and Broadmount.

David (1932) also placed these in the Lower Devonian.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

T. W. E. David: Explanatory Notes, 1932, Table C.

BARKLY SERIES (Dunstan, 1913).—

The limestones (in part) of the Barkly Tableland. Listed and mapped as Tertiary.

Whitehouse (1940) stated, "Since there are limestones of so many ages in this region and no one of these particularly was specified, Dunstan's name should be allowed to lapse."

[Not to be confused with Jensen's Barkly Tableland Series.]

B. Dunstan: Qld. Min. Index, 1913, pl. 21; Harrap's Geography, 1916, p. 164.

F. W. Whitehouse: Univ. of Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 27.

BARKLY TABLELAND SERIES (Jensen, 1919).—

Certain limestones of the Barkly Tableland assigned to the Cambrian.

Clarke (1878) on the evidence of trilobites had considered that rocks of Devonian age existed in the area.

This term became obsolete as a result of Whitehouse's (1936, 1940) inclusion of these limestones in his Templeton Series and Georgina Series.

W. B. Clarke: Remarks on the Sedimentary Formation of New South Wales, 4th Ed., 1878, p. 95.

H. I. Jensen: Roy. Geog. Soc. Qld., 1919, p. 111; Pan-Pacific Congress, 1923, p. 1262.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, pp. 65, 66; Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 47.

BARRON RIVER SERIES (Whitehouse, 1930).—

"A great thickness of phyllites, clay slates, quartzites and chlorite schists very similar in rock types to the Brisbane Schist Formation" and more metamorphosed than the (Silurian) Chillagoe Series.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 27.

BASAL CONGLOMERATES (Cameron, 1899).—

The lower division of the Ipswich Series.

The Ipswich Series has since been subdivided in other ways, but this horizon has retained its place and name.

W. E. Cameron: Q.G.S.P., No. 147, 1899, p. 3.

BEACH DEPOSITS.—

See Alluvial and Beach Deposits.

BEAUDESERT TERTIARY (Jones, 1927).—

Tertiary strata on the Logan River near Beaudesert, discovered in 1924.

David (1932) assigned these beds to the Oligocene. Chapman (1935) stated that the ostracods indicate "a shallow marine or estuarine origin," and that in age they may range from "Lower Miocene, or even older, to Pliocene."

O. A. Jones: P.R.S.Q., 38, 1927, p. 45.

T. W. E. David: Explanatory Notes, 1932, Table I.

F. Chapman: P.R.S.Q., 46, 1935, p. 70.

BEAUDESERT (WALLOON) COAL MEASURES (Marks, 1910).—

Local name for coal measures of the Walloon Series in the neighbourhood of Beaudesert.

E. O. Marks: Q.G.S.P., No. 225, 1910, p. 38.

BELLEVUE CONGLOMERATES (Reid and Morton, 1923).—

Equivalent to the Esk Shales and forming their middle division of the Esk Series.

Hill (1930) regarded them and the equivalent Esk Shales as the uppermost stage of the series. She correlated them with the Basal Ipswich Conglomerates.

J. H. Reid and C. C. Morton: Q.G.M.J., 1923, p. 7.

D. Hill: P.R.S.Q., 41, 1930, p. 186.

BERSERKER-CAWARRAL BEDS (Jensen, 1926).—

One of five localities in Central Queensland listed as containing Middle Carboniferous marine sediments.

See Cawarral-Rockhampton Beds.

H. I. Jensen: Q.G.M.J., 1925, p. 422.

BERSERKER SERIES (Whitehouse, 1930).—

Andesitic tuffs and interbedded limestones, assigned to the Devonian and lying conformably above the Etna Series also of Devonian age.

David (1932, Table C) assigned this series to the Upper Devonian but (on p. 51) treated it as Middle Devonian. [In the latter statement "Berserker" is probably an error for "Etna," a Middle Devonian series in the same district.]

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 29.

T. W. E. David: Explanatory Notes, 1932, Table C, p. 51.

BETT'S CREEK SERIES (Reid, 1916).—

Fresh-water conglomerates, sandstones and white shales containing *Taeniopteris, Glossopteris,* etc., lying unconformably on lower Palaeozoic rocks and with a slight unconformity under Desert Sandstone. He correlated it with the Galah Gorge Beds and assigned both to the Permo-Carboniferous.

Whitehouse (1940) assigned it to the late Permian or early Triassic and regarded it as included in his Dooloogarah Series.

J. H. Reid: Q.G.S.P., No. 254, 1916, pp. 11, 16, 17.

F. W. Whitehouse: Univ. Qld. Papers, Geol. Dept., 2 (n.s.), No. 1, 1940, p. 61.

BIG SANDSTONE (Jensen, 1926).—

An important horizon in the Walloon Series as developed north of Roma.

Jensen (1929) placed his "BIG SANDSTONE SERIES" at the base of his Middle Walloon, and regarded it as a persistent horizon in the Roma district. He subdivided it into two sandstone stages—an upper, Bymount Stage, and a lower, Gunnewin Stage, separated by an unnamed limey shale stage.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 25; Q.G.M.J., 1929, pp. 282, 283.

BIG STROPHALOSIA HORIZON (Reid, 1929).—

A bed of sandstone closely associated with glacial beds, 50 to 90 feet thick, "packed with *Strophalosia clarkei*" occurring within the Middle Bowen Series as developed in the type area. "The one drawback to it as an index bed, where it may be only partially exposed, is the fact that there are other Strophalosia beds, several of which have a thickness of 15 feet to 20 feet."

Reid (1930) correlated it with similar horizons at Mt. Britton and Logan Downs. David (1932) showed these "STROPHALOSIA CLARKEI BEDS" high in the Middle Bowen and high in the Middle Permian.

J. H. Reid: Q.G.S.P., No. 276, 1929, p. 67; Q.G.S.P., No. 278, 1930, table opposite p. 76.

T. W. E. David: Explanatory Notes, 1932, Table E.

BILLY SERIES (Dunstan, 1916).—

Surface-formed quartzite, generally associated with basalt flows. Usually occurs as boulders as at Anakie, Clermont, Darling Downs, Western Queensland. Listed as Tertiary.

Whitehouse (1940) pointed out that two types of quartzite had been included under the name, one formed by the metamorphism of sandstones by basalts and another by a modification of laterites. The second type may have some stratigraphical significance.

B. Dunstan: Q.G.S.P., No. 148, 1900, p. 5; Harrap's Geography, 1916, p. 165.

F. W. Whitehouse: Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 13.

BLACKALL MARINE BEDS (Reid and Morton, 1928).—

Placed in the Cretaceous and shown as overlying the Walloon Series.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 388.

BLACK SNAKE (Daintree, 1872).—

One of the ten areas assigned by him to his oldest or "Metamorphic" group of Pre-Devonian age.

This area was later included in the Gympie Series (in its most comprehensive sense) by Jack and Etheridge (1892); Dunstan (1916) regarded it as part of his Amamoor Series.

R. Daintree: Q.J.G.S., 1872, p. 300.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 97.

B. Dunstan: Harrap's Geography, 1916, p. 174.

BLAIR ATHOL (COAL) SERIES (Reid, 1936).—

Fresh-water sandstones and conglomerates with coal seams occurring in the Clermont district and assigned to the Permo-Carboniferous.

This series was previously included in the Clermont-Tolmies-St. Mary Series (Dunstan, 1913).

J. H. Reid: Q.G.M.J., 1936, pp. 228, 340.

BLYTHESDALE BRAYSTONE (Jack, 1895).—

A series of soft, grey, very friable and very porous sandstones, grits and conglomerates well developed at Blythesdale near Roma and extending all along the eastern limit of the Cretaceous sea and forming the base of the Rolling Downs Formation. The Blythesdale Braystone formed the supposed intake beds of the Great Artesian Basin.

It is clear from his section that Jack (1895) regarded the Blythesdale Braystone as forming the base of the Rolling Downs Formation. Rands (1901), however, while still assigning the Blythesdale Braystone to the Lower Cretaceous, placed it as a separate series *below* the Rolling Downs Formation. Dunstan (1905) in his Geological Map of Queensland, and again in his Mineral Index (1913), followed Rands. But Saint-Smith (1914) reverted to Jack's interpretation, although he thought them less extensive and important than did Jack and minimised their value as intake beds. Dunstan (1916) stated that "The Rolling Downs Marine Series included the Blythesdale Braystone, but on the same page of the same publication he stated that the Walloon Series absorbed it all. Jensen (1925) regarded the Blythesdale Braystone as part of his Upper Walloon Beds but as Lower Cretaceous in age. Ball's (1927) "Transition Beds" between the Walloon Series and the Rolling Downs Formation included the original Blythesdale Braystone horizon. Reid (1929) stated that the Geological Survey of Queensland had abandoned the term as having no stratigraphical significance. David (1932) placed it within the upper part of the Walloon Series and conformably over the Orallo Coal Measures and assigned it tentatively to the Lower Cretaceous. Whitehouse (1940) assigned the "BLYTHESDALE SERIES" to the late Jurassic or early Cretaceous. Whitehouse (1942) described it in the Alice Tableland area as above the Walloon Series (late Jurassic) and below the Tambo Series (Cretaceous).

R. L. Jack: Q.G.S. Bull., No. 1, 1895, pp. 6 and 12; Trans. Vict. Inst., 1902, p. 5.

W. H. Rands: Qld. Year Book, 1901, pp. 246 and 251.

B. Dunstan: Geol. Map. Qld., 1905; Qld. Min. Index, 1913, pl. 0; Harrap's Geography, 1916, p. 166.

E. C. Saint-Smith: Artesian Water Conference, 1914, p. 20.

H. I. Jensen: Q.G.M.J., 1925, p. 460.

L. C. Ball: Q.G.M.J., 1927, p. 94.

J. H. Reid: Rept. Fifth Artesian Water Conference, 1929, p. 30.

T. W. E. David: Explanatory Notes, 1932, Table H.

F. W. Whitehouse: Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, pp. 6, 57; P.R.S.Q., 53, 1942, p. 14.

BOGANTUNGAN AND DRUMMOND BEDS (Jensen, 1921).—

Synonym for Drummond Series.

H. I. Jensen: Q.G.M.J., 1921, p. 405.

BONE DRIFTS (Jack and Etheridge, 1892).—

Term used for one of the several Post-Pliocene "Formations."

See *Diprotodon* Beds.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

BORALLON SERIES (Reid and Morton, 1922).—

A term used to cover a relatively narrow strip of steeply dipping sandstones, conglomerates, and shales stretching from West Ipswich in a northerly direction past Fernvale for about 36 miles. The series as defined embraced strata which had previously been included in the Ipswich Series, Esk Series and Bundamba Series. The Borallon Series was stated to be of "Lower Trias" age and to lie unconformably beneath the Ipswich Series of "Upper Trias" age.

The validity of the Borallon Series was questioned by Marks, and by Cameron, with the result that a controversy was carried on in the pages of the "Queensland Government Mining Journal." As the result of this and of further field work, Reid and Morton decided in 1924 to withdraw completely their interpretation and to revert to that of Cameron. Notwithstanding this decision Jensen, in 1926, correlated his Clematis Sandstone of the Carnarvon Range area with the then obsolete Borallon Series.

B. Dunstan: Q.G.S.P., No. 272, 1922, Introduction.

J. H. Reid and C. C. Morton: Q.G.M.J., 1922, pp. 358, 390; 1923, pp. 7, 167, 249, 423; 1924, p. 282.

J. H. Reid: Q.G.M.J., 1922, p. 463.

E. O. Marks: Q.G.M.J., 1922, p. 478; 1923, pp. 208, 422.

W. E. Cameron: Q.G.M.J., 1923, p. 166.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 22.

BOWEN SERIES (Daintree, 1872; Etheridge, Senr., 1872).—

Synonyms common in literature are: BOWEN RIVER SERIES, BOWEN RIVER COALFIELD SERIES (Etheridge, Junr., 1880), BOWEN RIVER FORMATION (Jack and Etheridge, 1892), BOWEN BEDS (Dunstan, 1901), BOWEN FORMATION (Dunstan, 1905).

One of the most extensive and important coal-fields in Queensland is embraced by this term. The subdivision of the series and its correlation with other series have produced many diverse views, the more important of which are as follows:—

Clarke (1862) had assigned it to an Upper Palaeozoic age in spite of McCoy's view that the coal-fields of Australia were to be regarded as Mesozoic. Daintree (1872) and Etheridge, Senr. (1872), assigned the series to the uppermost part of the Carboniferous in their stratigraphical table of Queensland formations, and in the accompanying Geoglogical Map of Queensland. A Brisbane edition (1872) of Daintree's map by an unfortunate mistake showed the series as Mesozoic. Smyth (1873) in his Geological Map of Australia showed the series as "Carbonaceous" (a term then in use for the Mesozoic Coal Measures of Australia). Jack (1879) produced his classical work on the Bowen River Coalfield in which the whole series was assigned to the Carboniferous, and the following subdivisions were made:—

Upper Series (essentially fresh water).

Middle Series (essentially marine).

Interbedded lavas and tuffs.

Lower Series (with volcanic agglomerate at base).

Etheridge, Junr. (1880) described fossils from the Bowen River Coalfield which he regarded as occupying a high position in the Palaeozoic and for the age of which he suggested the term ''Permo-Carboniferous'' *q.v.* Jack (1889) agreed with Etheridge's conclusions, but used the term ''Carbonifero-Permian.'' Jack and Etheridge (1892) divided the series into three Formations, called the Upper, Middle and Lower Bowen respectively, and extended the geographical significance of the term Bowen by including beds outside the type area. Dunstan (1901) abandoned Jack's (1879) tripartite arrangement and grouped the ''BOWEN BEDS'' into two divisions, namely Upper and Lower Bowen, the latter of which he further subdivided into Upper Freshwater, Upper Marine, Lower Freshwater and Lower Marine and Volcanic Series. (This classification was not based on work in the type area, but in the Dawson-Mackenzie area). Dunstan (1905) reverted to Jack's three-fold division for the type area, but retained his (Dunstan's 1901) modifications as a provisional classification for use in the Clermont, Tolmies, Dawson and Mackenzie areas. Dunstan (1913) returned to his two-fold division into an Upper Bowen (Freshwater-Marine) Series and a Lower Bowen (Freshwater-Marine-Volcanic) Series. Dunstan (1916) abandoned the term Bowen Series and included all the Bowen marine formations in a very comprehensive Upper Marine Series, the coal measures being placed partly on a higher horizon in his Upper Coal Measures, and partly on a lower horizon in his Lower Coal Measures. Jensen (1926) used Jack's three-fold scheme and his nomenclature, but in a different sense, removing from Jack's ''Middle (essentially marine) Series'' the upper limestone into the base of his (Jensen's) Upper Bowen, and the lower limestone into the top of his Lower Bowen, thus converting the Middle Bowen into an essentially fresh-water series. He referred his Upper Bowen to Permian, his Middle Bowen to Lower Permain to Uralian, and his Lower Bowen to Upper Carboniferous. Reid (1924, 1929) followed Jack's arrangement with some slight modifications, viz.: (1) The inclusion of both the interbedded lavas and basal agglomerates in the Lower Bowen, and (2) the subdivision of the Middle Bowen into a lower portion, the Collinsville Coal Measures, and an upper portion, the Marine Series. Reid (1930a) divided the Lower Bowen Series as developed in the Springsure district into the following stages in ascending order: Staircase Sandstones, Gypseous Marine Stage, Aldebaran Sandstones, Coral Stage, Catherine Sandstones, Dilly Marine Stage, and Serocold Sandstones. Reid (1930b) assigned the Lower Bowen to ''Late Upper Carboniferous to Lower Permain,'' and the Middle and Upper Bowen to the Permain. David (1932) placed the Lower Bowen in the Lower Permain, the Middle Bowen as partly Lower and partly Middle Permain while the Upper Bowen corresponded with the Upper Permain.

W. B. Clarke: Q.J.G.S., 1862, p. 244.

R. Daintree: Q.J.G.S., 1872, p. 325.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

R. Brough Smyth: Victorian Government, 1873.

R. L. Jack: Q.G.S.P., No. 4, 1879, p. 4; A.A.A.S., 1, 1889, p. 201.

R. Etheridge, Junr.: Roy. Phys. Soc. Edin., 1880, p 57.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

B. Dunstan: Q.G.S.P., No. 155, 1901, p. 23; Geol. Map. of Qld., 1905; Qld. Min. Index, 1913, pl. 0; Harrap's Geography, 1916, p. 169.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 22.

J. H. Reid: Q.G.M.J., 1924, p. 450; also published as Q.G.S.P., No. 276, 1929.

J. H. Reid: Q.G.M.J., 1930a, p. 91; Q.G.S.P., No. 278, 1930b, p. 92.

T. W. E. David: Explanatory Notes, 1932, Table E.

BOYNE RIVER LIMESTONE (Ball, 1904).—

Limestone, in part fossiliferous, assigned to the Devonian.

Richards and Bryan (1928) placed it in the Middle Devonian and equated it with the limestones of Silverwood, Pine Mountain, Marmor, and Cawarral.

L. C. Ball: Q.G.S.P., No. 104, p. 34, and map 16.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

BREAKFAST CREEK SANDSTONE (Richards, 1919).—

A friable coarse sandstone near the base of the Ipswich Series as developed at Albion, near Brisbane, and once used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 117.

BRISBANE PORPHYRY (Wilson, 1856).—

Name given to what is now known as Brisbane Tuff.

J. S. Wilson: Q.J.G.S., 1856, p. 283.

BRISBANE SCHISTS.—

A series made up of an immense thickness of more or less altered sediments, tuffs and lavas, occupying a comparatively narrow belt on the south coast of Queensland.

At various times they have been referred to the following ages:—Daintree (1872) placed most of the strata now included under the term Brisbane Schists in the Devonian. Clarke (1878) considered the BRISBANE SLATES tentatively as Silurian. Gregory (1879) regarded the whole series as of Devonian age. Rands (1887), under the caption "Metamorphic," described them as micaceous and quartzose schists and stated that "the series belongs probably to the Silurian or to even an older formation." Jack (1892) mapped the Brisbane Schists as part of his Gympie Series of Permo-Carboniferous age. Jensen (1912) regarded them as constituting several series ranging perhaps from Pre-Cambrian to Carboniferous. Wearne (1912) suggested a Pre-Cambrian age for the series. Dunstan (1913) referred to them as the "BRISBANE SERIES" and placed them in the Devonian. David (1914) suggested that certain glaucophane schists supposedly within the series were of Archean age. Dunstan (1916) referred the series doubtfully to the Ordovician. Richards (1922) followed David in assigning the series to the Ordovician. Saint-Smith (1923) suggested the possibility of a Pre-Cambrian age. Richards and Bryan (1925) advocated the following subdivisions and respective ages:—Phosphate Schists, Ordovician; Manganiferous Schists, ? Silurian; Radiolarian Jaspers, Lower Devonian; Serpentines, Upper Devonian. Bryan (1926) argued that the lower part of the series was Silurian and that the upper part which conformably overlay it was Devonian. Denmead (1928) made a careful survey of the Brisbane Schists which added very greatly to our knowledge of them. In spite of the great variety of rock types represented in the series, he recognised four well-marked divisions which he named in ascending order: (1) Greenstone Series, (2) Bunya Series, (3) Neranleigh Series, (4) Fernvale Series. While not arriving at any definite opinion with regard to the age, he followed Bryan in referring the upper part of the series tentatively to the Devonian and the lower part tentatively to the Silurian. Whitehouse (1930) suggested that the Greenstone Series may be in part Pre-Ordovician, the Bunya Series Upper Ordovician, the Neranleigh Series Silurian and the Fernvale Series Lower Devonian. David (1932) made the following tentative estimates of the respective ages:—Greenstone Series, Newer Proterozoic (but possibly Cambrian or Ordovician); Bunya Series, Ordovician; Neranleigh Series, Silurian; and Fernvale Series, Lower Devonian. Ball (1934) suggested that part at least of the Fernvale Series was of late Palaeozoic age.

R. Daintree: Q.J.G.S., 1872, p. 288.

W. B. Clarke: Remarks on the Sedimentary Formations of New South Wales, 4th Ed., 1878, p. 11.

A. C. Gregory: Qld. Parliamentary Papers, 1879.

W. H. Rands: Q.G.S.P., No. 34, 1887, p. 1 and Map.

R. L. Jack: Geological Map of Qld., 1892.

H. I. Jensen: P.R.S.Q., 23, 1912, p. 154.

R. A. Wearne: A.A.A.S., 13, 1912, p. 124.

B. Dunstan: Qld. Min. Index, 1913, pl. 7; Harrap's Geography, 1916, p. 174.

T. W. E. David: B.A.A.S., 1914, p. 259.

H. C. Richards: Aust. Inst. Eng., Bris. Div., 1922, p. 3.

E. C. Saint-Smith: Q.G.M.J., 1923, p. 412.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 135.

W. H. Bryan: P.R.S.Q., 37, 1926, p. 16.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 102.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 26.

T. W. E. David: Explanatory Notes, 1932, pp. 36, 44-46, 48.

L. C. Ball: Q.G.M.J., 1934, p. 37.

BRISBANE TERTIARIES (Skertchly, 1908).—

Suggested name for beds at Oxley, Darra, Sherwood, and Corinda. Assigned to Tertiary.

See Oxley Beds.

S. B. J. Skertchly: Qld. Nat., I, No. 1, 1908, p. 28.

BRISBANE TUFF (Dunstan, 1916).—

Described as the BRISBANE TUFFS, a rock composed of indurated volcanic ash which occurs at the base of the Ipswich Series in and about Brisbane, and listed as his oldest "Series" in the "? Triassic." Originally described by Wilson (1856) as a "Porphyry

dyke,'' the rock is still known in the building-stone and allied trades as ''Porphyry.'' Descriptive references may be found in works by Gregory (1879), who still regarded it as intrusive, Rands (1887), who termed it ''Volcanic Ashy Sandstone'' and placed it ''at or near the base of the Ipswich Beds,'' Jack (1889), Jack and Etheridge (1892), Marks (1910), Richards (1916 and 1919), Walkom (1918), Dunstan (1920), while Mrs. Briggs (1929) gave the first detailed account. David (1932) agreed with earlier writers, assigning it to the Upper Triassic. Richards and Bryan (1934) treated the tuff as a stratigraphical unit but divided it into a lower or stratified type and an upper or massive type.

J. S. Wilson: Q.J.G.S., 1856, p. 288.

A. C. Gregory: Qld. Parliamentary Papers, 1879, p. 367.

W. H. Rands: Q.G.S.P., No. 34, 1887, p. 1.

R. L. Jack: A.A.A.S., I, 1889, p. 203.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 321.

E. O. Marks: Q.G.S.P., No. 225, 1910, Maps.

B. Dunstan: Harrap's Geography, 1916, p. 168; Q.G.S.P., No. 267, 1920, Introduction.

H. C. Richards: P.R.S.Q., 27, 1916, p. 145; P.R.S.Q., 30, 1909, p. 137.

A. B. Walkom: Proc. Linn. Soc., N.S.W., 1918, p. 48.

C. Briggs: P.R.S.Q., 40, 1929, p. 147.

T. W. E. David: Explanatory Notes, 1932, p. 78.

H. C. Richards and W. H. Bryan: P.R.S.Q., 45, 1934, p. 60.

BROADMOUNT MANGANIFEROUS SCHISTS (Richards and Bryan, 1928).—

A series occurring in the Rockhampton area. Placed conformably below the Broadmount Radiolarian Jaspers and conformably above the Emu Park Phosphatic Schists. Assigned to the Lower Devonian and correlated with the Manganiferous Schists of the Gladstone-Curtis Island Series and of the Brisbane district.

David (1932) also placed them in the Lower Devonian.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

T. W. E. David: Explanatory Notes, 1932, Table C.

BROADMOUNT RADIOLARIAN JASPERS (Richards and Bryan, 1928).—

A series in the Rockhampton district. Placed below the Cawarral Limestone and conformably above the Broadmount Manganiferous Schists. Assigned to the Lower Devonian, and correlated with similar beds at Pine Mountain and Bald Mountain.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

BROKEN RIVER LIMESTONE (Etheridge, Senr., 1872).—

Stated to be ''the lowest fossiliferous deposits in the Queensland area, and their age is undoubtedly Lower Devonian or 'Siluro-Devonian.' ''

Jack (1879, 1886) regarded them as the equivalents of the Burdekin Series and placed them in the Lower Devonian. Jack (1889) regarded them as ''undoubtedly equivalent to, or homotaxial with, the Middle Devonian.'' Jack and Etheridge (1892) reaffirmed the correlation with the Middle Devonian Burdekin Beds on palaeontological grounds. Reid (1930) stated that ''there seems an absolute weight of both structural and palaeontological evidence in favour of a lower age than that of the Middle Devonian Burdekin Limestone''; indeed, while he regarded the exact age as non-proven, he suggested that it is exceedingly probable that the beds may be in part as old as Silurian.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 324.

R. L. Jack: Q.G.S.P., No. 1, 1879, p. 15; Handbook, Qld. Geol., 1886, p. 19; A.A.A.S., 1, 1889, p. 199.

R. L. Jack and R. Etheridge, Junr.: Geol. of Qld., 1892, p. 43.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 81, 82.

BROKEN RIVER MARBLES (Richards, 1919).—

Described as possible building stone.

[An horizon in the Broken River Limestones.]

H. C. Richards: P.R.S.Q., 30, 1919, p. 141.

BROOWEENA SERIES (Bryan and Massey, 1926).—

The lowest of the four series into which the geological formation previously known as the Tiaro Series was divided, the name Tiaro Series being restricted by them to the coal-bearing strata. The Brooweena Series is made up of lacustrine shales and sandstones and was correlated with the Ipswich Series of Triassic age.

David (1932) correlated it with the Ipswich Series and placed it in the Keuper.

W. H. Bryan and C. N. Massey: P.R.S.Q., 37, 1926, p. 108 *et seq.*

T. W. E. David: Explanatory Notes, 1932, Table F.

BROUGHTON (Daintree, 1872).—

One of the ten areas assigned to his oldest or "Metamorphic" group of Pre-Devonian age.

R. Daintree: Q.J.G.S., 1872, p. 300.

BRYOZOAN BEDS (Reid, 1930).—

Synonym for *Protoretepora* Horizon.

BUNDAMBA SERIES (Cameron, 1907).—

Synonyms commonly found in liteurature are: BUNDAMBA SANDSTONES, BUNDAMBA BEDS, BUNDAMBA STAGE, BUNDAMBA FORMATION. Cameron (1907) described as BUNDAMBA GRITS an unproductive series of almost unfossiliferous coarse grits and sandstones with thin interbedded finer strata, conformably overlying the coal-bearing Ipswich Beds. Assigned to "Trias-Jura."

Dunstan (1913) placed it as the middle of three series listed as "Trias-Jura ?" Dunstan (1916) listed it as the uppermost "(?) Triassic" Series of Queensland, Walkom (1918) assigned it to the Rhaetic or Upper Triassic, Dunstan (1922) assigned it to Lower (?) Jurassic, Jensen (1923) regarded it as Upper Trias. Whitehouse (1930) regarded it as Triassic and stated that there is some reason to believe that the junction with the overlying Walloon Series is disconformable. David (1932) placed the series either in the Rhaetic or in the Jurassic (equated with the Marburg Stage); this doubt was due to the difficulty of estimating the time value of the important lithological change from the underlying Ipswich Series of Keuper age. He further stated that "There does not appear to have been any definite angular unconformity or any considerable overlap in Queensland between the base of the Jurassic strata and the top of the Triassic rocks." Whitehouse (1942) regarded his Dooloogarah Series as equivalent to and absorbed in the Bundamba Series.

W. E. Cameron: Q.G.S.P., No. 204, 1907, p. 9.

B. Dunstan: Qld. Min. Index, 1913, pl. 0; Harrap's Geography, 1916, p. 168; Q.G.S.P., No. 272, 1922, Introduction.

A. B. Walkom: Proc. Linn. Soc., N.S.W., 1918, p. 95.

H. I. Jensen: Proc. Linn. Soc., N.S.W., 1923, p. 157; Q.G.M.J., 1925, p. 459.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 35; P.R.S.Q., 53, 1942, p. 13.

T. W. E. David: Explanatory Notes, 1932, Tables F. G, and pp. 79, 81.

BUNDAMBA SHALES (Cameron, 1907).—

About 400 feet of ferruginous shales within the Ipswich Series carrying the five lower seams of coal of the district and lying above the Cooneana Sandstone and below the Four-Foot Sandstone.

[N.B.—The Bundamba Shales do *not* form part of the Bundamba Series. Fortunately the term is no longer current.]

W. E. Cameron: Q.G.S.P., No. 204, 1907, p. 19.

BUNDAMBA STEAM COAL BELT (Dunstan, 1916).—

The uppermost of his four divisions of the Ipswich Coal Series. It lies conformably on his Cooneana Sandstones.

B. Dunstan: Harrap's Geography, 1916, p. 168.

BUNYA SERIES (Denmead, 1928).—

Mica phyllites and quartz-mica schists with phosphatic cherts, slates, and quartzites in the upper portions of the series. The lowest but one of the four series into which he divided the Brisbane Schists. Tentatively assigned to the Silurian.

Denmead (1929) recorded "a small fossil identified by Mr. R. A. Keeble as belonging to the family Diplograptidae, from Brisbane Schists (Middle of Bunya Series), of Tweed Heads. The age was considered to be top of the Ordovician or lowest Silurian." David

(1932) referred to the *Diplograptus* as coming from near the top of the series which he therefore tentatively referred to the Ordovician.

[The Bunya Series is in part equivalent to the "Phosphatic Schists" of other authors.]

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103; 40, 1929, p. vii.

T. W. E. David: Explanatory Notes, 1932, p. 44.

BURDEKIN-CAMOOWEAL-GLADSTONE-BRISBANE SERIES (Dunstan, 1913).—

Listed as a Devonian Series.

This "Series" proved far too comprehensive and cumbrous and was never again used in official publications. See Burdekin Formation, Gladstone-Curtis Island Series, and Brisbane Schists.

B. Dunstan: Qld. Min. Index, 1913, pl. 0.

BURDEKIN SERIES (Jack, 1889).—

Jack described as the BURDEKIN FORMATION a marine series "typically developed in the Burdekin Valley, on the Fanning, Broken, and Reid Rivers. The fossilferous beds are limestones occasionally altered to marble" and containing Middle Devonian forms.

Daintree (1872) placed the "BURDEKIN RIVER LIMESTONE" in the Devonian. Jack (1879) assigned the strata of Burdekin Downs to Lower Devonian. Jack and Etheridge (1892) treated it as the one Middle Devonian Formation in Queensland. Dunstan (1916) redefined it as the Burdekin Series and placed it together with five other series in the Devonian. David (1932) divided the series into two parts; the lower consisting of 9,400 feet of unfossiliferous grey and green tuffaceous slates, grits and conglomerates, he placed in the lower Devonian. The upper, cheifly massive coralline limestone including the Fanning Limestone 7,000 feet thick, was referred to the Givetian division of the Middle Devonian. Hill (1942) referred the limestones of the Burdekin Series to the middle section of the Givetian and correlated them with those of Fanning River and Reid Gap.

R. Daintree: Q.J.G.S., 1872, p. 290.

R. L. Jack: Q.G.S.P., No. 1, 1879, p. 283; A.A.A.S., 1, 1889, p. 198.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 34.

B. Dunstan: Harrap's Geography, 1916, p. 172.

T. W. E. David: Explanatory Notes, 1932, Table C.

D. Hill: P.R.S.Q., 53, 1942, p. 229; 54, 1943, p. 61 and Table.

BURRUM SERIES (Jack, 1888).—

Synonyms are BURRUM FORMATION, BURRUM BEDS, BURRUM COAL MEASURES and BURRUM COAL SERIES.

The age of this series and its relationships to the Maryborough Series, Ipswich Series and Tiaro Series respectively have caused considerable confusion in the past. Gregory (1879) classed the Burrum coal measures with his "Carboniferous Strata" of Palaeozoic age (e.g., Bowen coal measures), regarding them as older than his "Carbonaceous Strata" of Mesozoic age (e.g., Ipswich coal measures). Tenison-Woods (1883) was much nearer the truth in assigning the series to the Upper Lias ?, but placed it beneath the Ipswich coal measures, which he thought Jurassic. Jack (1886), (1888) regarded it as of Triassic age and as "intermediate between the Bowen River beds (Carbonifero-Permian) and the Ipswich Beds (Jurassic)." Jack and Etheridge (1892) treated the Burrum Beds and Ipswich Beds "as subdivisions of a single period—the Trias-Jura," the Burrum Beds being provisionally classed as the "Lower Trias-Jura Formation." For many years it was held that (1) the Burrum Series was older than the Ipswich Series, and (2) that the Burrum Series was of the same age as, and continuous in the field with the Tiaro coal measures—indeed the term Burrum Series was often used to cover the coal measures of the Tiaro district. Dunstan (1905) still followed Jack and Etheridge's (1892) arrangement. Jensen (1906) regarded the Burrum Series as equivalent to the Ipswich Series, and stated that the two series were continuous in the field. Cameron (1907) wrote that "the evidence for considering the Burrum Beds as belonging to an earlier period of the Trias-Jura [than the Ipswich Beds] is not conclusive. The two formations have long been considered identical in age by the Geological Survey." Dunstan (1912a) showed that the Burrum coal measures were *above* the Maryborough Series and not faulted against them as had previously been supposed, but he was undecided whether (1) the Burrum coal measures should be elevated to the Cretaceous, or (2) the Maryborough Beds should be lowered from the Cretaceous to the Trias-Jura. Etheridge (1912) examined fossils from the Maryborough Beds and decided they were Cretaceous, hence Dunstan (1912b) elevated the Burrum Series from Lower Trias-Jura to the Rolling Downs Formation (Cretaceous). Dunstan (1913) used the name Burrum Series as a comprehensive term which included the Maryborough Series, the whole being regarded as equivalent to the Rolling Downs Formation. Richards (1914) brought forward further proofs that the Burrum Series was

younger than the Maryborough Series, and therefore much younger than the Ipswich Series. At the same time it was shown that the Tiaro coal measures were older than the Maryborough Series, and still older than the Burrum Series. Dunstan (1916) redefined the "Burrum Coal Series" as "coal-bearing fresh-water sediments conformable over the Maryborough Marine Series," assigned it to the upper part of the Cretaceous, and regarded it as equivalent to the Winton Series. Walkom (1919) assigned the Burrum flora to the Lower Cretaceous and regarded it as homotaxial with the Neocomian-Barremian of Europe. Jensen (1925) seemed unconvinced of the Cretaceous age of the series. Whitehouse (1930) suggested that it was of Upper Aptian and Albian age, possibly extending even higher into the Cretaceous. David (1932) stated that "the fresh-water Burrum Series, 5,000 feet thick, probably passes up [from the Aptian] into the Albian."

R. L. Jack: Hbk., Qld. Geol., 1886, Map; "Mineral Wealth of Qld.," 1888, p. 61.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 312.

A. C. Gregory: Qld. Parliamentary Papers, 1879, p. 369.

J. E. Tenison-Woods: Proc. Linn. Soc., N.S.W., 1883, p. 54.

B. Dunstan: Geol. Map Qld., 1905; Ann. Rept., Dept. Mines, 1912a, p. 195; Q.G.M.J., 1912b, p. 642; Qld. Min. Index, 1913, pl. 5; Harrap's Geography, 1916, p. 166.

R. Etheridge, Junr.: Letter to B. Dunstan, 1912.

H. I. Jensen: Proc. Linn. Soc., N.S.W., 1906, p. 105; Q.G.M.J., 1925, p. 460.

W. E. Cameron: Q.G.S.P., No. 204, 1907, p. 13.

H. C. Richards: A.A.A.S., 14, 1914, p. 179 *et seq.*

A. B. Walkom: Q.G.S.P., No. 263, 1919, p. 12.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 38.

T. W. E. David: Explanatory Notes, 1932, Table H and p. 85.

BYMOUNT STAGE (Jensen, 1929).—

Upper Stage of the "Big Sandstone" of his Middle Walloon Series as developed in the Roma district. It is underlain by a limey shale series which in turn conformably overlies the sandstones of his Gunnewin Stage. Also referred to as the BYMOUNT SANDSTONE.

H. I. Jensen: Q.G.M.J., 1929, p. 283.

C

CALLIDE SERIES (Dunstan, 1915).—

Coal measures at Callide Creek regarded as doubtfully equivalent to the Walloon Series, and assigned to the Jurassic.

Dunstan (1916) definitely included it within the Walloon Series. Jensen (1923) placed the CALLIDE COAL MEASURES in the Lower Triassic. Reid (1940) stated that it is separated by unconformities from the Palaeozoic rocks below and the Tertiary beds above.

B. Dunstan: Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 167.

H. I. Jensen: Proc. Linn. Soc., N.S.W., 1923, p. 157.

J. H. Reid: Q.G.M.J., 1940, p. 186.

CALVERT SANDSTONE (Richards, 1919).—

A friable sandstone within the Bundamba (?) Series; once used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 122.

CAMPASPE-CAPE SERIES (Dunstan, 1913).—

Synonym for Cape-Campaspe Series.

B. Dunstan: Qld. Min. Index, 1913, pl. 17.

CANIA LIMESTONE (Reid, 1930).—

An important horizon in the Rockhampton Series.

Hill (1943) correlated it with the Riverleigh, Lion Creek and Cannindah [Lower] Limestone, assigning it to the Upper Visèan or possibly Moscovian.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 15, 35.

D. Hill: P.R.S.Q., 54, 1943, p. 62 and Table.

CANNINDAH LIMESTONES AND VOLCANICS (Reid, 1927).—

A marine series containing a striking oolitic limestone horizon together with associated volcanics.

Whitehouse (1927) assigned the limestone to the Upper Visèan correlating it with the Lion Creek Limestone. Reid (1930) stated that there is a conformable sequence from *Lepidodendron australe* beds (Lower Star ?) to this Cannindah [Lower] Limestone, above which are 1,725 feet of marine strata containing the Cannindah [Upper] Limestone which he claimed was deposited in the interval represented by his Stanwell Disconformity. Hill (1934) regarded the correlation of these upper beds with the "postulated non-sequence" as not proven.

J. H. Reid: Q.G.M.J., 1927, p. 184; Q.G.S.P., No. 278, 1930, p. 26.

F. W. Whitehouse, Q.G.M.J., 1927, p. 189.

D. Hill: P.R.S.Q., 45, 1934, p. 106.

CANNINDAH [LOWER] LIMESTONE (Reid, 1927).—

An oolitic coralline limestone forming the most striking horizon in his Cannindah Limestones and volcanics.

Whitehouse (1927) assigned it to the Upper Visèan and correlated it with the Lion Creek Limestone. Hill (1943) correlated it with the Lion Creek, Riverleigh and Cania Limestones, assigning it to the Upper Visèan or possibly Moscovian.

J. H. Reid: Q.G.M.J., 1927, p. 183.

F. W. Whitehouse: Q.G.M.J., 1927, p. 189.

D. Hill: P.R.S.Q., 54, 1943, p. 63 and Table.

CANNINDAH [UPPER] LIMESTONE (Reid, 1930).—

A coralline limestone in the upper part of his Cannindah Limestones and Volcanics, regarded as having been deposited within the interval represented by his Stanwell Disconformity.

Hill (1934) regarded the correlation of this horizon with the "postulated non-sequence" as not proven. Whitehouse (1936) correlated this horizon with the Neerkol Series at Stanwell and with equivalent beds at Mt. Barney.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 32.

D. Hill: P.R.S.Q., 45, 1934, p. 106.

F. W. Whitehouse in A. H. Voisey: Proc. Linn. Soc., N.S.W., 1936, p. 163.

CANOONA BEDS (Reid, 1930).—

Although he did not formally propose this term, Reid described beds about Canoona containing *Lepidodendron australe*, which he provisionally classified as Lower Star (Upper Devonian).

Carey and Browne (1938) equated the "CANOONA SERIES" with the lower part of the Drummond Range Beds and with the lower division of the Star Beds.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 15, 26.

S. W. Carey and W. R. Browne: P.R.S., N.S.W., 71, 1938, p. 602.

CANOONA-CAWARRAL SERPENTINE SERIES (Dunstan, 1916).—

Massive serpentines, serpentinous schists and slates lying below the Cawarral-Raglan Series and unconformably above beds of ? Ordovician quartzites. Correlated with his Kilkivan Serpentine Series and his Pine Mountain Serpentine Series. Tentatively assigned to the Devonian.

B. Dunstan: Harrap's Geography, 1916, p. 173.

CAPE-CAMPASPE SERIES (Dunstan, 1913).—

A series of deposits in the valleys of the Cape and Campaspe Rivers to the south of Charters Towers. Listed and mapped as Tertiary.

B. Dunstan: Qld. Min. Index, 1913, pl. 15.

CAPE RIVER SERIES (Daintree, 1868).—

A series of quartzites, slates, schists, and other metamorphic rocks. Divided into three series, viz., "Upper," "Middle," and "Lower Cape."

Daintree (1872) included it as one of the ten areas which he assigned to his oldest or "Metamorphic" group of Pre-Devonian age.

R. Daintree: Report on Cape River Diggings, Qld. Parl. Papers, 1868; Q.J.G.S., 1872, p. 300.

CAP ROCK (Reid, 1935).—

Superficial material, commonly a red nodular rock with a coarsely perforated or honeycombed appearance, found overlying the granite of the Croydon goldfield.

See Duricrust, Laterites (Tertiary).

J. H. Reid: Q.G.M.J., 1935, p. 127.

CARBONACEOUS (Daintree, 1872).—

The lowest of his three Mesozoic formations, listed and mapped. Included the Maryborough beds, the Tivoli coal mine (Ipswich) and the Burrum coal seams.

The term was used primarily to contrast the Mesozoic or "Carbonaceous" coal measures of Eastern Australia with the Upper Palaeozoic or "Carboniferous" coal measures. Daintree (1872) considered the "Carbonaceous" deposits (which were thought to be restricted to the east of the Dividing Range) to be the fresh-water equivalents of his marine "Oolitic" and "Cretaceous" measures west of the divide. Clarke (1878) stated that "The conclusion I have all along held is, that the 'Carboniferous' strata, and those which it pleases dissidents to fancifully designate as 'Carbonaceous' (which is at the best a *misnomer*) are parts of one great series . . . ." But Gregory (1879) still used CARBONACEOUS SERIES as a comprehensive term for the coal measures and associated rocks of South-eastern Queensland, embracing what are known now as the Ipswich Series, Bundamba Series, and Walloon Series.

R. Daintree: Q.J.G.S., 1872, p. 273.

W. B. Clarke: Remarks on the Sedimentary Formations of New South Wales, 4th Ed., 1878, p. 36.

A. C. Gregory: Qld. Parliamentary Papers, 1879, p. 369.

CARBONIFERO-PERMIAN (Jack, 1889).—

Synonym for "Permo-Carboniferous." The term CARBO-PERMIAN has also been used in the same sense.

R. L. Jack: A.A.A.S., 1, 1889, p. 198.

CARBONIFEROUS (Daintree, 1872).—

The uppermost of his three Palaeozoic systems. Used in a special sense to contrast the Upper Palaeozoic (Bowen, Dawson and Mackenzie) coal measures of Queensland with the Mesozoic coal measures which he termed "Carbonaceous."

R. Daintree: Q.J.G.S., 1872, p. 285.

CARBOROUGH (SANDSTONE) SERIES (Reid, 1928).—

Light coloured siliceous sandstones and grits of the "Hawkesbury" type assigned to the Triassic and correlated with the Redcliffe Series.

Reid (1929, 1930) stated that in the type area it is conformable with the underlying Bowen Series but that in other areas marked unconformities exist. He argued on tectonic grounds that the lower Carborough is definitely older than the Ipswich Series and the Stanwell Coal Measures. David (1932) placed the series in the Upper Bunter and as older than the Ipswich Series.

J. H. Reid: Q.G.M.J., 1928, pp. 193, 196, 236; Rept. Fifth Artesian Water Conference, 1929, p. 31; Q.G.S.P., No. 278, 1930, pp. 77, 86.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 388.

T. W. E. David: Explanatory Notes, 1932, Table F.

CARDROSS-MULDIVA SERIES (Jensen, 1923).—

A strongly metamorphosed series regarded as part of his Etheridge Series.

H. I. Jensen: Q.G.S.P., No. 274, 1923, pp. 28-29, 75.

CARDROSS SERIES (Jensen, 1923).—

A local name for his more extensive Cardross-Muldiva Series.

H. I. Jensen: Q.G.S.P., No. 274, 1923, pp. 28-29, 75

CARNARVON RED MEMBER (Reid, 1930). —

The red sandstone which forms cliffs on Mt. Carnarvon and has proved a useful index bed in the Upper Bowen Series, as developed in the Springsure district.

J. H. Reid: Q.G.M.J., 1930, p 93

CASTLE CREEK BEDS (Hill, 1943).—

Coralline limestones tentatively correlated with the Coral Stage and consequently placed in the Artinskian.

D. Hill: P.R.S.Q., 54, 1943, Table opp. p. 64.

CASUARINA-NARROWS SERIES (Dunstan, 1913).—

Fresh-water sediments in the neighbourhood of Rockhampton. Listed and mapped as Tertiary.

David (1932) placed the beds of the Narrows in the Oligocene.

B. Dunstan: Qld. Min. Index, 1913, pl. 3.

T. W. E. David: Explanatory Notes, 1932, Table I.

CATHERINE SANDSTONES (Reid, 1930).—

A stage of barren grey and red sandstones probably of fresh-water origin overlying the Coral Stage and within the Lower Bowen Series as developed in the Springsure district.

J. H. Reid: Q.G.M.J., 1930, p. 95.

CAVE BRECCIAS (Jack and Etheridge, 1892).—

One of the Post-Pliocene "Formations" of Queensland.

Dunstan (1916) used the name "CAVE DEPOSITS" for cave earth and guano in limestone caves as at Mt. Etna and Chillagoe, and listed them as a Tertiary Series.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

B. Dunstan: Harrap's Geography, 1916, p. 164.

CAWARRAL-RAGLAN SERIES (Dunstan, 1916).—

Coralline limestones with shales and quartzites. Apparently conformable with the Rockhampton Series (Carboniferous) above. Regarded as equivalent to the Burdekin Series and assigned to the Devonian period.

Richards and Bryan (1928) assigned the CAWARRAL LIMESTONES to the Middle Devonian and correlated them with the limestones of Silverwood, Pine Mountain, Boyne River and Marmor. Whitehouse (in Bryan and Whitehouse, 1930) included the limestone at Raglan as the most westerly locality of his Etna Series.

[This series should not be confused with the "Cawarral-Rockhampton Beds" of Jensen which are Carboniferous in age and usually referred to as the "Rockhampton Series."]

B. Dunstan: Harrap's Geography, 1916, p. 172.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

W. H. Bryan and F. W. Whitehouse: P.R.S.Q., 41, 1930, p. 136.

CAWARRAL-ROCKHAMPTON BEDS (Jensen, 1925).—

A marine series of Carboniferous age. Practically synonymous with the "Rockhampton Series."

[This series should not be confused with Dunstan's (1916) Cawarral-Raglan Series, which is of Devonian age.]

H. I. Jensen: Q.G.M.J., 1925, p. 422.

CHILLAGOE-CLONCURRY SERIES (Dunstan, 1913).—

Listed as Silurian.

[This supposed "Series" was formed by linking together the fossiliferous Silurian rocks of Chillagoe (subsequently known as the Chillagoe Series) with their supposed equivalent the Cloncurry Series. The correlation was an unhappy one, for the greater part of the Cloncurry Series has since been proved to be Pre-Cambrian.]

B. Dunstan: Qld. Min. Index, 1913, pl. 0.

CHILLAGOE SERIES (Dunstan, 1916).—

Coralline limestones, radiolarian jaspers and shales. Assigned to the Silurian.

Jack and Etheridge (1892) had placed it in their Gympie Formation (Permo-Carboniferous); later, Jack (*fide* Dunstan, 1901) classed it as Devonian and Skertchly (1899) as late Carboniferous. On the discovery of *Halysites*, Dunstan (1901) referred it to the Silurian. Etheridge (1904) placed it as either Ordovician or Silurian. Whitehouse (1930) stated that the fauna "suggests an Upper Silurian age." David (1932) supported this. Hill (1943) wrote, "The faunal associations . . . . suggest that Ludlovian and Devonian horizons are present."

R. L. Jack and R. Etheridge: Geol. and Pal. Qld., 1892, pp. 607, 739.

S. B. J. Skertchly: P.R.S.Q., 14, 1899, p. xxiii.

B. Dunstan: Ann. Rept. Geol. Surv. Qld. for 1900, 1901, p. 21; Harrap's Geography, 1916, p. 173.

R. Etheridge: Q.G.S.P., No. 190, 1904, p. 32.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 28.

T. W. E. David: Explanatory Notes, 1932, p. 47.

D. Hill: P.R.S.Q., 54, 1943, p. 58 and Table.

CLARKE RIVER SERIES (Saint-Smith, 1922).—

"A great thickness of sandstones, etc., containing *Lepidodendron* and thin coal bands, underlain unconformably by an older series" which he regarded as the lateral equivalent of the (Upper Devonian) Kangaroo Hills Series. Assigned to the Lower Carboniferous.

E. C. Saint-Smith: Q.G.M.J., 1922, p. 312.

CLEMATIS SANDSTONE (Jensen, 1926).—

Siliceous sandstones in the Carnarvon area, below the Ipswich Series, passing downwards into tuffs, breccias and in the Dawson area, dacites.

Denmead (1930) placed the sandstone in the Upper Bowen Series on an horizon above the Carnarvon (Red Member) Sandstones.

H. I. Jensen: Q.G.S.P., No. 277, 1926, pp. 14, 22.

A. K. Denmead: Q.G.M.J., 1930, p. 156.

CLERMONT SERIES (Jensen, 1921).—

A series of unfossiliferous "metamorphics" of unknown age.

Reid (1936) referred to this series as the "CLERMONT SLATES."

[This series should not be confused with Dunstan's (1913) Clermont-Tolmies-St. Mary's Series of Permo-Carboniferous age.]

H. I. Jensen: Q.G.M.J., 1921, p. 491.

J. H. Reid: Q.G.M.J., 1936, p. 228.

CLERMONT-TOLMIES-ST. MARY SERIES (Dunstan, 1913).—

Coal measures and associated sediments regarded as the uppermost of his several Permo-Carboniferous Series.

Reid (1925) tentatively correlated this Series with his Upper Bowen.

[This series should not be confused with Jensen's (1921) "Clermont Series," which is composed of very much older (metamorphic) rocks.]

B. Dunstan: Qld. Min. Index, 1913, pl. 0.

J. H. Reid: Q.G.M.J., 1925, p. 10.

CLONCURRY (Daintree, 1872).—

One of the ten areas assigned to his oldest or "Metamorphic" group of Pre-Devonian age.

See "Cloncurry Series."

R. Daintree: Q.J.G.S., 1872, p. 300.

CLONCURRY SERIES.—

A great many differences of opinion have been centred around this series, but they have all arisen from one of two causes, viz.: (1) The term has been used in a much more comprehensive sense by some writers than by others; (2) differences of opinion have arisen as to the age of certain horizons either within or supposedly within the series. All of the many geologists who have studied the Cloncurry area were (and are) agreed that the series consists essentially of unfossiliferous metamorphic rocks, but while some restricted the series to these rocks, others extended it to include less altered sediments, some of which were then or subsequently known to contain fossils. Thus what is now usually known as the Toko Series was regarded by some, e.g., Jack and Dunstan, as part of the series, the whole of which was therefore referred by them to the "Silurian" and correlated with the Chillagoe Series, although the Toko Series fossils subsequently proved to be of Ordovician age. At the same time other geologists, e.g., Gregory (1910), Woolnough (1912), Jensen (1918-20), Saint-Smith (1923) were of the opinion that the metamorphic rocks of the Cloncurry area were of Pre-Cambrian age. Saint-Smith (1923) showed that part of the area supposedly occupied by the Cloncurry Series was made up of fossiliferous beds of Cambrian age (now known as the Templeton Series), but that these were separated by an unconformity from the Cloncurry Series proper which was therefore assigned to the Pre-Cambrian. David (1932) abandoned the term and used in its place certain (previously unpublished) serial names selected from those used by Shepherd in the field. These David arranged as follows:— Leichhardt and Kalkadoon Series (approximately equivalent) in the Archaeozoic, Argylla Series higher in the Archaeozoic, Corella Series and Mt. Isa shales in the Older (?) Proterozoic. Honman (1936) modified David's arrangement by grouping the Leichhardt, Kalkadoon and Argylla Series and dropping the first of these serial names. The resulting Kalkadoon-Argylla Series he assigned to the Older Archaeozoic. Lying unconformably on this composite series he placed the Soldier's Cap Series of Newer Archaeozoic Age. This was succeeded after another unconformity by the Mt. Isa Series (Older Proterozoic) which

in turn, and after yet another unconformity, was succeeded by the Mount Quamby Series (Newer Proterozoic). Honman (1937) stated that the Mount Isa Series and Soldier's Cap Series are virtually equivalent but later in the same report showed them as separate but apparently conformable.

J. W. Gregory: Encyclopaedia Britannica, 11th Ed., 1910, 2, p. 943.

W. G. Woolnough: Northern Territory Bull., No. 4, 1912, pp. 37-38.

H. I. Jensen: Roy. Geog. Soc., Qld., 34-35, 1918-20, p. 25.

E. C. Saint-Smith: Q.G.M.J., 1923, p. 412.

B. Dunstan: Harrap's Geography, 1916, p. 174.

T. W. E. David: Explanatory Notes, 1932, p. 31.

C. S. Honman: A.G. & G.S. of N.A. Rept., Dec., 1935, 1936, p. 49; Rept., Dec., 1936, 1937, pp. 60, 65, pl. 4.

COAL BEARING BEDS (Cameron, 1899).—

Comprehensive term to include the whole of the Ipswich Series above the "Basal Conglomerates."

Cameron (1907) used the term "Ipswich Beds" in the same sense.

W. E. Cameron: Q.G.S.P., No. 147, 1899, p. 3; No. 204, 1907, p. 14 and map.

COAL MEASURE SERIES (Aplin, 1869).—

A term used for the Mesozoic coal measures of the Darling Downs.

Now included in the Walloon Series. See Killarney Coal Measures.

C. D. O'H. Aplin: Report on Upper Condamine, Legislative Assembly Papers, 1869.

COASTAL SANDROCK (Dunstan, 1916).—

Black and brown sand with lignite fragments found along the southern coast and adjacent islands. Listed as Tertiary.

B. Dunstan: Harrap's Geography, 1916, p. 164.

COILOTAN ? STAGE (Whitehouse, 1930).—

Suggested as a possible additional stage within the Roma Series, below his Ancyloceratan Stage.

David (1932) placed the "COILOTIS STAGE" in the lower part of the Aptian.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 37.

T. W. E. David: Explanatory Notes, 1932, Table H.

COLLINSVILLE COAL MEASURES (Reid, 1924).—

The lower of his two divisions of the "Middle Bowen."

Reid (1929) stated that "they are essentially a sandstone series without evidence of contemporaneous vulcanism, and of fresh-water origin throughout except for one marine transgression of relatively short duration"; thickness 700 feet with five coal seams. David (1932) placed them in the lower part of the Middle Bowen, at the top of the Lower Permian.

J. H. Reid: Q.G.M.J., 1924, p. 401; Q.G.S.P., No. 276, 1929, p. 59.

T. W. E. David: Explanatory Notes, 1932, Table E.

CONDAMINE BEDS (Richards and Bryan, 1925).—

A division of the Fault Block Series of Permo-Carboniferous age in the Silverwood-Lucky Valley area. They consist of some 3,000 feet of marine sediments (containing the *Trachypora* horizon) overlain by 1,000 feet of rhyolitic tuffs and marine tuffaceous grits. They are shown as essentially younger than both the *Eurydesma* Beds and the Wallaby Beds of the same series.

Reid (1930) argued that these constitute the lowest beds of the Fault-Block Series and correlated them with his Gympie (Transition) Series. Voisey (1935) also regarded them as the oldest beds of the series and older than the *Eurydesma* Beds. Voisey (1936, 1939) stated that the Fault Block Series as a whole is "to be considered as Lower Permian in age."

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 67

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 51.

A. H. Voisey: P.R.S.Q., 46, 1935, p. 60 *et seq.* (see also p. xiv); Proc. Linn. Soc., N.S.W., 1936, p. 163; 1939, p. 389.

CONGLOMERATE GROUP (Dunstan, 1912).—

A division of his "Middle Gympie Formation" overlying the "First Slate Group."

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

CONSTANCE RANGE SERIES (Jensen, 1940).—

A series of marine sandstones, breccias, fossiliferous limestones and other sediments in the Lawn Hill area. Assigned to the lower Middle Cambrian.

Cameron (1901) had placed these strata provisionally in the Devonian. Ball (1911) had grouped the limestone with neighbouring post-Tertiary limestones. Dunstan included all the strata in his comprehensive Lawn Hill Series which he regarded as Devonian (1913) but which he later placed tentatively in the Carboniferous (1916).

H. I. Jensen: A.G. & G.S. of N.A. Rept. to Dec., 1939, 1940, p. 23, pl. 2.

W. E. Cameron: Ann. Prog. Rept., Geol. Surv., Qld., for 1900, 1901, p. 8.

L. C. Ball: Q.G.S.P., No. 232, 1911, pp. 19, 20.

B Dunstan: Qld. Min. Index, 1913, pl. 21; Harrap's Geography, 1916, p. 171.

COONEANA SANDSTONE (Cameron, 1907).—

The lowest persistent sandstone bed of the Ipswich Series as developed in the type area.

One of the four main divisions of the "Ipswich Coal Series" of Dunstan (1916).

W. E. Cameron: Q.G.S.P., No. 204, 1907, p. 19.

B. Dunstan: Harrap's Geography, 1916, p. 168.

COORPAROO CONGLOMERATES (Dunstan, 1915).—

Conglomeratic deposits locally developed at the base of the Brisbane Tuff.

[These represent the basal horizon of the Ipswich Series in the Brisbane area.]

B. Dunstan: Q.G.S.P., No. 252, 1915, Introduction.

CORAL STAGE (Reid, 1930).—

A marine stage containing abundant *Monilopora nicholsoni* and *Trachypora wilkinsoni* occurring within the Lower Bowen Series as developed within the Springsure district.

Hill (1943) correlated this tentatively with the Castle Creek Beds and assigned it to the Artinskian.

[N.B.—Not to be confused with the Coral Creek marine sediments, which occur high in his Middle Bowen Series as developed in the type area.]

J. H. Reid: Q.G.M.J., 1930, p. 96.

D. Hill: P.R.S.Q., 54, 1943, Table opp. p. 64.

CORELLA SERIES (David, 1932).—

Massive mamorised limestones in the Cloncurry area, assigned to the Older (?) Proterozoic.

Honman (1936) included it in the Mt. Isa Series of Older Proterozoic age.

See Cloncurry Series.

T. W. E. David: Explanatory Notes, 1932, p. 32.

C. S. Honman: A.G. & G.S. of N.A. Rept., Dec., 1935, 1936, p. 49.

CORNWALL COAL MEASURES (David, 1932).—

Beds above the Alcurah Coal Measures and high in the Walloon Series (in the broad sense) occurring in the Roma district, and assigned to the Upper Jurassic.

See "Orallo Measures."

T. W. E. David: Explanatory Notes, 1932, Table G, and p. 126.

CORONICERATAN STAGE (Whitehouse, 1927).—

A small local development of marine strata occurring within the fresh-water Walloon Series at Walsh River in Northern Queensland assigned to this stage of the Lower Lias.

[There appears to be some doubt as to the authenticity of the record on which this is based. See Walsh River Beds.]

F. W. Whitehouse: P.R.S.Q., 38, 1927, p. 105.

CRACOW LIMESTONE (Denmead, 1931).—

Massive shelly limestone containing marine fossils. "There is little reason to doubt that we have here an horizon not far removed from the Dilly Glacial Stage of the Lower Bowen."

Whitehouse (1931) described fossils from four different horizons stating that "The collection as a whole is a typical assemblage of Lower Bowen forms." Denmead (1937) showed that the marine strata which include this limestone have at the base silicified shale (Sponge Beds) and are underlain by volcanics, chiefly andesite and overlain by fresh-water shales, sandstones and conglomerates, the whole being referred to the Lower Bowen.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 68.

A. K. Denmead: Q.G.M.J., 1931, p. 307; 1937, p. 194.

F. W. Whitehouse: Q.G.M.J., 1931, p. 359.

CRACOW SERIES (Denmead, 1933).—

A series of lavas, tuffs and agglomerates in the Cracow district unconformably overlying the Lower Bowen volcanics, and conformably beneath the Clematis sandstone. The age of the series would appear to be Lower Triassic or latest Permian.

Denmead (1937) placed it as Mesozoic.

[N.B.—This series does not include the Cracow Limestone, which locally forms part of the Lower Bowen Series.]

A. K. Denmead: Q.G.M.J., 1933, p. 197; 1937, p. 194.

CRESSBROOK CREEK SERIES (Bryan, 1928).—

Name given to certain fossilferous marine strata and associated acid volcanics of Permo-Carboniferous age in the valley of Cressbrook Creek, near Esk.

Reid (1930) correlated this with his Gympie (Transition) Series. Whitehouse (1930) correlated it with the Fault Block Series at Silverwood, and equivalent marine strata at Silverspur, Gympie, Cania and Lakes Creek.

W. H. Bryan: Map in Gutteridge's Report on Brisbane Water Supply, 1928.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 60.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 33.

CUNNO SERIES (Whitehouse, 1940).—

A local serial name for calcareous sandstones, shales and mudstones occurring as a marginal fringe of the Great Artesian Basin. It lies conformably above the Attica Series.

Whitehouse (1942) stated that this is equivalent to and consequently absorbed in the "standard" Walloon Series.

F. W. Whitehouse: Univ. of Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, p. 7; P.R.S.Q., 53, 1942, p. 13.

D

DALRYMPLE AND DOTSWOOD SERIES (Jack, 1879).—

Synonym for Dotswood Beds.

[Not to be confused with the Dalrymple Sandstones of Tenison-Woods.]

R. L. Jack: Q.G.S.P., No. 1, 1879, p. 13, Map No. 2.

DALRYMPLE SANDSTONES (Tenison-Woods, 1880).—

"Strata of almost horizontal ferruginous sandstone in appearance very like the Hawkesbury sandstones of Port Jackson" capping highly inclined Palaeozoic rocks. Occur at Dalrymple Range, Mount Platform, Connors Nob, Indian Head, Cape Bedford, and Mount Mulligan.

[Not to be confused with Dalrymple and Dotswood Series of Jack.]

J. E. Tenison-Woods: Qld. Phil. Soc., 1880, p. 6.

DARGALONG GNEISSES (Whitehouse, 1930).—

The older of two groups of gneisses and schists which (with the Einasleigh Gneisses, *q.v.*) Whitehouse considered may reasonably be assigned to the Pre-Cambrian.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 24.

DARLING DOWNS SERIES (Dunstan, 1913).—

Used as part of a composite name, viz., "Walloon-Darling Downs-Waterpark Series" and assigned to the uppermost of the three divisions of the "Trias-Jura."

Dunstan (1915) used it as a separate serial name equivalent to the Walloon Series (the Waterpark Series having meanwhile been elevated to the Tertiary era) and assigned it to the Jurassic. Dunstan (1916) reverted to the earlier general practice of including the Darling Downs Coal measures within the comprehensive "Walloon Series." The term "Darling Downs Series" was thus absorbed. See Killarney Coal Measures.

B. Dunstan: Qld. Min. Index, 1913, pl. 0; Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 167.

DEEP LEADS (David, 1914).—

He divided the Deep Leads of Eastern Australia into the "Older" attributed to the Miocene and the "Newer" placed in the Pliocene.

[The Older and Newer Deep Leads may be respectively the Drifts (? Miocene) and Drifts (? Pliocene) of Jack and Etheridge, 1892.]

T. W. E. David: B.A.A.S., 1914, p. 256.

DERBYIA SENILIS HORIZON (Reid, 1929).—

A calcareous sandstone "crowded with shell remains of *Derbyia.*" This forms an horizon of local value within the Middle Bowen Series. It lies about 350 feet above the Big *Strophalosia* Horizon and is immediately beneath a bed of glacial till.

J. H. Reid: Q.G.S.P., No. 276, 1929, p. 68; No. 278, 1930, opp. p. 76.

DESERT SANDSTONE (Daintree, 1872).—

Name applied to "horizontal beds of coarse grit and conglomerate" and remarkable for "the sandy barren character of its disintegrated soil" found "on the eastern branches of the Upper Flinders River and elsewhere." Daintree thought that "without doubt it is the most recent, widely spread stratified deposit developed in Queensland." He assigned it to the "Cainozoic" and calculated that it covered approximately 150,000 square miles, i.e., roughly one-fourth of the State of Queensland.

Etheridge, Senr. (1872) placed the "Desert Sandstone" between an "Upper Volcanic" series and a "Lower Volcanic," both of which were included in the "Cainozoic." Tenison-Woods (1883) described it as "an eolian formation, in isolated patches all over the colony," and stated that it "lies above Jurassic coal." Jack (1889) mentioned fossils identical with those of the Rolling Downs Formation (Cretaceous) having been found within the series at Croydon in spite of the fact that as Jack himself pointed out the Desert Sandstone "overlies the Rolling Downs formation unconformably." Jack therefore placed the Desert Sandstone in the Upper Cretaceous and correlated with it the Maryborough Beds of the coast. Jack and Etheridge (1892) listed it as the Upper Cretaceous "Formation" and stated that it had once covered three-fourths of Queensland. Among the numerous deposits included by them in the formation were the following:—(1) Sandstones at Battle Camp near Cooktown in which Norman Taylor (1872) had found *Ostrea* and *Hinnites*; (2) sandstones at Croydon and Maryborough containing Cretaceous marine fossils; (3) sandstones at Betts Creek containing *Glossopteris*; (4) sandstone between the Mitchell and Walsh Rivers containing *Glossopteris*, and previously referred by Taylor (1873) to the "Carboniferous"; (5) sandstone of the Carborough Range (see Carborough Series); (6) sandstones near Cooktown including Tenison-Wood's Dalrymple Series; (7) certain rocks in south-east Queensland since described by Richards as rhyolitic and trachytic tuffs of Tertiary age. Dunstan (1913) retained the Desert Sandstone Series as the one Upper Cretaceous formation in Queensland, although the Maryborough Beds were no longer included (being correlated with the Rolling Downs Series). Saint-Smith (1914) suggested the elimination of the term Desert Sandstone, as it possessed no stratigraphical significance, including as it still did (1) sandstones of "Trias-Jura" age; (2) upper sandy beds of the Rolling Downs Formation; (3) lateritic cappings of Rolling Downs kaolinic sandstones; and (4) gravel waste from Tertiary (?) stream channels. Dunstan (1916a) deplored the necessity of using the term since it was "applicable to as many as five different geological horizons." Dunstan (1916b) placed the series in the Tertiary, but pointed out that this was restricting the usage of the term, as the deposits previously included ranged from the Tertiary to the Jurassic, and that many of them were therefore embraced in his Rolling Downs Marine Series or in his Walloon Series. Jensen (1925) used the term and stated that its age was best regarded as "Cretaceo-Tertiary." Reid (1929) reported that the term had been abandoned by the Geological Survey as having no stratigraphical significance. Whitehouse (1940) used the term Glendower Series for Daintree's original Desert Sandstone as developed in the type area—the basin of the Flinders River. Of the term Desert Sandstone he wrote, "It were better, as virtually has been done, to abandon the use of it."

R. Daintree: Q.J.G.S., 1872, p. 275.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

N. Taylor: Report of Hann's Expedition, 1872.

J. E. Tenison-Woods: P.R.S., N.S.W., 1882, p. 6; Proc. Linn. Soc., N.S.W., 1883, p. 55.

R. L. Jack: A.A.A.S., 1, 1889, pp. 204-5.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3 and p. 511 *et seq.*

B. Dunstan: Qld. Min. Index, 1913, pl. 0; Q.G.S.P., No. 254, 1916a, Introduction; Harrap's Geography, 1916b, p. 165.

E. C. Saint-Smith: Second Artesian Water Conference, 1914, p. 20.

H. I. Jensen: Q.G.M.J., 1925, p. 461.

J. H. Reid: Rept. Fifth Artesian Water Conference, 1929, p. 30.

F. W. Whitehouse: Qld. Univ. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 61.

DILLY LIMESTONE (Jensen, 1923).—

A marine horizon with associated glacial beds in the Lower Bowen Series as developed north of Springsure. Correlated with the Pelican Creek limestone of the Bowen coalfield.

This horizon was later included by Reid (1930) in his Dilly Marine Stage; he disagreed with Jensen's correlation with the Pelican Creek (Big Strophalosia) horizon.

H. I. Jensen: Proc. Linn. Soc., N.S.W., 1923, p. 155.

J. H. Reid: Q.G.M.J., 1930, p. 95; Q.G.S.P., No. 278, p. 90.

DILLY MARINE STAGE (Reid, 1930).—

A predominantly marine stage, including *Ewrydesma cordatum* horizon, with interbedded fresh-water and glacial beds within the Lower Bowen Series as developed in the Springsure district.

Reid (1932) stated that with certain reservations "*Productus* (?) *subquadratus, Linoproductus springsurensis* and *Eurydesma* [*cordatum*] appear restricted to the Dilly Stage in the Springsure district." *Aviculopecten mitchelli* he regraded as also indicative of Dilly age. On the presence of this suite he correlated the Homevale Bed (Mt. Britton), Saltbush Park (Nebo), Yatton and Cracow with the Dilly Stage. Hazlewood Creek and Blenheim, Camboon Woolshed and Delusion Creek were also tentatively correlated. Sussmilch (1935) placed it as the lowermost part of the Lower Permian. Hill (1943) correlated it tentatively with the Yatton Limestone, placing it in the Artinskian or possibly on the Basleo horizon of the Middle Permian.

J. H. Reid: Q.G.M.J., 1930, p. 95; Q.G.S.P., No. 278, 1930, pp. 68, 90; P.R.S.Q., 43, 1932, pp. 58, 60, 61.

C. A. Sussmilch: A.N.Z.A.A.S., 20, 1935, p. 85.

D. Hill: P.R.S.Q., 54, 1943, Table opp. p. 64.

DINESUS STAGE (Whitehouse, 1930).—

The upper of the two stages of the Templeton Series. "These beds represent a stage in the lower half of the Middle Cambrian."

Whitehouse (1931) placed this stage as stratigraphically beneath the horizon of the *Leiagnostus* Stage of the Georgina Limestones and (1936) immediately above an interposed *Inouyella* Stage of his Templeton Series. It was correlated with the *Ctenocephalus exsulans* zone of Europe. It formed also the uppermost Stage of his *Kootenia* Group. He (1941) included it in his *Xystridura* zone.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 27; Ann. Rept., Dept. Mines for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, pp. 73, 78; 11, 1939, pp. 264-265; 12, 1941, p. 2.

DINNER CREEK SERIES (Reid and Morton, 1928).—

A fresh-water series of conglomerates, sandstones and shales with interbedded volcanic rocks conformably overlying the Stanwell Marine Series. The series which contains *Glossopteris browniana, Gangamopteris* and *Sphenophyllum* was assigned to the Upper Carboniferous. This represents the lowest horizon of the *Glossopteris* flora yet discovered in Queensland.

Whitehouse (1930) placed the series in the Permo-Carboniferous below the Lower Bowen Volcanics. Reid (1930) showed the DINNER CREEK STAGE as the lowest "stage" of his Lower Bowen and stated that in the type area it is separated by an important stratigraphical break from the underlying Neerkol (Stanwell Marine) Series. David (1932) assigned the series to the lower part of the Upper Carboniferous and older than the Gympie Series, but in an addendum stated that the latest evidence favoured placing all Kamilaroi strata, including this series, in the Permian. Sussmilch (1935) placed the series in the Uralian.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, pp. 385, 388.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 33.

J. H. Reid: Q.G.S.P., No 278, 1930, pp. 39, 53, 56.

T. W. E. David: Explanatory Notes, 1932, Table D.

C. A. Sussmilch: A.N.Z.A.A.S., 20, 1935, p. 85.

DIPROTODON BEDS (Bryan, 1928).—

Suggested name for the older alluvial deposits containing fossil remains of giant and other marsupials of Pleistocene age.

These beds have been referred to by various authors as DIPROTODON BRECCIAS (Daintree, 1872), Older Alluvial (Gregory, 1879), Fossil Drift (Gregory, 1879), and Bone Drifts (Jack and Etheridge, 1892). David (1932) also placed these beds in the Pleistocene.

R. Daintree: Q.J.G.S., 28, 1872, p. 274.

W. H. Bryan: Glossary of Qld. Stratigraphy, Univ. of Qld., 1928, p. 26.

T. W. E. David: Explanatory Notes, 1932, Table I.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

A. C. Gregory: Qld. Parl. Papers, 1879.

DOOLOOGARAH SERIES (Whitehouse, 1940).—

A local serial name for fresh water sandstones, conglomerates and white shales, occurring as a marginal fringe to the Great Artesian Basin. It lies conformably below the Attica Series.

Whitehouse (1942) stated that this is equivalent to and consequently absorbed in the "standard" Bundamba Series. But Whitehouse (1940) had included in this series the Galah Gorge Beds and the Betts Creek Series of Reid, although he assigned these to the late Permian or early Triassic.

F. W. Whitehouse: Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, pp. 36, 59, 61; P.R.S.Q., 53, 1942, p. 13.

DOTSWOOD BEDS (Jack, 1886).—

Jack (1879) had described as the Dalrymple and Dotswood Series, unfossiliferous sediments which he assigned to the Middle Devonian, owing to his "belief in its intermediate position between the horizon of the Star beds and that of the Burdekin Downs limestone."

Jack (1886) included similar beds occurring in Keelbottom Valley (near Dotswood in the Fanning Valley) containing the plant *Dicranophyllum australicum.* He regarded these beds as equal in systematic importance to the Burdekin Beds below and the Gympie Beds above. Jack (1889) as a result of fossil evidence included the Dotswood Beds in his Star Beds of Carboniferous age although he considered that they are separated by a notable break in sequence. The Beds "directly and to all appearance conformably" succeed "the Fanning limestone" of Middle Devonian age, but he added that "the apparent passage . . . . must be deceptive." Jack and Etheridge (1892) placed the lower part of these Beds with *Dicranophyllum australicum* in the Middle Devonian Burdekin Series, but since the upper part was correlated with their Star Beds of Permo-Carboniferous age and since they regarded their Gympie Formation as intermediate in age between the Burdekin Series and the Star Beds they argued that there must be an important non-sequence between the lower and upper parts of the Dotswood Beds. (For this and other reasons the term was later abandoned as a serial name.) Reid (1930) reinterpreted the relationship as follows: "Everything—lithology, fauna, structure—points to the Dotswood beds being the basal Star beds in that district, and that there is just a normal and conformable sequence from the Middle Devonian limestone of the Burdekin to the Lower Star (Upper Devonian) of the type districts and thence to the Upper Star (Lower Carboniferous).

R. L. Jack: Q.G.S.P., No. 1, 1879, p. 13, Map No. 2; Hbk. Qld. Geology, 1886, p. 31; A.A.A.S., 1, 1889, pp. 199, 200.

R Etheridge, Senr.: Proc. Roy. Phys. Soc., Edin., 1880, p. 4.

R. L. Jack and R. Etheridge, Jun.: Geol. of Qld., 1892, pp. 39, 132.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 80.

DOUGLAS CREEK LIMESTONES (Hill, 1939).—

A marine horizon in the Clermont district, within the Peak Downs Series (Dunstan, 1916) containing rugose corals. Assigned to the upper part of the Couvinian, and correlated with the Drummond Creek Limestone.

Jones (1942) found that the tabulate corals also indicated an Upper Couvinian age. Hill (1943) stated "The Clermont Limestones would appear to . . . . be on a slightly higher horizon than the Silverwood limestones."

D. Hill: P.R.S.Q., 50, 1939, p. 56; 54, 1943, p. 60 and Table.

O. A. Jones: P.R.S.Q., 53, 1942, p. 41.

DRIFTS (? MIOCENE) (Jack and Etheridge, 1892).—

One of their several Tertiary Formations. See Deep Leads.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

DRIFTS (? PLIOCENE) (Jack and Etheridge, 1892).—

One of their several Tertiary Formations. See Deep Leads.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

DRUMMOND CREEK LIMESTONE (Hill, 1939).—

A marine horizon in the Clermont district within the Peak Downs Series (Dunstan, 1916) containing rugose corals. Assigned to the upper part of the Couvinian and correlated with the Douglas Creek Limestones.

Hill (1943) stated these "limestones would appear to . . . . be on a slightly higher horizon than the Silverwood limestones."

[Not to be confused with Drummond Beds of Jack and Etheridge, 1892.]

D. Hill: P.R.S.Q., 50, 1939, p. 56; P.R.S.Q., 54, 1943, p. 60 and Table.

DRUMMOND SERIES (Jack and Etheridge, 1892).—

Gently inclined sandstones and shales along the Drummond Range and Belyando River, referred to as the DRUMMOND BEDS. Regarded by them as equivalents of the Star Series and hence assigned to the Permo-Carboniferous.

Etheridge (1891) although he did not use either term had referred to the occurrence of *Lepidodendron australe* in the strata and placed them in the Carboniferous period. Jack and Etheridge (1892) placed it in the Permo-Carboniferous. When Dunstan (1916) removed the "Star Series" *q.v.* from the Permo-Carboniferous to the Carboniferous the Drummond Series, which was still regarded as equivalent, also became Carboniferous. Jensen (1923) stated that in the Drummond Range area these beds lie unconformably below the Lower Bowen Series. Reid and Morton (1928) placed the beds (to which they gave the name Drummond Series) as older than the Rockhampton Series and within the Lower Carboniferous. Whitehouse (1930) referred to Lower Carboniferous beds within the series containing *Lepidodendron* and "upper beds" with *Rhacopteris*. The whole series with the possible exception of the lowermost beds he assigned to the Carboniferous. Reid (1930) equated them with the Star Series assigning the lower division with *Lepidodendron australe* to the Upper Devonian and the upper division with abundant *Lepidodendron veltheimianum* (and probably equivalent beds with *Aneimites* (*Rhacopteris*) *austrina*) to the lower Carboniferous; and stated that a marked unconformity separates the Drummond Beds and the overlying Lower Bowen Series. David (1932) agreed in the main with Reid but extended the range upwards, thus placing the beds with *Aneimites* within the lowermost part of the Upper Carboniferous.

R. Etheridge: Rec. Geol. Surv., N.S.W., 1891, p. 134.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 138.

B. Dunstan: Harrap's Geography, 1916, p. 170.

H. I. Jensen: Proc. Linn. Soc., N.S.W., 1923, p. 154.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 388.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 30.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 10, 21, 83.

T. W. E. David: Explanatory Notes, 1932, p. 52, Table D.

DUARINGA-EMERALD SERIES (Reid and Morton, 1928).—

Several hundred feet of fresh water sediments and interbedded basalts lying unconformably on the Bowen Formation and regarded as "Tertiary to Post Tertiary."

Dunstan (1916) had included these beds in his more comprehensive Duaringa Series. David (1932) assigned the 1,000 feet of "ostracod and sporangia shales" at Duaringa to the Oligocene.

B. Dunstan: Harrap's Geography, 1916, p. 165.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 388.

T. W. E. David: Explanatory Notes, 1932, Table I.

DUARINGA SERIES (Dunstan, 1916).—

Sediments with resin-bearing clay shales, containing fish remains found at Duaringa, The Narrows, and Lowmead. One of the many equivalent series assigned by him to the Tertiary.

David (1932) described them as "ostracod and sporangia shales" and assigned them to the Oligocene. Hills (1943) after an examination of an incomplete collection of fossil fish wrote "it is possible to state only that they are Tertiary."

See Nerang-Duaringa Series, Casuarina-Narrows Series and Duaringa-Emerald Series.

B. Dunstan: Ann. Prog. Rept., Geol. Surv. Qld. for 1900, 1901, pp. 16, 17; Harrap's Geography. 1916. p. 165.

T. W. E. David: Explanatory Notes, 1932, Table I. and p. 88.

E. S. Hills: Mem. Qld. Mus., 12, 1943, p. 99.

DUCHESS-GLENORMISTON SERIES (David, 1932).—

A marine series with a *Pagodia* Stage overlying a *Proceratopyge* Stage; ranging from the top of the Middle Cambrian to the bottom of the Ordovician.

[Not to be confused with the Glenormiston Series of Ordovician age.]

T. W. E. David (*fide* F. W. Whitehouse): Explanatory Notes, 1932, p. 37.

DURICRUST (Woolnough, 1927).—

The relatively hard crust formed during the great period of peneplanation in many widely separated areas of Australia in Tertiary times. Included much of the so-called "Laterite" and "Desert Sandstone" of Queensland. Regarded as of stratigraphical significance since it constituted a once-continuous formation of approximately Miocene age.

For a different interpretation of its stratigraphical significance see Laterites (Tertiary), (Whitehouse, 1940).

W. G. Woolnough: Proc. Roy. Soc., N.S.W., 1927, p. 51.

E

EIGHT MILE CREEK BEDS (Richards and Bryan, 1925).—

The uppermost division of their Fault Block Series of Permo-Carboniferous age in the Silverwood-Lucky Valley area. "The beds although perfectly conformable fall naturally into two groups; a lower, about 2,400 feet thick, made up of alternating shallow marine and fresh water deposits, and an upper, of approximately equal thickness, composed entirely of volcanic lavas and tuffs mostly of an acid nature." They are correlated with the Rhyolite Range Beds and in part with the Condamine Beds and regarded as younger than the Wallaby Beds of the same series.

Reid (1930) correlated the upper part (volcanics) with his Lower Bowen Series and the lower part (with *Glossopteris* shales) tentatively with his Dinner Creek Series. Voisey (1935) agreed with Reid on the former point. Voisey (1936, 1939) stated that the Fault Block Series as a whole is "to be considered as Lower Permian in age."

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 67.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 68.

A. H. Voisey: P.R.S.Q., 46, 1935, p. 60 *et seq.*; Proc. Linn. Soc. N.S.W. 1936, p. 163; 1939, p. 389.

EINASLEIGH SERIES.—

The gneisses, schists, and other very metamorphosed rocks of this area have never constituted an official "series," but Bryan (1926) has suggested that they represent one of the oldest formations in the State. He regarded them tentatively as the equivalents of the Cloncurry Series of Pre-Cambrian age.

Whitehouse (1930) placed the EINASLEIGH GNEISSES (with the Dargalong Gneisses) in the older of two groups, both of which he considered may reasonably be assigned to the Pre-Cambrian.

W. H. Bryan: P.R.S.Q., 37, 1926, p. 9.

F. W. Whitehouse: Qld. Hbk. A.A.A.S., 1930, p. 24.

ELATHRIELLA STAGE (Whitehouse, 1936).—

A stage near the base of the Pituri Series. The only palaeontological stage recognised within the series. It was shown as stratigraphically succeeding the uppermost *Pagodia* stage of the Georgina Limestone. It was correlated with the *Orusia lenticularis* zone of Europe.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, p. 78; 11, 1939, pp. 264-65.

ELGIN DOWNS BEDS (Reid, 1930).—

Fresh-water beds in the Clermont district with *Calamites sp.* and a species of *Lepidodendron* of Carboniferous type, placed by Reid (1930) in his Upper Star Formation (Lower Carboniferous).

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 28.

ELLESMEREOCERAS STAGE (Whitehouse, 1936).—

A stage near the top of the Ninmaroo Series, being the only palaeontological stage recognised within the series. Assigned to the Ozarkian and regarded as the highest recorded stage in the Cambrian of Queensland.

Kobayashi (1940) placed the "ELLESMEREOCEROID ZONE" in the Tremadocian considering it to be the oldest fossiliferous Ordovician horizon known in Australia.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, p. 78.

T. Kobayashi: Jap. Jour. Geol. and Geog., 17, 1940, p. 123.

EMERALD SERIES.—

See Duaringa-Emerald Series (Reid and Morton 1928).

EMU PARK PHOSPHATIC SCHISTS (Richards and Bryan, 1928).—

A series of metamorphic rocks occurring to the north and east of Rockhampton, conformably underlying their Broadmount Manganiferous Schists and equated with the Phosphatic Schists, of the Brisbane Schist Series, and assigned to the Silurian.

[Equivalent to the oldest part of the Emu Park Series of Whitehouse.]

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

EMU PARK SERIES (Whitehouse, 1928).—

Equivalent to that portion of the Rannes, Emu Park and Anakie Series (Reid and Morton, 1928) in the Rockhampton area.

[This series is more comprehensive than the Emu Park Phosphatic Schists since it includes also several higher horizons.]

F. W. Whitehouse: Q.G.M.J., 1928, p. 441.

ESK-BIARRA SERIES (Jensen, 1926).—

Synonymous with the Esk Series except that he stated that "the 'Esk-Biarra Series' may include the Bundamba in part."

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 22.

ESK SERIES (Reid, 1923).—

Term first used to distinguish the beds in the vicinity of Esk from the Walloon Series on the one hand and the Ipswich Series on the other.

For many years the strata constituting this series were regarded as part of the Walloon Series, e.g. Marks (1912) and were assigned to "Trias-Jura." Walkom (1918) considered the fossil evidence as supporting this and hence included the beds under discussion in the Walloon Series which he referred to the Jurassic. Reid (1923) thought there were "strong palaeontological breaks" between the Walloon Series, the Esk Series and the Ipswich Series. Reid and Morton (1923) divided the series into the Andesitic Stage, the Esk Shales (and equivalent Bellevue Conglomerates) and the Esk Trachytes in ascending order and proposed the correlation of the Esk Series with the Ipswich Series both of which they assigned to Upper Triassic. Walkom (1924) confirmed the correlation and assigned the series to a Rhaetic age. Hill (1930) placed the series in the Keuper. She differed from Reid and Morton in inserting an Acid Tuff Stage between the Andesitic Boulder Beds and the Esk Shales and in excluding the Esk Trachytes. She correlated the upper part of the Esk Series with the lower part of the Ipswich Series. Hill (1931) used the names Lower Esk Series for the Andesitic Boulder Beds and Upper Esk Series for the Acid Tuff Stage and Esk Shales. David (1932) used the term "Esk Stage" for the time interval during which the upper part of the Esk Series and the equivalent (lower) part of the Ipswich Series were deposited.

J. H. Reid: P.R.S.Q., 34, 1923, p. 168.

E. O. Marks: Q.G.M.J., 1912, p. 322.

A. B. Walkom: Proc. Linn. Soc., N.S.W., 1918, p. 78; Mem. Qld. Mus., 8, Pt. 1, 1924, p. 77.

J. H. Reid and C. C. Morton: Q.G.M.J., 1923, pp. 7-14.

D. Hill: P.R.S.Q., 41, 1930, pp. 169, 186; 42, 1931, p. 33.

T. W. E. David: Explanatory Notes, 1932, p. 75 and Table F.

ESK SHALES (Reid and Morton, 1923).—

The middle of their three divisions of the Esk Series and the equivalent of their Bellevue Conglomerates.

Hill (1930) regarded these as the *highest* stage of the Series, lying immediately above the Acid Tuff Stage and equivalent to the Bellevue Conglomerates, and equated them with the Basal Ipswich conglomerates.

J. H. Reid and C. C. Morton: Q.G.M.J., 1923, p. 7.

D. Hill: P.R.S.Q., 41, 1930, p. 186.

ESK STAGE (David, 1932).—

This term was intended to cover both the lower part of the Ipswich Series and the equivalent upper part of the Esk Series. Assigned to the Keuper.

David stated in a footnote that "The abundance of *Schizoneura* in this Esk Stage has suggested to some observers that this Stage may be Lower Triassic."

[This should not be confused with the Esk Series of which it forms only a part.]

T. W. E. David: Explanatory Notes, 1932, p. 75 and Table F.

ESK TRACHYTES (Reid and Morton, 1923).—

Regarded by these authors as the highest horizon of the Esk Series.

Richards (1926) thought that the placing of these within the Esk Series was wrong. He favoured a Kainozoic age rather than a Mesozoic age. Hill (1930) regarded these as intrusive and probably of Tertiary age.

J. H. Reid and C. C. Morton: Q.G.M.J., 1923, p. 7.

H. C. Richards: A.A.A.S., 17, 1926, p. 287.

D. Hill: P.R.S.Q., 41, 1930, p. 178.

ETHERIDGE (Daintree, 1872).—

One of the ten areas grouped as "Metamorphic" and assigned to the Pre-Devonian.

Cameron (1900) described these beds as an unfossiliferous series of very evenly stratified slate, mica schists, micaceous sandstones and quartzites of unknown age. Jensen (1920) *excluded* these from his Etheridgean Series and (1923) correlated them with his (younger) Herberton Series. Later (1925) he suggested that they might represent metamorphosed Cambrian sediments.

R. Daintree: Q.G.S.P., 1872, p. 300.

W. E. Cameron: Q.G.S.P., No. 151, 1900, p. 1.

H. I. Jensen: P.R.S.Q., 1920, pp. 25-28; Q.G.S.P., No. 274, 1923, pp. 8, 74, 75; Q.G.M.J., 1925, p. 379.

ETHERIDGEAN SERIES (Jensen, 1920).—

A comprehensive term to include "most of the metamorphic rocks from the Tate River to the Gulf of Carpentaria." In particular it included the older and more strongly metamorphosed rocks of the Etheridge Goldfield, but excluded the less metamorphosed sediments usually associated with the name Etheridge. Assigned to the Pre-Cambrian and correlated with the Cloncurry Series.

Jensen (1923) included in his "Etheridgean Period" his "ETHERIDGE SERIES" of the type district and other correlated series, viz. the Cardross-Muldiva Series of the Chillagoe-Herberton district and an unnamed series in the Croydon area. These Etheridgean series he regarded as forming a Pre-Silurian group, older than those comprising his Herbertonian Series, in which latter group he placed the less metamorphosed rocks of the Etheridge district. Jensen (1925) again suggested a Pre-Cambrian age for the series.

H. I. Jensen: Proc. Roy. Geog. Soc. Qld., 1920, pp. 25-28; Q.G.S.P., No. 274, 1923, pp. 8, 74, 75; Q.G.M.J., 1925, p. 379.

ETNA SERIES (Whitehouse, 1928).—

A vast thickness of rhyolites and rhyolitic tuffs with interbedded shales, cherts and coralline limestones, assigned to the Devonian and regarded as conformably overlying the Emu Park Series. The type locality is at Mt. Etna, 17 miles north of Rockhampton.

David (1932) placed the series in the Middle Devonian (Givetian) correlating it with the Silverwood Series and the upper part of the Burdekin Series. Hill (1943) on the evidence of the rugose corals assigned the limestones to the Coblenzian. She stated that there can be little difference in age between this and the Silverwood limestones.

F. W. Whitehouse: Q.G.M.J., 1928, p. 441; P.R.S.Q., 40, 1929, p. 134.

T. W. E. David: Explanatory Notes, 1932, Table C.
D. Hill: P.R.S.Q., 54, 1943, pp. 13, 59.

EUGONOCARE STAGE (Whitehouse, 1939).—

New name for the *Anorina* Stage of the Georgina (Cambrian) Series. It lies above the *Anomocare* Stage and below the *Glyptagnostus* Stage and is correlated with the *Agnostus pisiformis* zone of Europe.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1939, pp. 264-65.

EUROSTINA STAGE (Whitehouse, 1939).—

New name for the *Inouyella* Stage of the Templeton (Cambrian) Series. It lies above the *Amphoton* Stage and below the *Dinesus* Stage and is correlated with the *Triplagnostus atavus* zone of Europe.

Whitehouse (1941) included it in his more comprehensive *Xystridura* Zone.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1939, pp. 264-65; 12, 1941, p. 2.

EURYDESMA BEDS (Richards and Bryan, 1925).—

Over 200 feet of shallow-water marine sediments (containing the *Eurydesma cordatum* horizon) forming the lowest beds of the Fault Block Series of Permo-Carboniferous age in the Silverwood-Lucky Valley area.

Reid (1930) placed them as *younger* than the Condamine Beds of the same series and correlated them with his Lower Bowen Series. Voisey (1935) agreed with Reid on this point. Voisey (1936, 1939) stated the Fault Block Series as a whole is "to be considered Lower Permian in age."

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 67.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 68.

A. H. Voisey: P.R.S.Q., 46, 1935, p. 60, *et seq.* (see also p. xiv); Proc. Linn. Soc., N.S.W., 1936, p. 163; 1939, p. 389.

EURYDESMA CORDATUM HORIZON (Richards and Bryan, 1925).—

Shown as a definite horizon within their *Eurydesma* Beds and used as a basis for correlation.

Reid (1930) regarded *Eurydesma cordatum* as characteristic of his Lower Bowen as a whole and of definite dianostic value. Reid (1932) wrote of a "MAIN EURYDESMA HORIZON," sometimes glacial, as forming the lowest known member of his Dilly Stage of the Lower Bowen. David (1932) regarded it as the criterion in determining the base of the Bowen Series and indeed the base of the Permian in Queensland. The horizon "is known from Silverwood, near Warwick, to at least as far north as Yatton, over 400 miles, and from Springsure to near Broadsound, about 130 miles." Whitehouse (1935) disagreed with the assumption that this species was necessarily restricted to one horizon.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 69.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 64; P.R.S.Q., 43, 1932, p. 58.

T. W. E. David: Explanatory Notes, 1932, p. 64, and Table E.

F. W. Whitehouse: P.R.S.Q., 46, 1935, p. xiv.

EURYDESMA GLACIAL HORIZON (Reid, 1930).—

An horizon within the Dilly Marine Stage of the Lower Bowen Series as developed in the Springsure district.

Reid (1932) pointed out that some other occurrences of this his "Main *Eurydesma* horizon" do not contain evidence of glaciation.

J. H. Reid: Q.G.M.J., 1930, p. 151; P.R.S.Q., 43, 1932, p. 60.

EYRIAN SERIES (Whitehouse, 1930).—

Fresh-water beds of Tertiary age continuous with those of the Eyrian stage of South Australia. In some places they rest "apparently unconformably on the Winton Series," while in others "they rest with a definite unconformity upon the marine beds of the Roma and Tambo Series."

David (1932) assigned them tentatively to the Eocene, but in part to the post-Eocene.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 39.

T. W. E. David: Explanatory Notes, 1932, Table I.

F

FANNING LIMESTONE (Jack, 1889).—

Relatively undisturbed, fossiliferous limestones within the Burdekin Formation, lying conformably beneath his Dotswood Beds; assigned to the Middle Devonian. David (1932) treated the 7,000 feet of coralline limestones with the Burdekin Series and assigned them to the Givetian division of the Middle Devonian.

Hill (1942) assigned it to the middle section of the Givetian, and correlated it with the limestones of Burdekin Downs and Reid Gap.

[Not to be confused with the Fanning River Beds of Jensen (1925).]

R. L. Jack: A.A.A.S., 1, 1889, pp. 198, 199.

T. W. E. David: Explanatory Notes, 1932, Table C.

D. Hill: P.R.S.Q., 53, 1942, p. 229; 54, 1943, p. 61 and Table.

FANNING RIVER BEDS (Jensen, 1925).—

Virtually synonymous with Dotswood Beds.

[Not to be confused with Fanning Limestone, Jack (1889) which they overlie.]

H. I. Jensen: Q.G.M.J., 1925, p. 381.

FAULT BLOCK SERIES (Richards and Bryan, 1925).—

A series composed of several isolated blocks of marine and fresh water strata and associated volcanics of Permo-Carboniferous age occurring in the Silverwood-Lucky Valley area. The individual blocks were called "Eight Mile block," "Tunnel Block," "Stanthorpe Road Block" and "Condamine Block" respectively.

Whitehouse (1930) used the name in a far more general sense to include somewhat similar blocks at Silverspur, Cressbrook Creek, Gympie, Cania and Lakes Creek in addition to those at Silverwood. "In all these areas are to be found beds containing an interesting fauna with genera characteristic of Lower Bowen beds." Voisey (1936, 1939) stated that the series as a whole is "to be considered Lower Permian in age."

For more detail see Eurydesma Beds, Wallaby Beds, Condamine Beds, Eight Mile Creek Beds, Rhyolite Range Beds.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 60.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, p. 33.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 51.

A. H. Voisey: P.R.S.Q., 46, 1935, p. 60 *et seq.* (see also p. xiv); Proc. Linn. Soc. N.S.W., 1936, p. 163; 1939, p. 389.

FERNVALE JASPERS (Richards and Bryan, 1928).—

Jaspers, in part radiolarian, in the Brisbane River valley, assigned to the Lower Devonian and correlated with the jaspers of the Boyne River.

Denmead (1927) included them in his Fernvale Series.

H. C. Richards and W. H. Bryan: A.A.A.S., 18 (1926 meeting) 1928, p. 288.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103.

FERNVALE SERIES (Denmead, 1928).—

The uppermost of the four Series into which the Brisbane Schists are divided. The series includes radiolarian jaspers, andesitic tuffs, banded cherts, shales, claystones, and limestones with associated serpentine. The series was referred tentatively to the Devonian.

David (1932) assigned the "FERNVALE SCHISTS" to the Lower Devonian. Ball (1934) reported fossiliferous marine rocks of late Palaeozoic age from Northbrook in juxtaposition with the Fernvale Series and associated with andesitic volcanics which he regarded as part of that series, thus implying a late Palaeozoic age for part at least of the Fernvale Series.

[Insofar as the age of this series is based on correlation with the Woolomin Series of New South Wales it is affected by the latest views on the age of the latter which assign it to the Pre-Devonian. (See Brown, 1942).]

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103.

T. W. E. David: Explanatory Notes, 1932, Table C.

L. C. Ball: Q.G.M.J., 1934, p. 37.

I. Brown: P.R.S. N.S.W., 76, 1942, p. 176.

FIRST BED OF SLATE (Rands, 1889).—

An important horizon within the Gympie Series consisting of 15 feet of black shales.

Rands realised that these lay *beneath* the Phoenix Slates (with which the miners had wrongly equated them) but decided to retain a well established, if misleading, term. Dunstan (1912) included this horizon in his *Second* Slate Group.

W. H. Rands: Q.G.S.P., No. 52, 1889, p. 3.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

FIRST SLATE GROUP (Dunstan, 1912).—

The uppermost of his three slate groups in the Middle Gympie Formation. It contains a persistent fossiliferous horizon shown as I.F.

Approximately equivalent to Rands (1889) Phoenix Slates, but does not include Rands' First Bed of Slate.

W. H. Rands: Q.G.S.P., No. 52, 1889, p. 3.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

FIRST VOLCANIC (GREYWACKE) GROUP (Dunstan, 1912).—

The uppermost volcanic group of his Middle Gympie Formation.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

FOSSIL DRIFT (A. C. Gregory, 1879).—

Synonym for his Alluvial Older. See *Diprotoden* Beds.

A. C. Gregory: Qld. Parliamentary Papers, 1879.

FOUR-FOOT SANDSTONE (Cameron, 1907).—

A readily traceable horizon overlying his "Bundamba shales" within the Ipswich Series.

W. E. Cameron: Q.G.S.P., No. 204, 1907, p. 20.

FROME SERIES (Jensen, 1940).—

Schists, quartzites, metagneiss, granulites, etc. in the Palmer River district. Assigned to the Archaeozoic.

H. I. Jensen: A.G. & G.S. of N.A., Rept. to Dec. 1939, 1940, p. 20.

G

GALAH GORGE BEDS (Reid, 1916).—

Freshwater sediments with coal seams and containing *Glossopteris;* correlated with the Betts Creek Series and assigned to the Permo-Carboniferous.

Whitehouse (1940) assigned these to the late Permian or early Triassic, and included them in his Dooloogarah Series.

E. O. Marks: Q.G.S.P., No. 235, 1911, pp. 18-20.

J. H. Reid: Q.G.S.P., No. 254, 1916, p. 17.

F. W. Whitehouse: Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 59.

GATCOMBE HEAD SERIES (Bryan, 1926).—

"Very highly metamorphosed and crushed schists and gneisses of a very old aspect" regarded as lying unconformably below Dunstan's (1916) Gladstone-Curtis Island Series and assigned tentatively to the Pre-Cambrian.

H. I. Jensen: Q.G.M.J., 1918, p. 10.

W. H. Bryan: P.R.S.Q., 37, 1926, pp. 10, 11.

GEORGINA LIMESTONES (Ogilvie, 1931).—

Grey limestones with trilobites and other fossils, around the basin of the Georgina River.

Whitehouse (1931) divided these into three stages, in ascending order *Leiagnostus, Proceratopyge* and *Pagodia* Stages. These range in age from the upper portion of the Middle Cambrian to the upper portion of the Upper Cambrian. Whitehouse (1936) divided the "GEORGINA SERIES" into six stages which, in ascending order were the *Phoidagnostus, Anomocare* and *Solenopleura* Stages which he bracketed as the *Phalacroma* Group and assigned

to the Acadian and the *Anorina*, *Glyptagnostus* and Pagodia stages which he bracketed as the *Proceratopyge* Group and placed in the Croixian. The uppermost of these stages is succeeded by the *Elathriella* Stage of the Pituri Series. Grabau (1937) divided the series into the Lower Georgina Limestone which he placed in his Middle Cambrian Pulsation System and the Upper Georgina Limestone in his Cambrovician Pulsation System. He argued that these two parts are separated by a "Probable Hiatus and Disconformity." Whitehouse (1939) saw "no reason for postulating such a break." He added the *Agnostus seminula* Stage at the base of the series, and the *Papyriaspis* Stage between the *Phoidagnostus* and *Anomocare* Stages. He deleted the *Solenopleura* Stage and proposed the new names *Eugonocare* Stage for *Anorina* Stage and *Rhodonaspis* Stage for *Pagodia* Stage.

C. Ogilvie: in F. W. Whitehouse: Ann. Rept. Dept. Mines Qld., for 1930, 1931, p. 141.

F. W. Whitehouse: Ann. Rept. Dept. Mines, Qld., for 1930, 1931, p. 141. Mem. Qld. Mus. 11, 1936, pp. 75, 78, 80; 11, 1939, pp. 264-5, 268.

A. W. Grabau: Palaeozoic Formations in the Light of the Pulsation Theory, 3, pt. 2, 1937, pp. 371-2.

GIGOOMGAN LIMESTONE (Rands, 1890).—

A great mass of bluish grey limestone traced for at least 14 miles. Assigned to the Gympie Formation of "Carbonifero-Permian" age.

Richards and Bryan (1932) described it as "at least eleven hundred feet thick" and "made up almost entirely of algal remains." They cited Whitehouse's opinion that the associated fauna is typically "Permo-Carboniferous" and that it represents the upper part of the Upper Carboniferous. David (1932) tentatively placed it as near the *Eurydesma cordatum* horizon at the base of the Lower Permian.

W. H. Rands: Q.G.S.P., No. 59, 1890, p. 1.

H. C. Richards and W. H. Bryan: Geol. Mag., 1932, pp. 295, 300.

T. W. E. David: Explanatory Notes, 1932, p. 634, Table E.

GILBERT (Daintree, 1872).—

One of the ten areas assigned by Daintree to his oldest or "Metamorphic" group of Pre-Devonian age.

R. Daintree: Q.J.G.S., 1872, p. 300.

GLADSTONE-CURTIS ISLAND SERIES (Dunstan, 1916).—

A series of slates, schists, quartzites, and jasperoids. A northern equivalent of the Brisbane Schist Series. Assigned doubtfully to Ordovician. Dunstan (1904) had divided these and the associated rocks in the neighbourhood into the following "Belts": (1) Limestone and slate Belt; (2) Serpentine Belt; (3) Phosphate-bearing Slate Belt. Jensen (1918) referred to other more metamorphosed members of the series below (3) at Gatcombe Head. Dunstan (1920) modified this arrangement into belts as follows: (1) Serpentine and Limestone; (2) Manganiferous Schists; (3) Phosphate-bearing Schist. He pointed out that these divisions still held as the series was traced to the south. Bryan (1926) regarded the Gatcombe Head rocks as belonging to an older series, possibly Pre-Cambrian. Richards and Bryan (1928) assigned the Manganiferous Schists and jaspers to the Lower Devonian and the phosphatic schists to the Silurian. David (1932) placed the Manganiferous Schists in the Lower Devonian.

B. Dunstan: Q.G.SP, No. 190, 3, 1904, p. 10; Harrap's Geography, 1916, p. 174; Q.G.S.P., No. 268, 1920, Art. 8.

H. I. Jensen: Q.G.M.J., 1918, p. 10.

W. H. Bryan: P.R.S.Q., 37, 1926, p. 11.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

T. W. E. David: Explanatory Notes, 1932, Table C.

GLENDOWER SERIES (Whitehouse, 1940).—

"A most curious sedimentary series, arenaceous and non-calcareous in type, consisting mainly of sandstones and conglomerates but with some white shales as well." Developed in the Flinders River valley. It overlies Cretaceous beds and underlies the later lateritic soils. This term is virtually synonymous with Daintree's Desert Sandstone as originally defined in this, the type area.

F. W. Whitehouse: Univ. of Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, pp. 57, 58, 61.

GLENORMISTON SERIES (Whitehouse, 1930).—

A series of arenaceous and calcareous sediments of unknown thickness of Ordovician age with a rich fauna of a shelly facies found in the Toko Range (Cairns Range) in the extreme west of Queensland.

Jack (1896) had correlated the beds in question with similar strata in Central Australia. As the latter were thought by some authorities to be Silurian and by others Ordovician, Jack hesitated to assign the Queensland beds definitely to either period. Jack (1899) had included them (together with the Cloncurry Series) in a large area of North-western Queensland to which he assigned a Silurian age. For many years the idea persisted that the fossiliferous beds under consideration formed part of the great Cloncurry Series and that the latter was consequently of Silurian age (e.g. Dunstan, 1916). The discovery of Cambrian fossils, however, in the Templeton Series definitely proved that much of the Cloncurry Series was of Pre-Cambrian age. Bryan (1927) had pointed out that as the beds of the Cairns Range could still reasonably be correlated with the strata in Central Australia, and as the latter had in the interim been definitely proved to be Ordovician, the Cairns Range sediments should also be regarded as of Ordovician (probably Caradocian) and not of Silurian age. Whitehouse (1931) suggested a Lower Ordovician age. David (1932) placed the series as partly Lower and partly Upper Ordovician. Whitehouse (1936) proposed the term ''Toko Series'' to replace ''Glenormiston Series,'' since ''although the series occurs on Glenormiston, the greater part of that property is occupied by Cambrian beds.'' See Toko Series.

R. L. Jack: P.R.S.Q., 12, 1896, p. 48; Geol. Map of Qld., 1899.

B. Dunstan: Harrap's Geography, 1916, p. 174.

W. H. Bryan: P.R.S.Q., 38, 1927, pp. 90-91.

F. W. Whitehouse: Qld. Hbk. A.A.A.S., 1930, p. 27; Ann. Rept. Dept. Mines, 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, p. 68.

T. W. E. David: Explanatory Notes, 1932, p. 28.

GLYPTAGNOSTUS STAGE (Whitehouse, 1936).—

One of the six stages into which he divided the Georgina Limestones of Cambrian age. It immediately underlies the uppermost, *Pagodia* Stage, and was correlated with portions of the *Olenus* zone of Europe.

Whitehouse (1931) had previously divided the series into three other stages but had not recognised this one. Whitehouse (1939) showed it as immediately above the *Eugonocare* [*Anorina*] Stage and below the *Rhodonaspis* [*Pagodia*] Stage.

F. W. Whitehouse: Ann. Rept. Dept. Mines Qld. for 1930, 1931, p. 141. Mem. Qld. Mus., 11, 1936, p. 78; 11, 1939, pp. 264-65.

GOODNA SANDSTONE (Richards, 1919).—

A medium grained sandstone within the Bundamba Series and once used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 119.

GOOMERI VOLCANICS AND KINBOMBI BOULDER BEDS (Reid, 1925).—

The middle of his three Mesozoic formations in the Murgon-Goomeri district lying conformably above his Manyung Series and conformably below his Mondure Series. Listed as Triassic ?.

J. H. Reid: Q.G.M.J., 1925, p. 87.

GOOROOMJAM (Daintree, 1872).—

One of the ten areas assigned by Daintree to his oldest or ''Metamorphic'' group of Pre-Devonian age.

R. Daintree: Q.J.G.S., 1872, p. 300.

GORDON DOWN BEDS (Etheridge, Senr. 1872).—

The lower of his two ''Oolitic'' series.

These beds form part of Whitehouse's (1926) Roma Series.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

GRAHAM'S CREEK SERIES (Bryan and Massey, 1926).—

A term proposed for a very considerable thickness of tuffs and tuffaceous sediments which separates the Tiaro Series (Jurassic) below from the Maryborough Series (Cretaceous) above.

David (1932) placed it as equivalent in age to the uppermost part of the Walloon Series, probably in the Lower Cretaceous but possibly in the uppermost Jurassic.

W. H. Bryan and C. N. Massey: P.R.S.Q., 37, 1926, p. 112.

T. W. E. David: Explanatory Notes, 1932, p. 27 and Table H.

GREENSTONE SERIES (Denmead, 1928).—

The series consists almost entirely of altered basic rocks, probably porphyrites and basalts. It is the lowest of the four series into which he divided the Brisbane Schists and is overlain by his Bunya Series. The series was assigned doubtfully to the Silurian.

David (1932) wrote of the "GREENSTONE SCHIST SERIES" that "Its age may lie between Proterozoic and Ordovician." He assigned it tentatively to Newer Proterozoic.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103.

T. W. E. David: Explanatory Notes, 1932, p. 36.

GREY RANGE.—

Certain metamorphic rocks of an ancient facies in the museum of the Queensland Geological Survey are reported to have been found in this area of south-western Queensland. As a result Jack (1892) suggested that the area might be of Cambrian age, while Etheridge (1892) thought it might be even older. Dunstan (1913) referred to very metamorphosed rocks from the locality. Geologists more recently in the area have failed to find any trace of these old metamorphic rocks.

R. L. Jack and R. Etheridge: Geol. of Qld. 1892, p. 20, and footnote, p. 390.

B. Dunstan: Qld. Min. Index, 1913, p. 537.

GUNNEVIN STAGE (Jensen, 1929).—

Sandstones forming the lower stage of the Big Sandstone of his Middle Walloon as developed in the Roma district. It is overlain by limey shales which in turn are overlain by his Bymount Stage.

H. I. Jensen: Q.G.M.J., 1929, p. 283.

GYMPIE GREENSTONE (Jack, 1888).—

An horizon within the Gympie Series as developed in the type district.

Later included by Dunstan (1912) in his Third Volcanic (Diabase) Group.

R. L. Jack: Min. Wealth of Qld., 1888, p. 37.

W. H. Rands: Q.G.S.P., No. 52, 1889, pp. 3, 4.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

GYMPIE SERIES (Daintree, 1872).—

The use of this term has given rise to a great deal of confusion in Queensland stratigraphy. The confusion has resulted from (1) differences of opinion as to the age of the series as developed in the type district; (2) differences as to its stratigraphical position with regard to other Queensland formations (particularly the Star and the Bowen); (3) the extension of the meaning of the term to include a host of different rock types lying far distant from the type locality. Aplin (1868) had regarded the beds of the Gympie gold-field as "probably Upper Silurian." Clarke (1871) had referred the GYMPIE BEDS "to some part of the Carboniferous formation." Daintree and Etheridge (1872) placed them as the lower of their two Devonian series (the upper one being the Star River Series). McCoy (1874) regarded the series as Lower Carboniferous. A. C. Gregory (1875) referred them to the Devonian. Jack (1886) followed McCoy, but later (1889) correlated the strata of the Gympie Goldfield with the "Bowen River Beds" and thus concluded that the former were "Carbonifero-Permian" in age. Jack and Etheridge (1892) used the term in a very much more comprehensive sense than any previously adopted, including in their "GYMPIE FORMATION" many areas that had been regarded as Devonian. The "GYMPIE BEDS" as thus redefined by them are now known to have a great stratigraphic range and included among others the formations now known as (1) Chillagoe Series (Silurian), (2) Brisbane Schists (now regarded tentatively as lower Palaeozoic), (3) Cawarral-Raglan Series (Devonian), (4) Silverwood Series (Devonian), (5) Rockhampton Series (Carboniferous), (6) Silver Valley Beds (Carboniferous), (7) Gympie Series, in the restricted sense, (Permo-Carboniferous). The whole formation was treated as the lowest of five, all of which were placed within the "Permo-Carboniferous." Directly above the Gympie Formation was the Star Formation which was succeeded in its turn by the three Bowen Formations. Dunstan (1912, 1913) divided the Gympie Formation into (1) Upper Gympie Series, (2) Middle Gympie (Gold) Series, (3) Lower Gympie Series, (4) Gympie (General). Of these the Middle Gympie (Gold) Series was the development in the type area and contained Permo-Carboniferous fossils, while Gympie (General) included many areas since proved to be Carboniferous, Devonian or older. The whole of the Gympie Formation was placed *above* the Star Series, which, however, was still regarded as of Permo-Carboniferous age. Dunstan (1916) replaced much of his Gympie (General) by the Rockhampton Series and his Herberton Series, both of which he regarded as of Carboniferous age. His Lower Gympie was also assigned tentatively to this period. The Middle Gympie in the type district was

placed in a new Lower Marine Series, while part of the Upper Gympie was tentatively placed in the new Lower Coal Measures, both the new series being assigned (with two others) to the Permo-Carboniferous. Reid (1930) used the term "for a formation that he considered transitional between the Lower Carboniferous and the Permo-Carboniferous." Of the GYMPIE (TRANSITION) SERIES, the Gympie auriferous beds (with strong Permo-Carboniferous faunal elements) represent only the upper portion, for which the name Monkland Series was proposed, the earlier part being comprised by the Stanwell Marine Series (with the first representatives of the Permo-Carboniferous fauna) for which he proposed the name Neerkol Series as a substitute. The palaeontological criteria on which this arrangement was based automatically limited the upward range of the series and excluded many formations hitherto attributed to "Gympie." The Lower Gympie of Dunstan, to which Reid did not give a serial name, he regarded as "including equivalents of much of the Neerkol Series as well as the Rockhampton Series." David (1932) placed the series (in Reid's sense) in the Upper Carboniferous, younger than the Dinner Creek Series but older than the Lower Bowen Series. But in an addendum he stated that the latest evidence favoured placing all Kamilaroi strata, including this series, in the Permian. Sussmilch (1935) placed it in the Upper Culm, but, following Reid, older than the Dinner Creek Series.

C. D. O'H. Aplin: Qld. Leg. Council Journals, 11, 1868, p. 449.

W. B. Clarke: Progress of Gold Discovery from 1860 to 1871, 1871, pp. 5-7; Quoted in Remarks on the Sedimentary Formations of New South Wales, 4th Ed., 1878, pp. 18, 19.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

F. McCoy: Prodomus Pal. Vict., 1874, p. 38.

A. C. Gregory: Qld. Parl. Papers, 1875, 2, p. 923.

R. L. Jack: Hbk. Qld. Geol., 1886, map; A.A.A.S., 1, 1889, p. 202.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, pp. 72-128.

B. Dunstan: Q.G.S.P., No. 221B, 1912; Qld. Min. Index, 1913, Pl. 0; Harrap's Geography, 1916, p. 168 *et seq.*

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 10.

T. W. E. David: Explanatory Notes, 1932, Table D.

C. A. Sussmilch: A.N.Z.A.A.S., 20, 1935, p. 85.

GYPSEOUS MARINE STAGE (Reid, 1930).—

A stage of gypseous and magnesian shales and sandstones occurring within the Lower Bowen Series as developed in the Springsure district.

J. H. Reid: Q.G.M.J., 1930, p. 98.

H

HALYSITES LIMESTONE (David, 1932).—

Virtually synonymous with Chillagoe Series.

T. W. E. David: Eplanatory Notes, 1932, p. 92.

"HAWKESBURY" TYPE SANDSTONE (Reid, 1928).—

See Carborough Series.

J. H. Reid: Q.G.M.J., 1928, pp. 193, 236.

HELICIDAE LIMESTONE (David, 1914).—

A series occurring to the west of Cloncurry and listed as Post Tertiary.

Chapman (1937) referring to this as "HELIX SANDSTONE" placed it tentatively as early Pleistocene. Whitehouse (1940) included it in his later siliceous limestones of Pliocene age.

See Limestones (Tertiary).

T. W. E. David: B.A.A.S., 1914, p. 255.

F. Chapman: A.N.Z.A.A.S., 23, 1937, p. 98.

F. W. Whitehouse: Univ. Qld. Papers Dept. Geol. 2 (n.s.), No. 1, 1940, pp. 27, 28, 71.

HELIDON SANDSTONE (Richards, 1919).—

A sandstone within the Bundamba Series largely used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 123.

HELIDON SERIES (Dunstan, 1915).—

A series of massive sandstones regarded as equivalent to the Bundamba Series and assigned doubtfully to the Triassic period.

Dunstan (1916) extended the geographical scope of the Bundamba Series as a result of which the Helidon Series was absorbed.

B. Dunstan: Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 167.

HERBERTONIAN SERIES (Jensen, 1920).—

Schists, slates and greywackes of the Herberton, Irvinebank, and Koorboora districts. Regarded as older than the Hodgkinson Series (in his restricted sense) and assigned tentatively to the Ordovician.

Jensen (1923) placed the series above his pre-Silurian Etheridgean Series and below the Silurian Chillagoe Series.

[This series should not be confused with Dunstan's Herberton Series. They both regard the strata near Herberton as typical but there resemblance ends. The beds of the Hodgkinson area, which form an important part of Dunstan's Herberton, are relegated to a special supposedly younger series, the Hodgkinson Series, by Jensen.]

H. I. Jensen: Proc. Roy. Geog. Soc. Qld., 1920, p. 25; Q.G.S.P., No. 274, 1923, p. 75.

HERBERTON SERIES (Dunstan, 1916).—

A term to embrace many rock types sometimes fossiliferous, found occurring at Herberton, Irvinebank, Newellton, Coolgarra, Mt. Albion, Mt. Garnet, Koorboora, Thornborough, Mt. Molloy, Mt. Carbine, Palmerville, Maytown, Annan River, and Cooktown. Regarded as the tentative equivalent of the Star Series and assigned to the Carboniferous.

Jack (1889) used the term Hodgkinson Beds in much the same sense, and he also correlated them with the Star Series and referred them to the Carboniferous. Jack and Etheridge (1892) included the same area within their very comprehensive Gympie Formation of Permo-Carboniferous age. Stirling (1904) pointed out that the Silver Valley (Newellton) Beds should be considered as a younger (Carboniferous) series than the beds of the Hodgkinson and Palmer Gold Fields which he considered Devonian. Dunstan (1913) treated the whole area as part of his "Gympie (General) Series" (Permo-Carboniferous), but (1916) used the term Hodgkinson Series in the sense of Jack to cover the same area, assigning the series tentatively to a Carboniferous age. Jensen (1920) followed Stirling in so far as he regarded the Newellton strata of Carboniferous age and younger than the remaining sedimentaries, but he went further in dividing the latter into a Hodgkinson Series of Devonian age and a Herbertonian Series of Pre-Silurian age. Bryan (1926) followed Stirling without modification.

[This Herberton Series should not be confused with Jensen's Herbertonian.]

B. Dunstan: Qld. in. Index, 1913, Pl. 0; Harrap's Geography, 1916, p. 171.

R. L. Jack: A.A.A.S., 1, 1889, p. 200.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 113.

J. Stirling: Monograph on Silver Valley, 1904.

H. I. Jensen: Proc. Roy. Geog. Soc. Qld., 1920, p. 25.

W. H. Bryan: P.R.S.Q., 37, 1926, p. 20.

HERBERTON SERIES (Jensen, 1923).—

Synonym for his Herbertonian Series.

[Not to be confused with the Herberton Series of Dunstan 1916.]

H. I. Jensen: Q.G.S.P., No. 274, 1923, pp. 8, 75.

HIGELDY GRAVELS WITH ERRATICS (Skertchly, 1908).—

Term applied to gravels "becoming almost conglomerate on exposure. Not water-sorted." Supposed to have been deposited from floating ice. Lowest horizon of Skertchly's Brisbane Tertiaries.

S. B. J. Skertchly: Qld. Naturalist, 1908, p. 51.

HIGHFIELDS SANDSTONE (Richards, 1919).—

A sandstone within the Bundamba Series used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 129.

HIGH LEVEL RIVER AND LAKE DRIFTS (Jack and Etheridge, 1892).—

One of the Post-Pliocene Formations listed by them.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

HODGKINSON BEDS (Jack, 1888).—

A series of sediments in part fossiliferous extending over the Hodgkinson and Palmer Goldfields. Regarded as representing the unconformity between the "Burdekin Beds (Devonian) and the overlying 'Star Beds.'"

Jack (1889) correlated them tentatively with the Star Beds and assigned them to the Carboniferous. Jack and Etheridge (1892) recorded *Pachypora sp.*, *Cyathophyllum sp.* and *Lepidodendron australe* and included these beds in their very comprehensive Gympie Formation which was placed below the Star Formation, but assigned with it to the Permo-Carboniferous. Dunstan (1913) included them in his "Gympie (General) Series" and assigned them to the Permo-Carboniferous. Dunstan (1916) included them as an important part of his Herberton Series which he placed tentatively in the Carboniferous. Ball (1917) on account of the great break, stratigraphical and palaeontological, between the series and the overlying Permo-Carboniferous, placed it in the Carboniferous. Jensen (1920) used the name Hodgkinson Series q.v. in a restricted sense, assigning it to the Devonian. Reid (1930) (referring to the Hodgkinson Beds of Jack as the "HODGKINSON SERIES" stated that the fossil evidence pointed to their being for the most part Lower Star, and therefore Upper Devonian but possibly ranging from Middle Devonian to Lower Carboniferous. He stated that the series is separated by a strong unconformity from the overlying Mulligan Series of Permo-Carboniferous age.

R. L. Jack: Mineral Wealth of Qld., 1888, p. 17; A.A.A.S., 1, 1889, p. 5.

B. Dunstan: Qld. Min. Index, 1913, pl. 9; Harrap's Geography, 1916, p. 171.

L. C. Ball: Q.G.M.J., 1917, p. 448.

H. I. Jensen: Proc. Roy. Geog. Soc. Qld., 1920, p. 25.

J. H. Reid: Q.G.S.P., No. 278, 1930. pp. 23, 78.

HODGKINSON SERIES (Jensen, 1920).—

A series of sediments in the Hodgkinson gold field assigned by him to the Devonian.

The term as thus defined is not a synonym for Jack's Hodgkinson Beds as it is used in a more restricted sense by omitting the Silver Valley (Newellton) Beds, which Jensen regarded as Carboniferous, and the Herberton area which he thought Pre-Silurian.

[N.B. The term Hodgkinson Series has also been used by Reid (1930) and others as a synonym for the Hodgkinson Beds of Jack.]

H. I. Jensen: Proc. Roy. Geog. Soc. Qld., 1920, p. 25.

HOMEVALE BED (Reid, 1932).—

A fossiliferous marine bed at Mt. Britton, correlated with the Dilly Stage of his Lower Bowen.

J. H. Reid: P.R.S.Q., 43, 1932, p. 60.

HORIZON I.F. (Dunstan, 1912).—

A greenish sandstone and tuff in his First Slate Group of the Middle Gympie Formation containing abundant marine fossils.

Reid (1930) regarded this as an important horizon within his Monkland Series.

B. Dunstan: Q.G.S.P., No. 221B, 1912.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 43, 53.

HUGHENDEN BEDS (Etheridge, Senr., 1872).—

The middle of his three "Cretaceous" beds (all of which overlie the "Oolitic" of Wallumbilla).

[These are now absorbed in the Tambo Series (Whitehouse, 1927).]

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

I

INJUNE CREEK (CALCAREOUS) BEDS (Jensen, 1923).—

Fresh-water beds in the Roma area correlated with the Rosewood Stage of the Walloon Series.

H. I. Jensen: Proc. Linn. Soc. N.S.W., 1923, p. 157.

INOUYELLA STAGE (Whitehouse, 1936).—

One of the four stages into which he divided the Templeton (Cambrian) Series; shown as immediately above the *Amphoton* Stage and below the *Dinesus* Stage and correlated with

the *Diplagnostus atavus* zone of Europe. It forms also the middle of the three stages of his *Kootenia* Group.

Whitehouse (1939) replaced the name by *Eurostina* Stage.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, pp. 73, 74, 78; 11, 1939, pp. 264-65.

IPSWICH FORMATION (Jack and Etheridge, 1892).—

A comprehensive term embracing all those fresh-water deposits assigned by them to the Upper division of the "Trias-Jura." In addition to the Ipswich Coal Measures, it included those of Walloon, Darling Downs, Stewart's Creek (Rockhampton), Wycarbah, and Rosewood (Rockhampton). This Formation was supposed to be younger than the Burrum Formation, which was assigned to "Lower Trias-Jura."

The term was abandoned by Cameron (1907) principally because he regarded the Ipswich Formation and the Burrum Formation to be equivalent formations and continuous in the field. He substituted for the Ipswich Formation in the type district two "Stages," the lower of which he styled the Ipswich Beds (regarded as the equivalent of the Burrum Beds) and the Upper Stage the Walloon Beds (including the coal measures of the Darling Downs).

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 321.

W. E. Cameron: Q.G.S.P., No. 204, 1907, pp. 12-17.

IPSWICH INSECT BED (Dunstan, 1923).—

An important horizon near the top of the Ipswich Series as developed in the type area.

B. Dunstan: Q.G.S.P., No. 273, Introduction.

IPSWICH SERIES (Jack, 1886).—

Terms commonly used as synonyms are IPSWICH COAL MEASURES, IPSWICH COAL SERIES, IPSWICH BEDS, IPSWICH STAGE. Name given to the Ipswich coal measures and certain supposed equivalents. Then regarded as Jurassic.

Gregory (1879) had placed the Ipswich coal beds as "Carbonaceous" (*q.v.*) within the Mesozoic, but noted that the coals and associated fossils of the Walloon area were newer in type than those of Ipswich itself. Tenison-Woods (1883) had regarded the series as Jurassic. Jack and Etheridge (1892) abandoned the term Ipswich Beds for the more comprehensive Ipswich Formation which was referred to the "Upper Trias-Jura." Cameron (1899) while accepting this made use of the term Ipswich Beds in a restricted geographical sense, and divided them into Basal Conglomerate and Coal-bearing Beds. Later Cameron (1907) abandoned the term Ipswich Formation and restricted the name Ipswich Beds to the coal measures proper extending from Ipswich to Goodna (the later coal measures to the west of Ipswich being distinguished as the Walloon Beds). Closely associated with Cameron's Ipswich Beds were his Basal Conglomerates below, and his Bundamba Grits above. Dunstan (1913) assigned the Ipswich Series to the lowest of his three divisions of the Trias Jura and correlated it with the Tiaro Series and with the Styx Series. David (1914) referred to the Ipswich Coal Measures as Upper Jurassic. Dunstan (1915) referred the Ipswich Series to the Triassic as a result of Walkom's (1915) palaeobotanical determinations and placed the Brisbane Tuffs and Coorparoo Conglomerates successively below them although many previous workers had explicity or implicitly regarded these horizons as being included within the Ipswich Series. Dunstan (1916) redefined the Ipswich Coal Series as very productive coal measures at Ipswich, Bundamba, Tivoli, Tingalpa, Brisbane River, Nundah, and Caboolture, and divided the series into four "Belts" which were, in descending order (1) Bundamba Steam Coal Belt, (2) Cooneanna Sandstones, (3) Tivoli Coking Coal Belt, and (4) Basal Conglomerates. The whole series he regarded as ? Triassic. The Brisbane Tuffs he still treated as a separate series. Walkom (1918) on palaeobotanical grounds placed the series in the Rhaetic. Reid and Morton (1922) separated the Ipswich Series which they regarded as of Upper Triassic age from a supposed lower series which they named the Borallon Series. Jensen (1923) used the term "Ipswich Series" in a much wider sense geographically than had previously been the custom and placed it as Lower Triassic. Hill (1930) correlated the Ipswich and Esk Series in part, and considered the Ipswich-Esk flora to be of Keuper age. David (1932) placed the series in the Keuper.

R. L. Jack: Handbook of Qld. Geology, 1886, Map.

A. C. Gregory: Qld. Parl. Papers, 1879, p. 369.

J. E. Tenison-Woods: Proc. Linn. Soc. N.S.W., 1883, p. 54.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

W. E. Cameron: Q.G.S.P., No. 147, 1899, p. 3; No. 204, 1907, p. 12 *et seq.*

B. Dunstan: Qld. Min. Index, 1913, Pl. 0; Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 168.

A. B. Walkom: Q.G.S.P., No. 252, 1915, p. 37; Proc. Linn. Soc. N.S.W., 1918, p. 95.

J. H. Reid and C. C. Morton: Q.G.M.J., 1922, p. 258.

H. I. Jensen: Proc. Linn. Soc. N.S.W., 1923, p. 157; Q.G.S.P., No. 277, 1926, p. 22.

D. Hill: P.R.S.Q., 41, 1930, p. 186.

T. W. E. David: Explanatory Notes, 1932, Table F.

IPSWICH-TIARO-STYX SERIES (Dunstan, 1913).—

The lowest of the three "Trias-Jura ?" series listed.

[This all-too-comprehensive name was based upon the assumption that the Ipswich Series, the Tiaro Series and the Styx Series are of the same age, whereas at the present day they are regarded as belonging to three different periods, viz., Triassic, Jurassic, and Cretaceous.]

B. Dunstan: Qld. Min. Index, 1913, Pl. 0.

J

JURASSIC FLORAL STAGES (Whitehouse, 1932).—

See Triassic and Jurassic Floral Stages.

K

KALKADOON-ARGYLLA SERIES (Honman, 1936).—

A series of schists, gneisses, amphibolites and gneissic granites of older Archaeozoic age, being the oldest rocks in the Cloncurry district. It comprises the Argylla Series, the Leichhardt Series (which name he discarded) and the Kalkadoon Series, all of which he regarded as of approximately the same age. They lie unconformably beneath the Soldier's Cap Series of Newer Archaeozoic age.

See Cloncurry Series.

C. S. Honman: A.G. & G.S. of N.A. Rept., Dec. 1935, 1936, p. 49; A.G. & G.S. of N.A. Qld., No. 8, 1937, p. 3; No. 19, 1937, p. 5.

E. O. Rayner: A.G. & G.S. of N.A. Qld., No. 10, 1936, p. 5.

KALKADOON SERIES (David, 1932).—

A series of gneisses assigned (with the associated Leichhardt Series) to the Archaeozoic.

Honman (1936) included it in his composite Kalkadoon-Argylla Series of Older Archaeozoic age.

See Cloncurry Series.

T. W. E. David: Explanatory Notes, 1932, p. 31.

C. S. Honman: A.G. & G.S. of N.A., Rept., Dec. 1935, 1936, p. 49.

KAMILAROI SYSTEM (David, 1931).—

A term originally proposed for the Permo-Carboniferous strata in the Hunter River district in New South Wales, and later (1932) used for equivalent beds throughout Australia, including those of Queensland. See Permo-Carboniferous.

[This term has not been generally adopted in Queensland Stratigraphy.]

T. W. E. David: A.N.Z.A.A.S., 20, 1931, p. 66; Explanatory Notes, 1932, p. 61 and Table E.

KANGAROO HILLS SERIES (Saint-Smith, 1922).—

Quartzites, slates, mudstones, grits and limestones with interbedded andesites and rhyolites. Assigned to the Upper Devonian.

Reid (1931) recorded a wide-angled unconformity between the Kangaroo Hills Series and the Star beds (*q.v.*) and correlated the former with his Metalliferous Series which he assigned to the Upper Silurian.

E. C. Saint-Smith: Q.G.M.J., 1922, p. 312-3.

J. H. Reid: Q.G.M.J., 1931, p. 265.

KENILWORTH PHYLLITES (Jensen, 1910).—

Highly foliated metamorphic rocks of the upper Mary River. No age was assigned except the statement that they were older than the "True Gympie" (Permo-Carboniferous).

These beds were later included by Dunstan (1916) in his Amamoor Series.

[They may be the equivalents of Denmead's (1928) Bunya Series of the Brisbane Schists.]

H. I. Jensen: A.A.A.S., 12, 1910, p. 262.

B. Dunstan: Harrap's Geography, 1916, p. 174.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 72.

KILKIVAN (Daintree, 1872).—

One of the ten areas which he placed in his oldest or "Metamorphic" group of Pre-Devonian age.

The rocks of this area were later regarded by Jack and Etheridge (1892) as belonging to their comprehensive Gympie Series of Permo-Carboniferous age. Dunstan (1916) included them in his Kilkivan Serpentine Series, *q.v.*

R. Daintree: Q.J.G.S., 1872, p. 300.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 83.

B. Dunstan: Harrap's Geography, 1916, p. 173.

KILKIVAN SERPENTINE SERIES (Dunstan, 1916).—

Massive serpentine, serpentine schists and clay schists. "Relation to associated rocks unknown." Correlated with his Canoona-Cawarral Serpentine Series and his Pine Mountain Serpentine Series. Tentatively assigned to the Devonian.

See Kilkivan.

B. Dunstan: Harrap's Geography, 1916, p. 173.

KILLARNEY COAL MEASURES (David, 1932).—

A term introduced for the Walloon Series as developed in the Darling Downs area. Assigned to the Upper Jurassic. See Darling Downs Series.

T. W. E. David: Explanatory Notes, 1932, Table G.

KINBOMBI BOULDER BEDS (Reid, 1925).—

These, with his Goomeri Volcanics, form the middle division of his three Mesozoic formations in the Murgon-Goomeri district. They lie above his Manyung Series and below his Mondure Series. Assigned to the Triassic?

J. H. Reid: Q.G.M.J., 1925, p. 87.

KIN KIN SCHISTS (Jensen, 1910).—

A synonym in common use is KIN KIN PHYLLITES. Highly foliated metamorphic rocks to the south-east of Gympie. No age was assigned except the statement that they were older than the "True Gympie" (Permo-Carboniferous).

Dunstan (1913) included these schists in his "Upper Gympie" i.e. he placed them *above* the "True Gympie." Denmead (1928) stated that it was generally agreed that these rocks should be correlated with the Brisbane Schists.

H. I. Jensen: A.A.A.S., 12, 1910, p. 262.

B. Dunstan: Qld. Min. Index, 1913, Pl. 5.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 72.

KOOTENIA GROUP (Whitehouse, 1936).—

Comprises the *Amphoton, Inouyella* and *Dinesus* Stages of the Templeton (Cambrian) Series, but excludes the *Redlichia* Stage which lies below.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, p. 73.

L

LAKE'S CREEK BEDS (Reid and Morton, 1928).—

Massive *Fenestella-bearing* mudstones and light grey gritty rocks interpreted as lying disconformably above the Rockhampton Series and correlated with the upper section of the Stanwell Marine Series.

Whitehouse (1928, 1929) disagreed with the correlation and argued "that the fossiliferous beds in the quarry represent an outlier of Permo-Carboniferous beds belonging to the base of the Middle Bowen Series and resting unconformably on the unfossiliferous cherts and grits of the Rockhampton Series." Reid (1930) restated Reid and Morton's case for correlation with part of the Neerkol (Stanwell Marine) Series.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 386.

F. W. Whitehouse: Q.G.M.J., 1928, p. 441; A.AA.S., 19, 1929, p. 75.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 39.

LANDSBOROUGH SERIES (Dunstan, 1915).—

Massive sandstones regarded as equivalent to the Bundamba Series and assigned doubtfully to the Triassic period.

Dunstan (1916) extended the geographical scope of the Bundamba Series as one result of which the Landsborough Series was absorbed. David (1932) placed the LANDSBOROUGH SANDSTONE in the Rhaetic and equivalent to the Bundamba Sandstone.

B. Dunstan: Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 168.

T. W. E. David: Explanatory Notes, 1932, Table F.

LANEFIELD INDEX BED (Reid, 1927).—

An useful horizon below the Lanefield seam of the Rosewood Coal Measures, of Jurassic age. Its lithology is variable but red is the most characteristic colour.

J. H. Reid: Q.G.M.J., 1927, pp. 7, 8.

LATERITES (TERTIARY).—

Whitehouse (1940) stated that in Queensland there were at least two periods of laterite formation in Tertiary times. These he placed provisionally as early and late Pliocene. They are preceded by his Earlier Siliceous Limestones, separated by his Later Siliceous Limestones and followed by him Non-Siliceous Limestones.

F. W. Whitehouse: Univ. Qld. Papers, Dept. of Geol., 2 (n.s.), No. 1, pp. 2, 71.

LATERITIC SANDSTONE (Dunstan, 1913).—

Listed and mapped as the most recent formation in the Charters Towers area.

B. Dunstan: Qld. Min. Index, 1913, Pl. 28.

LAURA (COOKTOWN) SERIES (Dunstan, 1915).—

Name suggested for coal measures regarded as the doubtful equivalent of the Walloon Series.

Dunstan (1916) extended the geographical scope of the term Walloon Series to include the Laura Series which was thus absorbed. David (1932) listed it as one of the Jurassic outliers equivalent to the Walloon Series.

B. Dunstan: Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 167.

T. W. E. David: Explanatory Notes, 1932, p. 81.

LAURA SANDSTONES (Jensen, 1940).—

Sandstones and conglomerates with some shale bands, almost horizontal, unconformably overlying the Maytown Series. In part these resemble Jurassic fresh-water beds to the east [Laura (Cooktown) Series ?] and in part Cretaceous rocks with marine fossils to the north [Walsh River Beds]. Therefore tentatively placed by him as Jura-Cretaceous.

H. I. Jensen: A.G. & G.S. of N.A., Rept. to Dec. 1939, 1940, p. 20, Pl. 1.

LAWN HILL SERIES (Dunstan, 1913).—

A comprehensive series covering a large area, consisting of limestones, shales and sandstones, more or less altered and, in some places, strongly mineralised. Assigned to the Devonian.

The series included massive sandstones of the Constance Range as well as the limestone of Lawn Hill Station, both of which Cameron (1901) had provisionally mapped as Devonian. Ball (1911) had regarded the lower (metalliferous) sediments as lying unconformably below the limestones of the area, all of which he considered Post-Tertiary in age. Dunstan (1916) again used the term in a comprehensive sense but assigned the series tentatively to the Carboniferous and equivalent to the Rockhampton Series. Blanchard in Ball (1931) correlated the metalliferous sediments with lithologically similar rocks at Mt. Isa and consequently regarded them as of Pre-Cambrian age. Shepherd in Ball (1931) agreed with Blanchard and, in addition, stressed the unconformity separating the metalliferous sediments from the limestone above, which he regarded as Cambrian. Jensen (1940) restricted the name Lawn Hill Series to the metalliferous sediments which he equated with the upper portion of the Mount Isa Series of Pre-Cambrian age, "the sequence commencing where the Lochness sequence ended." The overlying unconformable limestone he placed in the Cambrian as part of the Constance Range Series.

W. E. Cameron: Ann. Prog. Rept. of Geol. Surv. Qld. for 1900, 1901, p. 18.

B. Dunstan: Qld. Min. Index, 1913, Pl. 21; Harrap's Geography, 1916, p. 171.

L. C. Ball: Q.G.S.P., No. 232, 1911, pp. 19, 20.

R. Blanchard in L. C. Ball: Q.G.M.J., 1931, p. 263.

S. R. L. Shepherd in L. C. Ball: Q.G.M.J., 1931, p. 263.

H. I. Jensen: A.G. & G.S. of N.A. Rept. to Dec. 1939, 1940, pp. 23, 24.

LEIAGNOSTUS STAGE (Whitehouse, 1931).—

The lowest stage of the Georgina Limestones, lying below the *Proceratopyge* Stage and assigned to the upper portion of the Middle Cambrian. Placed stratigraphically above the *Dinesus* Stage of the Templeton Series. Later, Whitehouse (1936) dropped this term as a result of a more detailed re-arrangement.

F. W. Whitehouse: Ann. Rept. Dept. Mines for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, p. 78.

LEICHHARDT-KALKADOON SERIES (David, 1932).—

Gneisses and schists in the Mt. Isa region, assigned to the Archaeozoic.

Honman (1936) included this in his even more comprehensive Kalkadoon-Argylla series of Older Archaeozoic age.

See Cloncurry Series.

T. W. E. David: Explanatory Notes, 1932, p. 31.

C. S. Honman: A.G. & G.S. of N.A., Rept. Dec. 1935, 1936, p. 49.

LEICHHARDT SERIES (David, 1932).—

Hornblende schists, mica schists and other regionally metamorphosed rocks assigned (with the associated Kalkadoon Series) to the Archaeozoic. The series was stated to be separated from the overlying Argylla Series (also Archaeozoic) by a massive conglomerate.

Honman (1936) discarded the term and included the series in his comprehensive Kalkadoon-Argylla Series of Older Archaeozoic age.

See Cloncurry Series.

T. W. E. David: Explanatory Notes, 1932, p. 31.

C. S. Honman: A.G. & G.S. of N.A., Rept. Dec. 1935, 1936, p. 49.

LILYMERE, ROCKHAMPTON, YAAMBA BEDS (Jensen, 1926).—

One of five areas in Central Queensland listed as containing Middle Carboniferous marine sediments.

Reid (1930) placed the fossiliferous LILYMERE LIMESTONE in the Rockhampton Series.

H. I. Jensen: Q.G.M.J., 1925, p. 422.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 33.

LIMESTONE AND SLATE BELT (Dunstan, 1904).—

The uppermost of the three stratigraphical belts into which he divided the formation now known as the Gladstone-Curtis Island Series.

See also Phosphate-Bearing Slate Belt; Serpentine Belt.

B. Dunstan: Q.G.S.P., No. 190, 1904, p. 10.

LIMESTONE GROUP (Dunstan, 1912).—

The uppermost horizon of his Middle Gympie Formation in the type district. It immediately overlies his Conglomerate Group.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

LIMESTONES (TERTIARY).—

Whitehouse (1940) stated that limestones of non-marine origin were formed in widely separated regions of Queensland, on at least three occasions between Middle Miocene and Pleistocene times. These three limestone series, the first and second siliceous and the third non-siliceous he suggested were formed under semi-arid conditions which alternated with the pluvial epochs during which his Earlier and Later Lateritic soils were formed.

F. W. Whitehouse: Univ. Qld. Papers, Dept. of Geol., 2 (n.s.), No. 1, pp. 23, 71.

LINOPRODUCTUS SPRINGSURENSIS ZONE (Reid, 1932).—

Marine shales, 100 to 140 feet thick, constituting the uppermost beds of his Dilly Stage of the Lower Bowen, as developed at Springsure Dome.

J. H. Reid: P.R.S.Q., 43, 1932, p. 57.

LION CREEK DISCONFORMITY (Reid, 1930).—
Synonym for Stanwell Disconformity.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 34.

LION CREEK LIMESTONE (Whitehouse, 1927).—
An oolitic limestone near Stanwell within the Rockhampton Series assigned to zone D. 2 of the European Carboniferous succession.

Reid and Morton (1928) regarded the limestone as the uppermost bed of the Rockhampton Series, but Whitehouse (1928) included overlying beds in this series. Whitehouse (1930) referred to the contained *Amygdalophyllum* fauna and hence correlated the limestone with part of the *Dibunophyllum* zone [D_2] of the Visean of Europe. David (1932) suggested the possibility that the horizon is D_3. Hill (1934) on the evidence of the rugose corals placed the limestone as the equivalent of the D_2 horizon of the Visean, but probably earlier than the Riverleigh Limestone. Hill (1943) correlated it with the Riverleigh, Cania and Cannindah Limestones, assigning it to the Upper Visean or possibly Moscovian.

F. W. Whitehouse: P.R.S.Q., 1927, p. x.; Q.G.M.J., 1928, p. 441; Hbk. Qld. A.A.A.S., 1930, p. 30.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 386.

T. W. E. David: Explanatory Notes, 1932, p. 59.

D. Hill: P.R.S.Q., 45, 1934, p. 105; 54, 1943, p. 62 and Table.

LITTLE RIVER COAL MEASURES (Jack, 1882).—
A series of fresh-water sediments with interbedded coal seams in the valley of the Little River near Cooktown. Assigned to the Carbonifero-Permian.

Jack and Etheridge (1892) regarded the series as part of their Upper Bowen Formation outside the type district, and thus assigned it to Permo-Carboniferous. David (1932) placed it in the Permian.

R. L. Jack: Q.G.S.P., No. 11, 1882, p. 1.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 172

T. W. E. David: Explanatory Notes, 1932, p. 124.

LOCKYER CREEK SANDSTONES (Richards, 1919).—
A sandstone within the Bundamba Series, once used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 123.

LONE PINE GRAVEL (Bryan, 1938).—
Elevated gravels in the lower part of the Brisbane valley, correlated with the Higeldy Gravels of Skertchly.

W. H. Bryan: Qld. Nat. 10, 1938, pp. 92-3.

LOWER COAL MEASURES (Dunstan, 1916).—
A comprehensive term to embrace outcrops scattered over an enormous area of country containing workable coal seams, all of which were assigned to the Permo-Carboniferous System.

This is one of the four "Series" to which Dunstan (1916) referred all the Permo-Carboniferous beds of Queensland. Below this was the Lower Marine Series, and above it in succession were the Upper Marine Series and Upper Coal Measures.

B. Dunstan: Harrap's Geography, 1916, p. 169.

LOWER CONGLOMERATE STAGE (Reid and Morton, 1922).—
Conglomerates, sandstones, and clay shales which formed the lower division of their Borallon Series.

[This name became obsolete when the term Borallon Series was withdrawn.]

J. H. Reid and C. C. Morton: Q.G.M.J., 1922, p. 358.

LOWER MARINE SERIES (Dunstan, 1916).—
A comprehensive term to embrace fossiliferous tuffs, sandstones, conglomerates, limestones, and shales. Defined in 6 belts, viz: (1) Wide Bay Belt, (2) Eastern Leichhardt Belt, (3) Western Leichhardt Belt, (4) Bowen River, (5) Warwick and Texas, (6) Midge Point (near Mackay). Assigned to the Permo-Carboniferous.

This is the lowest of the four "Series" to which Dunstan (1916) referred all the Permo-Carboniferous beds of Queensland. The others in ascending order were Lower Coal Measures, Upper Marine Series and Upper Coal Measures.

B. Dunstan: Harrap's Geography, 1916, p. 169.

LOWER PLUMBAGO (Dunstan, 1912).—

An horizon in the Conglomerate Group of his Middle Gympie Formation.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

LOWMEAD TERTIARIES (Ball, 1915).—

A series of oil shales and other fresh-water sediments with ostracods and dicotyledons regarded as equivalent to the Redbank Series.

David (1932) placed them in the Oligocene. Chapman (1935) stated that the ostracoda point tentatively to a shallow water marine deposit.

The term is virtually synonymous with Ball's (1915) Baffle Creek Tertiaries.

L. C. Ball: Q.G.S.P., No. 249, 1915, p. 12.

T. W. E. David: Explanatory Notes, 1932, Table I.

F. Chapman: P.R.S.Q., 46, 1935, p. 70.

M

MANGANIFEROUS SCHISTS (Dunstan, 1921).—

The middle of his three divisions of the Brisbane Schists (the upper being the Serpentine and Limestone and the lower the Phosphate-bearing Schist). Assigned to the Ordovician.

Richards and Bryan (1925) placed these schists tentatively in the Silurian below their Radiolarian Jaspers, which they assigned to the Devonian. Richards and Bryan (1928) placed them in the Lower Devonian and correlated them with similar beds at Gladstone and Broadmount. Denmead (1928) included both these formations in his Fernvale Series which he regarded as probably Devonian.

B. Dunstan: Q.G.S.P., No. 268 (Art. 8), 1921.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 135; A.A.A.S., 18, 1928, p. 290.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 102.

MANTUAN PRODUCTUS BEDS (Hill, 1943).—

Marine beds near Mantuan Downs, south-west of Springsure, placed in the Artinskian.

Jensen (1926) had regarded certain fossiliferous beds which may be identical with these as upper Bowen.

[Probably synonymous with Reid's *Productus brachthaerus* Beds.]

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 189 and pl. 1.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 73.

D. Hill: P.R.S.Q., 54, 1943, Table opp. p. 64.

MANYUNG SERIES (Reid, 1925).—

A series of fossiliferous fresh-water sediments. The lowest of his three Mesozoic series in the Murgon-Goomeri district lying conformably beneath his Goomeri-Volcanics and Kinbombi Boulder Beds. Regarded as Triassic and equivalent to the Esk and Ipswich Series.

J. H. Reid: Q.G.M.J., 1925, p. 87.

MARATHON BEDS (Daintree, 1872).—

A series of fossiliferous marine sediments in the Hughenden district. Assigned to the Cretaceous.

Etheridge Senr. (1872) placed these beds in the uppermost of his three divisions of the Cretacous. The Marathon Beds have been included in the comprehensive Rolling Downs Formation by many subsequent writers. Whitehouse (1926) included the beds in his Tambo Series.

R. Daintree: Q.J.G.S., 1872, p. 279.

R. Etheridge Senr.: Q.J.G.S., 1872, p. 325.

F. W. Whitehouse: Mem. Qld. Mus., 8, 1926, p. 222.

MARBURG STAGE (Reid, 1922).—

Name given to sediments, mostly massive sandstones within the Bundamba Series of Triassic age.

Jensen (1923) regarded the MARBURG BEDS as equivalent to the Basal Sandstones (Jurassic) of the Injune district. Whitehouse (1930) appears to have regarded it as the lower part of the Walloon Series of Jurassic age. David (1932) placed his MARBURG SANDSTONE SERIES below the Basal Walloon and assigned it to the Lower Lias. Whitehouse (1942) regarded his Attica Series as equivalent to and absorbed in the MARBURG SERIES.

J. H. Reid: Q.G.S.P., No. 272, 1922, p. 11.

H. I. Jensen: Proc. Linn. Soc. N.S.W., 1923, p. 157.

F. W. Whitehouse: Hbk. Qld. A.A.A.S., 1930, p. 35; P.R.S.Q., 53, 1942, p. 13.

T. W. E. David: Explanatory Notes, 1932, Table G.

MARMOR BANDED CHERTS (Richards and Bryan, 1928).—

Placed in the Middle Devonian, conformably above the Marmor Limestone and correlated with the banded radiolarian cherts which form the upper part of their Silverwood Series.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

MARMOR LIMESTONE (Richards and Bryan, 1928).—

Assigned to the Middle Devonian conformably below the Marmor Banded Cherts and correlated with limestones at Silverwood, Pine Mountain, Boyne River and Cawarral.

Whitehouse (in Bryan and Whitehouse, 1930) included it in his Etna Series.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 289.

W. H. Bryan and F. W. Whitehouse: P.R.S.Q., 41, 1930, p. 136.

MARTINIOPSIS HORIZON (Voisey, 1935).—

An important marine horizon within the Eight Mile Creek Beds of the Fault Block Series. It occurs above the fresh water shales with *Glossopteris indica* and below a great thickness of lavas and tuffs.

A. H. Voisey: P.R.S.Q., 46, 1935, p. 62.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 63.

MARYBOROUGH SERIES (Etheridge, Senr. 1872).—

Synonyms are MARYBOROUGH BEDS and MARYBOROUGH MARINE SERIES. A series of fossiliferous marine sediments assigned to the Cretaceous.

Etheridge Senr. (1872) placed these beds in the lowest of his three Cretacous divisions. Jack and Etheridge (1892) included them in their very comprehensive Desert Sandstone Formation which they regarded as Upper Cretaceous. Dunstan (1913) removed them to the Lower Cretaceous Rolling Downs Formation. Dunstan (1916) elevated them to a separate series, the Maryborough Marine Series, which he regarded as equivalent to the Rolling Downs Marine Series. Whitehouse (1927) assigned the series to the Aptian, and correlated it with that part of the Rolling Downs Formation called by him the Roma Series. Whitehouse (1928) stated "The whole development of the Maryborough marine beds may be correlated with the Australiceratan stage of the Roma Series." David (1932) placed the series (600 feet) within the Aptian and equated it with part of the Roma Series.

[The relationship of these beds to the Burrum Coal Measures *q.v.* was for many years misunderstood.]

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 544.

B. Dunstan: Qld. Min. Index, 1913, Pl. 5; Harrap's Geography, 1916, p. 166.

F. W. Whitehouse: P.R.S.Q., 38, 1927, p. 111; A.A.A.S., 18, 1928, p. 278.

T. W. E. David: Explanatory Notes, 1932, Table H and p. 85.

MAYTOWN SERIES (Jensen, 1940).—

Slates and quartzites in the Palmer River district, representing an extension of the Hodgkinson Series and therefore assigned to the Devonian.

H. I. Jensen: A.G. & G.S. of N.A., Rept. to Dec. 1939, 1940, p. 19.

MEIN BEDS (Morton, 1924).—

Morton, although he did not formally propose this serial name, described shales with Cretaceous lamellibranchs and ammonites alternating with fresh water shales with *Unio*, from the Pascoe River district. They apparently overlie the Plutoville Beds of Jurassic age.

C. C. Morton: Q.G.M.J., 1924, p. 129.

W. H. Bryan and F. W. Whitehouse: P.R.S.Q., 38, 1927, p. 109, text-fig. 3.

METALLIFEROUS SERIES (Reid, 1931).—

A metamorphosed sedimentary series including a thick limestone horizon, occurring in the Kangaroo Hills district and correlated with the Chillagoe Series of Upper Silurian age, but equated with the Kangaroo Hills Series which Saint-Smith (1922) had assigned to the Upper Devonian.

E. C. Saint-Smith: Q.G.M.J., 1922, pp. 312-3.

J. H. Reid: Q.G.M.J., 1931, p. 265.

MICHELINIA LIMESTONE (Hill, 1943).—

An horizon at the base of the Rockhampton Series and on a lower horizon than the Rockhampton *Protocanites* Beds. Assigned to the Tournaisian.

D. Hill: P.R.S.Q., 54, 1943, Table opp. p. 54.

MOGGILL SANDSTONE (Richards, 1919).—

A brown sandstone within the Ipswich (?) Series, used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 121.

MONDURE SERIES (Reid, 1925).—

A series of freshwater sediments, being the uppermost of his three Mesozoic series in the Murgon-Goomeri district lying conformably above his Goomeri Volcanics and Kinbombi Boulder Beds. Regarded as Jurassic (?) and treated as a doubtful equivalent of the Bundamba Series.

J. H. Reid: Q.G.M.J., 1925, p. 87.

MONILOPORA [CLADOCHONUS] HORIZON (Whitehouse, 1928a).—

A restricted horizon at the base of the Middle Bowen Series in the type area and at many other localities, characterised by *Monilopora nicholsoni* in association with *Taeniothaerus* [*Productus subquadratus*] and *"Anidanthus."*

Richards and Bryan (1925) had found *Monilopora* associated with the *Trachypora wilkinsoni* Horizon and commented on its surprising occurrence on so high an horizon. Whitehouse (1928b) stated that it is "At present the only zone which can be defined and recognised" in the Middle Bowen Series. Whitehouse (1929) again referred to its prolific occurrence on a limited horizon which he placed in the Upper Carboniferous. Reid (1930) regarded the species as occurring in both the Gympie Series and the Lower Bowen Series but characteristic of the former. David (1931) regarded the "main *Monilopora* Horizon" as 500 feet below the base of the "main *Eurydesma cordatum* horizon" and marking the top of the Carboniferous in the Springsure area; but *Monilopora nicholsoni* was shown also as occurring at an higher horizon within the Lower Bowen Series of Lower Permian age. David and Sussmilch (1931), while emphasising its restricted range, show it as occurring on two distinct horizons both of Upper Carboniferous age. David (1932) regarded *Monilopora nicholsoni* as restricted to one horizon, below the Lower Bowen Series, and forming the upper limit of the Upper Carboniferous. Bryan (1932) stated that the comprehensive group of fossils assigned to *Monilopora nicholsoni* "covers such a great vertical range that the stratigraphical value of the group as such is negligible." Schuchert (1932) expressed similar views.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 102.

F. W. Whitehouse: A.A.A.S., 18, 1928a, p. 282; Q.G.M.J., 1928b, p. 286; A.A.A.S., 19, 1929, p. 76.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 62, 69.

T. W. E. David: A.N.Z.A.A.S., 20, 1931, pp. 64, 67; Explanatory Notes, 1932, Table E.

T. W. E. David and C. A. Sussmilch: Bull. Geol. Soc. Amer., 42, 1931, p. 515.

W. H. Bryan: P.R.S.Q., 44, 1933, p. 71.

C. Schuchert: Amer. Jour. Sci., 23, 1932, pp. 543-4.

MONKLAND SERIES (Reid, 1930).—

The upper of the two series into which he divided his Gympie (transitional) formation. It includes the Gympie auriferous beds and their palaeontological equivalents and is characteristised by its strong Permo-Carboniferous faunal elements. On palaeontological grounds it is regarded as younger than the Neerkol Series, but both are placed in his Gympie Formation and assigned to the Upper (?) Carboniferous.

[As developed in the type area this is practically synonymous with Jensen's (1910) True Gympie and with Dunstan's (1913) Middle Gympie (Gold) Series.]

H. I. Jensen: A.A.A.S., 12, 1910, p. 259.

B. Dunstan: Qld. Min. Index, 1913, p. 10.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 10.

MONKLAND SLATES (Rands, 1889).—

Also referred to as MONKLAND SHALES. Synonym for Phoenix Slate.

[These are not equivalent to, but form part of Reid's Monkland Series.]

MORVEN BED (Whitehouse, 1927).—

The lowest horizon of Cretaceous Marine beds in Queensland. Assigned to the Simbirskitan Stages of the Hauterivian (Neocomian, Cretaceous).

Whitehouse did not recognise this horizon in his later work.

F. W. Whitehouse: P.R.S.Q., 38, 1927, p. 111.

MOUNT BARNEY BEDS (Richards, Bryan and Whitehouse, 1933).—

An inlier of marine sediments of Carboniferous age correlated with the *Pustula* Horizon.

Sussmilch (1935) equated these with the Monkland Series and the Neerkol Beds and placed them within the Gympie Series. Whitehouse (1937) tentatively correlated these and the Northbrook Beds with the Neerkol Beds.

H. C. Richards, W. H. Bryan and F. W. Whitehouse: P.R.S.Q., 44, 1933, p. 70.

C. A. Sussmilch: A.N.Z.A.A.S., 22, 1935, p. 101.

F. W. Whitehouse: A.N.Z.A.A.S., 23, 1937, p. 430.

MOUNT BRITTON (BASAL) BEDS (Reid, 1930).—

Marine fossiliferous strata placed in his Lower Bowen Series and assigned to the late Upper Carboniferous or Lower Permian.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 68.

MOUNT BRITTON (UPPER) BEDS (Reid, 1930).—

Marine fossiliferous strata placed in his Middle Bowen Series and assigned to the Permian.

David (1931) cited Whitehouse's opinion that the dividing line between the Permian and Carboniferous Formations in Queensland should be drawn at the top of these beds, a conclusion based largely on the occurrence in them of a cephalopod referred tentatively to *Paragastrioceras.*

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 74.

T. W. E. David: A.N.Z.A.A.S., 20, 1931, p. 63.

MOUNT BRUNSWICK MARINE BEDS (Reid, 1929).—

An isolated coastal occurrence in the Mackay-Styx district regarded as a doubtful equivalent of the marine beds in his Middle Bowen.

J. H. Reid: Q.G.S.P., No. 276, 1929, p. 107.

MOUNT CASSIDY LIMESTONE (Reid, 1931).—

A limestone associated with other sediments and volcanic rocks in the Rockhampton district.

Whitehouse (1931a) correlated the contained corals with the fauna of the Fanning and Reid Rivers on the one hand and with the fauna of Raglan and Phillpot Creek on the other. Later Whitehouse (1931b) stated that the Mount Cassidy fauna provides a connecting link between that of the Hodgkinson Series and that of Clermont.

J. H. Reid: Q.G.M.J., 1931, p. 5.

F. W. Whitehouse: Q.G.M.J., 1931a, p. 8; Ann. Rept. Dept. Mines, 1931b, p. 142.

MOUNT CROSBY INSECT BED (Jones, 1927).—

An important horizon near the base of the Ipswich Series.

O. A. Jones: P.R.S.Q., 38, 1927, p. 44.

MOUNT DEVLIN COAL MEASURES (Reid, 1924).—

400 feet of fresh-water sediments with coal-seams forming the middle of the three subdivisions of his Lower Bowen in the Bowen River coalfield. Assigned to the Permo-Carboniferous.

David (1932) while regarding these as older than the Collinsville Coal Measures, placed them both in the lower part of the Middle Bowen and in the upper part of the Lower Permian.

J. H. Reid: Q.G.M.J., 1924, p. 452; 1925, p. 7; Q.G.S.P., No. 276, 1929, p. 49.

T. W. E. David: Explanatory Notes, 1932, p. 65, Table E.

MOUNT DEVLIN VOLCANICS (Reid, 1924).—

A series of tuffs and flows forming the upper of his three subdivisions of the Lower Bowen of the Bowen River coalfield. Assigned to the Permo-Carboniferous.

David (1932) placed these in the lower part of the Middle Bowen and in the upper part of the Lower Permian.

J. H. Reid: Q.G.M.J., 1924, p. 452; 1925, p. 7; Q.G.S.P., No. 276, 1929, p. 49.

T. W. E. David: Explanatory Notes, 1932, p. 70.

MOUNT ETNA SERIES (Whitehouse, 1928).—

Synonym for his Etna Series

MOUNT ISA SERIES (Honman, 1936).—

A little-altered series of sedimentary rock containing large ore deposits, assigned to the older Palaeozoic and regarded as unconformably above the Soldier's Cap Series and unconformably below the Mount Quamby Series. The series embraces both the Mount Isa shales and Corella Series of David.

Honman (1937) stated as an alternative view that "the Mount Isa Series and the Soldier's Cap Series represent the same or closely adjoining horizons in the Pre-Cambrian systems, the essential lithological difference being due to the degree of metamorphism rather than to difference in age." But later in the same report he preferred the former view that the Mount Isa Series lies above the Soldier's Cap Series, but not always unconformably. On Plate 4 the series was divided into Lower (greenstones), Middle (quartzites and shales) and Upper (limestone) divisions. Jensen (1939) described the Mount Isa Series at Lochness as made up of a Lower Quartzite stage (commencing with conglomerates), a Volcanic stage (mainly basic) and an Upper Quartzite stage (with interbedded, chertified shales and limestones). The whole was assigned to the Middle Proterozoic.

C. S. Honman: A.G. & G.S. of N.A., Rept. Dec. 1935, 1936, p. 49; Rept. Qld. No. 19, 1937, pp. 5-7; No. 20, 1938, p. 16; Rept. Dec., 1936, 1937, pp. 60-65, Pl. 4.

H. I. Jensen: A.G. & G.S. of N.A., Rept. to Dec. 1938, 1939, p. 42.

MOUNT ISA SHALES (David, 1932).—

Shales, ribbon-stones and other sediments including black carbonaceous shales "with small annelid-like fossils," assigned to the Older (?) Proterozoic and correlated with the Corella shales.

Honman (1936) included these in his more comprehensive Mount Isa Series.

See Cloncurry Series.

T. W. E. David: Explanatory Notes, 1932, p. 31.

C. S. Honman: A.G. & G.S. of N.A., Rept. Dec. 1935, 1936, p. 49.

MOUNT MULLIGAN COAL MEASURES.—

Although he did not formally propose this serial name, Ball (1912, 1917) described the beds as a fresh-water series including three coal seams and containing a flora in which *Sphenophyllum* is present in association with the *Glossopteris-Gangamopteris* suite. The series which lies with a marked unconformity upon the Hodgkinson Beds and is overlain with a slight unconformity by fresh-water beds with Mesozoic plants, he assigned to the Permo-Carboniferous.

Jensen (1920) included these in his more comprehensive and not synonymous Mulligan Series. David (1932) correlated them with the Collinsville Coal Measures of the Middle Bowen and assigned them to the upper part of the Lower Permian.

L. C. Ball: Q.G.S.P., No. 237, 1912, p. 10, *et seq.*; Q.G.M.J., 1917, p. 448.

H. I. Jensen: Proc. Roy. Geog. Soc. Qld., 1920, p. 27.

T. W. E. David: Explanatory Notes, 1932, Table opp. p. 62.

MOUNT QUAMBY SERIES (Honman, 1936).—

Gently dipping to horizontal beds of arkose and auriferous conglomerates in the Cloncurry district. Assigned to the Newer Proterozoic, lying unconformably above the Mount Isa Series.

Ball (1921) had described under the name Quamby Conglomerates *q.v.* certain beds which he regarded as derived from the Cloncurry Series. These now appear to be included in Honman's Series.

C. S. Honman: A.G. & G.S. of N.A., Rept. Dec. 1935, 1936, p. 50; Rept. Qld., No. 19, 1927, pp. 5, 7.

L. C. Ball: Q.G.M.J., 1921, p. 10.

MOUNT STURT SANDSTONE (Richards, 1919).—

Synonym for Swan Creek Sandstone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 132.

MOUNT TOUSSAINT VOLCANICS (Reid, 1925).—

A series of volcanic rocks and associated sediments, being the lowest of his three subdivisions of the Lower Bowen in the Bowen River coalfield. Assigned to the Permo-Carboniferous.

J. H. Reid: Q.G.M.J., 1925, p. 7.

MOUNT WYATT SERIES (Daintree, 1870).—

A series of sandstones and shales containing *Lepidodendron* and *''Spirifer disjunctus''* referred to the Upper Devonian.

Etheridge Senr. (1872) recorded *Lepidodendron* and *Cyclostigma* and assigned the MOUNT WYATT BEDS to the uppermost part of the Devonian. Etheridge, Junr. (1891) stated ''The evidence for assuming a Devonian age for the Mount Wyatt beds containing *Lepidodendron* is at present unconfirmed and unsatisfactory.'' Reid (1928) divided the series into a lower calcareous group, with *Lepidodendron australe* and *Spirifer sp.* and an upper non-calcareous group, placing the whole series within the Carboniferous and correlating it with the Star beds of the type area. Reid (1929) referred the lower group to the Upper Devonian and the ''entirely conformably upper group'' to the ''Upper Star of Lower-Carboniferous age.'' Whitehouse (1929) identified the fossils of the lower group *Lepidodendron* aff. *australe* and *''Spirifer disjunctus''* indicating an Upper Devonian age. Reid (1930) included the series as part of his Lower Star Formation (of Upper Devonian age) but possibly extending into the Lower Carboniferous. David (1932) placed the series in the Upper Devonian.

R. Daintree: General Rept. on Northern District, p. 6, Qld. Parl. Papers, 1870.

R. Etheridge. Senr.: Q.J.G.S., 1872, p. 324.

R. Etheridge, Junr.: Recs. Geol. Surv. N.S.W., 1891, p. 134.

J. H. Reid: Q.G.M.J., 1928, p. 344; 1929, p. 158; Q.G.S.P., No. 278, 1930, pp. 15, 19.

F. W. Whitehouse: Q.G.M.J., 1929, p. 158.

T. W. E. David: Explanatory Notes, 1932, Table C.

MULGELDIE COAL MEASURES (Reid, 1927).—

A series of fresh-water sediments containing coal seams. Assigned to the Jurassic and regarded as equivalent to the Walloon Series.

J. H. Reid: Q.G.M.J., 1927, p. 183.

MULLIGAN SERIES (Jensen, 1920).—

A term ''applied to a series commenicng with [Mount] Mulligan (Permo-Carboniferous) coal measures, and passing upwards into Triassic, Jurassic and Cretaceous beds.''

[The use of one serial name to cover such a long geological range is very inadvisable and has not been followed by other geologists.]

See Mount Mulligan Coal Measures.

H. I. Jensen: Proc. Roy. Geog. Soc. Qld., 1920, p. 27.

MUNGANA LIMESTONES (Hill, 1943).—

Strata within the Chillagoe Series but containing species of corals which suggest Lower or Middle Devonian horizons. (The principal coral horizon of the Chillagoe Series she assigned to the Ludlovian).

D. Hill: P.R.S.Q., 54, 1943, p. 58 and Table.

MURPHY'S CREEK SANDSTONE (Richards, 1919).—

A sandstone within the Bundamba series commonly used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 128.

MYRTLE CREEK SERIES (Bryan and Massey, 1926).—

The second of the four series into which the geological formation previously known as the Tiaro Series was divided (the name Tiaro Series being thus restricted by them to the coal-bearing strata). The Myrtle Creek Series is made up of lacustrine massive sandstones, and was correlated with the Bundamba Series.

David (1932) placed it in the Rhaetic and equivalent to the Bundamba sandstones.

W. H. Bryan and C. N. Massey: P.R.S.Q., 37, 1926, p. 108 *et seq.*

T. W. E. David: Explanatory Notes, 1932, Table F.

N

NAGOORIN SERIES (Dunstan, 1916).—

A series of sandstones, shales and one thick seam of hydrous black coal occurring near Many Peaks. Listed as Tertiary.

B. Dunstan: Harrap's Geography, 1916, p. 165.

NARROWS TERTIARIES (Ball, 1915).—

A series of oil shales and other fresh-water sediments with ostracods.

Dunstan (1913) had correlated these beds with similar beds at Casuarina and used the name Casuarina-Narrows Series. David (1932) placed them in the Oligocene. Hills (1943) on the evidence of the fish fauna regarded the strata as "probably Miocene."

L. C. Ball: Q.G.S.P., No. 249, 1915, p. 22.

B. Dunstan: Qld. Min. Index, 1913, Pl. 3.

T. W. E. David: Explanatory Notes, 1932, Table I.

E. S. Hills: Mem. Qld. Mus., 12, 1943, p. 99.

NEERKOL SERIES (Reid, 1930).—

The lower of the two series into which he divided his Gympie (Transitional) Formation. It "is exclusively developed" at Neerkol near Stanwell. In this series "the first elements of the Permo-Carboniferous fauna appear to a restricted degree." This series was therefore regarded as older than the Monkland Series but both were placed in his Gympie Formation and assigned to the Upper (?) Carboniferous.

Reid recommended that this name replace Stanwell Marine Series with which it is synonymous. He stated that in the type area the series is separated from the overlying Dinner Creek Series by an important stratigraphical break. David (1932) stated that "Overlying the Visean Rockhampton Series proper, and possibly forming a part of that sequence, is the Marine Neerkol Series, perhaps of late Lower Carboniferous age." Whitehouse (1936) correlated the Cannindah [Upper] Limestone and the Mount Barney beds with this series. Whitehouse (1937) tentatively correlated the Northbrook Beds with the NEERKOL BEDS. Carey and Browne (1938) correlated the Silver Valley Beds with this series assigning them to the Middle Carboniferous.

See Stanwell Marine Series.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 11, 39, 56.

T. W. E. David: Explanatory Notes, 1932, p. 60.

F. W. Whitehouse in A. H. Voisey: Pros. Linn. Soc. N.S.W., 1936, p. 163; A.N.Z.A.A.S., 23, 1937, p. 430

S. W. Carey and W. R. Browne: P.R.S., N.S.W., 71, 1938, p. 602.

NEERKOL-STANWELL BEDS (Jensen, 1925).—

Term to include a series of fossiliferous limestones and other marine sediments of Carboniferous age. See Neerkol Series, Stanwell Marine Series.

[These beds should not be confused with Dunstan's Stanwell Coal Measures in the same area, which consist of fresh-water Mesozoic sediments.]

H. I. Jensen: Q.G.M.J., 1925, p. 422.

NERANG-DUARINGA SERIES (Dunstan, 1913).—

A comprehensive name to embrace several distinct areas of fresh-water sediments of Tertiary ? age which are supposedly contemporaneous.

David (1932) assigned the 1,000 feet of "ostracod and sporangia shales" at Duaringa to the Oligocene. Hills (1943) after the examination of an incomplete collection of fish remains referred them to the Tertiary.

B. Dunstan: Qld. Min. Index, 1913, Pt. 0.

T. W. E. David: Explanatory Notes, 1943, Table I.

E. S. Hills: Mem. Qld. Mus., 12, 1943, p. 99.

NERANLEIGH SERIES (Denmead, 1928).—

Greywackes, banded slates, grits, boulder beds, and quartzites. The highest but one of the four Series into which he divided the Brisbane Schists. The age tentatively assigned was Silurian.

David (1932) stated that it "may represent a pelagic type of Silurian (?) Sedimentation."

[The Neranleigh Series lies between the Phosphatic Schists and Manganiferous Schists of other authors.]

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103.

T. W. E. David: Explanatory Notes, 1932, p. 46.

NEWELLTON BEDS (Reid, 1930).—

Used as a synonym for Silver Valley Beds.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 26.

NINMAROO SERIES (Whitehouse, 1936).—

Fossiliferous Cambrian limestones north-east of Boulia. The series was placed as stratigraphically above the Pituri Series. Much was assigned to the Croixian but the only palaeontological stage recognised (the *Ellesmereoceras* Stage) was placed in to the Lower Ozarkian (Lower Tremadocian).

Kobayashi (1940) placed the *Ellesmereoceras* Stage of this series in the Tremadocian, considering it to be the oldest fossiliferous Ordovician horizon known in Australia.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, pp. 69, 78.

T. Kobayashi: Jap. Jour. Geol. & Geog., 18, 1940, p. 123.

NORMANBY SHALES (Tenison-Woods, 1880).—

Name suggested for certain highly inclined dark carbonaceous shales near Cooktown.

[The name was never adopted by other geologists and has now been superseded by the term Laura (Cooktown) Series. (Dunstan, 1915).]

J. E. Tenison-Woods: Qld. Phil. Soc. 1880, p. 11.

NORTHBROOK BEDS (Ball, 1934).—

Tuffaceous conglomerates and marine fossiliferous shales interbedded with andesites, in the Brisbane River Valley. These were assigned to the Permo-Carboniferous and since he regarded them as part of the Fernvale Series, a late Palaeozoic age was implied for at least part of the latter.

Whitehouse (1937) stated that the suite of fossils suggests correlation with the Neerkol Beds and the Mount Barney Beds.

L. C. Ball: Q.G.M.J., 1934, p. 37.

F. W. Whitehouse: A.N.Z.A.A.S., 23, 1937, p. 430.

O

OAKEY CREEK COAL MEASURES (Reid, 1929).—

An isolated coastal occurrence in the Mackay-Styx district tentativley correlated with the Coal Measures of his Middle Bowen.

The associated volcanics and marine beds he correlated with his Lower Bowen.

J. H. Reid: Q.G.S.P., No. 276, 1929, p. 107.

O.K. SERIES (Jensen, 1923).—

Calcareous shales and schists passing into massive limestones occurring at O.K. and Tartana in the Chillagoe district. Equated with the Chillagoe Series of Silurian age.

H. I. Jensen: Q.G.S.P., No. 274, pp. 24, 27, 75.

ORALLO MEASURES (Jensen, 1926).—

That portion of the Walloon Series as developed in the Roma area which contains the Cornwall-Alcurah coals.

David (1932) placed these beds high in the Jurassic or possibly in the Cretaceous.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 69.

T. W. E David: Explanatory Notes, 1932, Table G.

OXLEY BEDS (Marks, 1910).—

Name given to a fresh-water series consisting in the main of clays and slightly coherent sandstones with an abundant dicotyledenous flora occurring about 8 miles south of Brisbane and assigned to the Tertiary.

These beds were regarded by Stokes (1892) as Tertiary. Jack and Etheridge (1892) disagreed and believed them to be part of their Ipswich Formation of Mesozoic age. Ettingshausen examined the flora and assigned the beds to the Cretaceous. Shirley (1898) on the same evidence concluded that they were Tertiary. Skertchly (1907) included the beds in his Brisbane Tertiaries. Dunstan (1916) referred to them as the OXLEY LEAF BEDS and assigned them to the Tertiary. The Oxley Beds are continuous with and have sometimes been regarded as part of the Redbank (Plains) Series which was assigned by Jones (1927) to the Eocene or Oligocene. David (1932) placed them in the Oligocene.

E. O. Marks: Q.G.S.P., No. 225, 1910, p. 49.

H. G. Stokes: Cited R. L. Jack and R. Etheridge, Geol. of Qld., 1892, p. 597.

R. L. Jack and R. Etheridge: Geol of Qld., 1892, p. 597.

C. von Ettingshausen: ''Some Fossil Plants of the Australian Cretaceous.''

J. Shirley: Q.G.S. Bull. No. 7, 1898.

S. B. J. Skertchly: Qld. Nat. I, 1907, p. 28.

B. Dunstan: Harrap's' Geography, 1916, p. 165.

O. A. Jones: P.R.S.Q., 38, 1927, p. 41.

T. W. E. David: Explanatory Notes, 1932, Table I.

P

PAGODIA STAGE (Whitehouse, 1931).—

The uppermost of his three stages within the Georgina limestones, assigned to the upper portion of the Upper Cambrian. Whitehouse (1936) retained this State but made it the uppermost of six stages within the series and correlated it with portion of the *Olenus* zone of Europe. Whitehouse (1939) replaced this name by *Rhodonaspis* Stage.

F. W. Whitehouse: Ann. Rept. Dept. Mines for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, p. 78; 11, 1939, pp. 264-5. ,

PALMERVILLE SERIES (Jensen, 1940).—

Quartzites, schists, limestones (with *Favosites* and *Halysites*) and interbedded andesites. Regarded as an extension of the Chillagoe Series and on this and the palaeontological evidence assigned to the Silurian.

H. I. Jensen: A.G. & G.S. of N.A. Rept. to Dec., 1939, 1940, pp. 19, 20.

PAPYRIASPIS STAGE (Whitehouse, 1939).—

A stage in the Georgina (Cambrian) Series, inserted between the *Phoidagnostus* Stage and the *Anomocare* Stage and correlated with portion of the *Paradoxides davidis* zone of Europe.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1939, pp. 264, 265.

PASCOE RIVER [CARBONIFEROUS] BEDS (Carey and Browne, 1938).—

The name Pascoe River Beds was used by Carey and Browne for ferruginous and micaceous sandstones and clay shales described by Morton (1924) and referred by Walkom (1924), on palaeobotanical evidence, to the Carboniferous. Whitehouse (1930) had referred them to the Lower Carboniferous. Reid (1930) had placed them tentatively in his Upper Star (Lower Carboniferous) but stated that they ''may be equivalent to some marine horizon of the Gympie Formation (Neerkol Series).'' Carey and Browne (1938) assigned them to the Lower Carboniferous.

[Not to be confused with the Pascoe River [Jurassic] Beds (David, 1932).]

C. C. Morton: Q.G.M.J., 1924, p. 81.

A. B. Walkom in C. C. Morton: Q.G.M.J., 1924, p. 81.

F. W. Whitehouse: Qld. Hbk. A.A.A.S., 1930, p. 31.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 26.

S. W. Carey and W. R. Browne: P.R.S.N.S.W., 71, 1938, p. 602.

PASCOE RIVER [JURASSIC] BEDS (David, 1932).—

An outlier of fresh water sediments with coal seams assigned to the Lower Jurassic.

Morton (1924) had considered these to be on a lower horizon than the Plutoville Beds of the same district.

[Not to be confused with the Pascoe River [Carboniferous] Beds. (Carey & Browne, 1938).]

C. C. Morton: Q.G.M.J., 1924, p. 129.

T. W. E. David: Explanatory Notes, 1932, Table G, and p. 81.

PASSAGE BEDS (of BOWEN FORMATION) (Reid, 1928).—

Alternating marine and fresh water beds forming a transition series between the Middle Bowen Marine Series and the Upper Bowen Coal Measures in the Isaacs River Basin.

J. H. Reid: Q.G.M.J., 1928, pp. 193, 238.

PEAK DOWNS (Daintree, 1872).—

One of the ten areas assigned by Daintree to his oldest or ''Metamorphic'' group of Pre-Devonian age.

These rocks lie unconformably beneath Dunstan's (1916) Peak Downs Series of Devonian age, and are thus in no sense equivalent.

R. Daintree: Q.J.G.S., 1873, p. 300.

B. Dunstan: Harrap's Geography, 1916, p. 172.

PEAK DOWNS SERIES (Dunstan, 1916).—

Coralline limestones and shales at Douglas and Drummond Creeks near Clermont, containing Devonian fossils. Regarded as equivalent to the Burdekin Series (Devonian).

This series lies unconformably above Daintree's Peak Downs metamorphic group.

See Douglas Creek Limestone and Drummond Creek Limestone.

B. Dunstan: Harrap's Geography, 1916, p. 72.

PENINSULA SERIES (Dunstan, 1915).—

Name for certain fresh-water coal-bearing strata in Cape York Peninsula, regarded as a doubtful equivalent of the Walloon Series of Jurassic age.

Dunstan (1916) greatly extended the geographical scope of the Walloon Series, with the result that, among others, the Peninsula Series was absorbed.

B. Dunstan: Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 167.

PENTLAND AND TORRENS CREEK SANDSTONE (Richards, 1919).—

A sandstone used as a building stone in Charters Towers and Townsville.

H. C. Richards: P.R.S.Q., 30, 1919, p. 136.

PERMO-CARBONIFEROUS (Etheridge, Junr., 1880).—

Synonyms are Carbo-Permian and Carbonifero-Permian.

Originally suggested as the age of certain Bowen River fossils sent by Jack to Etheridge for determination. Jack (1889) accepted Etheridge's (1880) suggestion as to the age of the Bowen River fossils, but preferred the term Carbonifero-Permian. Jack and Etheridge (1892) reverted to the term Permo-Carboniferous, but extended its scope, their ''Permo-Carboniferous System'' including at least four, and possibly five, distinct formations, namely (in ascending order): ''the Gympie, Star, and Lower, Middle, and Upper Divisions of the Bowen River Coal Field.'' While Jack and Etheridge (1892) had no doubt that the Bowen Formations were higher than the Star Formation the position of the Gympie Formation was doubtful, as the evidence was conflicting. The Gympie Formation was, with some hesitation, placed below the Star Formation, in which place it was still found in Dunstan's (1905) map. But Dunstan (1913) moved the various Gympie series above the Star Series, which, however, still remained within the Permo-Carboniferous system. David (1914) removed the Star Series to the Carboniferous, leaving the several Bowen and Gympie series in the Permo-Carboniferous. Dunstan (1916)) also assigned the Star Series to the

Carboniferous, but, abandoning the terms Bowen and Gympie as serial names, divided the Permo-Carboniferous into the following series in descending order:—Upper Coal Measures, Upper Marine Series, Lower Coal Measures and Lower Marine Series. Reid (1930) abandoned the term, placing the Upper and Middle Bowen in the Permian, the Lower Bowen in the Lower Permian to Late Upper Carboniferous and his Gympie Formation in the Upper Carboniferous. David (1931) cited Whitehouse's opinion that the dividing line between the Permian and the Carboniferous formations in Queensland should be drawn at the top of the marine strata at Mt. Britton, a conclusion based largely on the occurrence there of a cephalopod referred tentatively to *Paragastrioceras*. David (1931, 1932) "proposed to draw the line between Carboniferous and Permian in Eastern Australia at the base of the main *Eurydesma cordatum* horizon," but in an addendum stated that further evidence favours placing all the so-called Permo-Carboniferous in the Permian. Walkom (1936) argued that the term Permo-Carboniferous should be replaced by Permian. Hill (1939) regarded David's boundary as the best on the available evidence. She stated that "The Artinskian is represented in Eastern Australia but we do not as yet know its upper or lower limits."

R. Etheridge, Junr.; Proc. Roy. Phys. Soc. Edin., 1880, p. 319.

R. L. Jack: A.A.A.S., 1, 1889, p. 201.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 70.

B. Dunstan: Geol. Map of Qld., 1905; Qld. Min. Index, 1913, Pl. 0; Harrap's Geography, 1916, p. 168.

T. W. E. David: B.A.A.S., 1914, p. 258; A.N.Z.A.A.S., 20, 1931, pp. 63, 64; Explanatory Notes, 1932, p. 61.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 92.

A. B. Walkom: XVI International Geol. Congress, 1933, 1936, pp. 626-7.

D. Hill: A.N.Z.A.A.S., 24, 1939, p. 92.

PETRIE SERIES (Jones, 1927).—

Ferruginous quartzite breccias and fine-grained micaceous white and red sandstones of Tertiary age found in the neighbourhood of Petrie, about ten miles north of Brisbane.

O. A. Jones: P.R.S.Q., 38, 1927, p. 31.

PHALACROMA GROUP (Whitehouse, 1936).—

Comprises the *Phoidagnostus*, *Anomocare* and *Solenopleura* Stages in the lower part of the Georgina Series of Cambrian age.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, p. 75.

PHOENIX SLATES (Rands, 1889).—

The uppermost of four well-defined zones of slates and shales within the Gympie Series. The beds are about 200 feet thick and contain numerous marine fossils. In places these beds contain large boulders which he suggests are of glacial origin. Synonyms are PHOENIX SHALES, Monkland Slates, Monkland Shales.

Reid (1930) placed these beds near the top of his Monkland Series and a little younger than the fossil Horizon I.F.

W. H. Rands: Q.G.S.P., No. 52, 1889, pp. 4, 11.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 89 .

PHOIDAGNOSTUS STAGE (Whitehouse, 1936).—

The lowest of the six stages into which he divided the Georgina Limestones of Cambrian age It is immediately succeeded by the *Anomocare* Stage. It was correlated with the *Paradoxides davidis* zone of Europe. It forms also the lowest of the three stages of his *Phalacroma* Group.

Whitehouse (1931) had divided the series into three stages of which the *Leiagnostus* Stage was the lowest. Whitehouse (1939) placed it as the lowest but one of the series and immediately above the (new) *Agnostus seminula* Stage.

F. W. Whitehouse: Ann. Rept. Dept. Mines Qld., for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, pp. 75, 78; 11, 1939, pp. 264-5.

PHOSPHATE-BEARING SLATE BELT (Dunstan, 1904).—

Ferruginous, clayey and quartzose slates containing wavellite and turquoise, and forming the oldest portion of what Dunstan (1916) called the Gladstone-Curtis Island Series.

Richards and Bryan (1925) used the term "Phosphatic Schists" for what was presumably the same horizon in the Brisbane Schists Series as developed in the type district,

assigning them to the Ordovician. Denmead (1928) placed his Phosphate Belt at the base of his Neranleigh Series which he assigned tentatively to the Silurian.

B. Dunstan: Q.G.S.P., No. 190, 1904, p. 10.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 135.

A K. Denmead: P.R.S.Q., 39, 1928, p. 90.

PHOSPHATIC SCHISTS (Richards and Bryan, 1925).—

The lowest of their four divisions of the Brisbane Schists. Assigned to the Ordovician.

Richards and Bryan (1928) placed them in the Silurian and equated them with similar beds at Gladstone and Emu Park. Denmead (1928) included them near the top of his Bunya Series, and tentatively assigned them to the Silurian.

See "Phosphate Bearing Belt."

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 135; A.A.A.S., 18, 1928, p. 290.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103.

PINE MOUNTAIN LIMESTONE (Richards and Bryan, 1928).—

An unfossiliferous limestone in the Brisbane Valley. Assigned to the Middle Devonian and correlated on general grounds with limestones at Silverwood, Boyne River, Marmor and Cawarral.

Included in the Fernvale Series of Denmead (1928) and assigned to the Lower Devonian.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103.

PINE MOUNTAIN MANGANIFEROUS SCHISTS (Richards and Bryan, 1928).—

Assigned to the Lower Devonian and correlated with similar beds at Gladstone and Broadmount.

Afterwards incorporated in the (Lower Devonian) Fernvale Series of Denmead (1928).

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 103.

PINE MOUNTAIN RADIOLARIAN JASPERS (Richards and Bryan, 1928).—

The southerly portion of the Fernvale Jaspers.

H. C. Richards and W. H. Bryan: A.A.A.S., 18, 1928, p. 290.

PINE MOUNTAIN SERPENTINE SERIES (Dunstan, 1916).—

Massive sepentine alternating with ferruginous limestones and quartzites occurring at Pine Mountain, and at Fernvale. Correlated with his Kilkivan Serpentine Series and his Canoona-Cawarral Serpentine Series. Tentatively assigned to the Devonian.

Richards and Bryan (1925) differentiated the Sepentine which they regarded as Upper Devonian from the associated jaspers which they placed in the Lower Devonian. Bryan (1926) assigned this and some other serpentines of Queensland tentatively to the Carboniferous. Denmead (1928) followed Bryan.

See Serpentine Belt.

B. Dunstan: Harrap's Geography, 1916, p. 173.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 135.

W. H. Bryan: P.R.S.Q., 37, 1926, p. 67.

A K. Denmead: P.R.S.Q., 39, 1928, p. 102.

PITURI SERIES (Whitehouse, 1936).—

Marine sandstones and shales of a minimum thickness of 100 feet in the Glenormiston area assigned to the Croixian division of the Cambrian. Included near the base is the *Elathriella* Stage. The series is younger than the Georgina limestones which it overlies conformably but older than the Ninmaroo limestones.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, pp. 68, 78.

PLUMBAGO, LOWER (Dunstan, 1912).—

Term for a graphitic shale, being an horizon in his Conglomerate Group of the Middle Gympie Formation.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

PLUMBAGO, UPPER (Dunstan, 1912).—

A graphitic shale horizon in his Conglomerate Group of the Middle Gympie Formation.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

PLUTOVILLE BEDS (Morton, 1924).—

Morton, although he did not formally propose this serial name, described freshwater beds on the Pascoe river which he regarded on field evidence as occupying a higher horizon than the Pascoe River [Jurassic] Beds.

Walkom (1928) placed them in the Lower Cretaceous on palaeo-botanical evidence. David (1932) assigned them to the Aptian.

C. C. Morton: Q.G.M.J., 1924, p. 129.

W. H. Bryan and F. W. Whitehouse: P.R.S.Q., 38, 1927, p. 111.

A. B. Walkom: Proc. Linn. Soc. N.S.W., 1928, p. 146.

T. W. E. David: Explanatory Notes, 1932, Table H.

PORT CLINTON COAL SERIES.—

Synonym for Waterpark Coal Series.

POST-TERTIARY IRONSTONE (Rattray, 1869).—

A self-explanatory term for a series found at Cape York, Albany Island, Somerset, and as far south as the Mitchell River, and probably west to the Gulf of Carpentaria.

[Probably equivalent to one of Whitehouse's Laterites (Tertiary).]

A. Rattray: Q.J.G.S., 1869, p. 301.

PROCERATOPYGE GROUP (Whitehouse, 1936).—

Comprises the *Anorina, Glyptagnostus* and *Pagodia* Stages in the upper part of the Georgina (Cambrian) Series.

[Not to be confused with his less comprehensive *Proceratopyge* Stage.]

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, p. 76.

PROCERATOPYGE STAGE (Whitehouse, 1931).—

A stage within the Georgina Limestones, lying below the *Pagodia* Stage and above the *Leiagnostus* Stage and assigned to the lower portion of the Upper Cambrian. Later (Whitehouse, 1936) this term was dropped in a more detailed rearrangement.

[Not to be confused with his *Proceratopyge* Group which embraces also other stages.]

F. W. Whitehouse: Ann. Rept. Dept. Mines, Qld., for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, p. 78.

PRODUCTUS BRACHYTHAERUS BEDS (Reid, 1930).—

Beds within the Middle Bowen Series exposed on both sides of he Serocold anticline in the Springsure district.

[Probably synonymous with Hill's Mantuan *Productus* Beds.]

J. H. Reid: Q.G.M.J., 1930, p. 150.

PROTOCANITES BEDS (Whitehouse, 1930).—

The basal beds of the Rockhampton Series in the type area, tentatively correlated with the Star Series.

Whitehouse (1930) also referred to these as the Rockhampton Goniatite Bed, and regarded it as the equivalent of the *Protocanites lyoni* zone, the basal zone of the European Carboniferous sequence. Hill (1943) placed it in the Tournaisian but above a newly recognised horizon, the *Michelinia* Limestone of lower Lion Creek.

F. W. Whitehouse: Qld. Hbk., A.A.A.S., 1930, pp. 30, 31.

D. Hill: P.R.S.Q., 54, 1943, Table opp. p. 64.

PROTORETEPORA HORIZON (Reid, 1930).—

An horizon in the upper part of his Neerkol Series; sometimes referred to as Bryozoan beds.

J. H. Reid: Q.G.S.P., No. 278, 1930, opp. p. 76.

PUSTULA HORIZON (Reid, 1930).—

An horizon containing *Pustula* and sometimes also *Protoretepora* immediately above the *Amygdalophyllum* limestone of Lion Creek.

This bed was regarded by Reid and Morton (1928) as lying disconformably above the Lion Creek Limestone and as forming the lowermost bed of their Stanwell Marine (Neerkol) Series. Whitehouse (1928) saw no reason for this disconformity and regarded the horizon as within the Rockhampton Series. Reid (1930) restated the case for a disconformity and placed the horizon in his Neerkol Series.

Richards, Bryan and Whitehouse (1933) correlated the Mt. Barney Beds with this horizon.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 386.

F. W. Whitehouse: Q.G.M.J., 1928, p. 441.

J. H. Reid: Q.G.S.P. No. 278, 1930, pp. 34, 38, 53.

H. C. Richards, W. H. Bryan and F. W. Whitehouse: P.R.S.Q., 44, 1933, p. 68.

Q

QUAMBY CONGLOMERATES (Ball, 1921).—

Conglomerates derived from the Cloncurry Series. Not assigned to any definite age. See Mount Quamby Series (Honman, 1936).

L. C. Ball: Q.G.M.J., 1921, p. 10.

R

RADIOLARIAN JASPERS (Richards and Bryan, 1925).—

One of their divisions of the Brisbane Schists assigned to the Lower Devonian. First record of fossils in the Brisbane Schists.

Denmead (1928) included this horizon in his Fernvale Series (*q.v.*), which he placed in the Lower Devonian.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 135.

A. K. Denmead: P.R.S.Q., 39, 1928, p. 91.

RAISED BEACHES (Jack and Etheridge, 1892).—

Listed as a Post-Pliocene "Formation."

Dunstan (1916) placed these as the oldest of the Quaternary "Series" in his classification.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

B. Dunstan: Harrap's Geography, 1916, p. 164.

RANNES, EMU PARK AND ANAKIE SERIES (Reid and Morton, 1928).—

A metamorphic series, placed as Lower Palaeozoic and shown as unconformably underlying fossiliferous Devonian strata.

Whitehouse (1928) argued that the relationship of this series to the overlying rocks is a conformable one.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 388.

F. W. Whitehouse: Q.G.M.J., 1928, p. 441.

RAVENSWOOD (Daintree, 1872).—

One of the ten areas assigned to his oldest or "Metamorphic" group of Pre-Devonian age.

R. Daintree: Q.J.G.S., 1872, p. 300.

RECENT ALLUVIA (Jack and Etheridge, 1892).—

Listed as a Post-Pliocene "Formation."

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

RECEPTACULITES HORIZON (Whitehouse, 1929).—

An horizon in the Mt. Wyatt district of which Whitehouse (1929) wrote "The horizon of this form urgently needs investigation. I am by no means convinced that the Carboniferous age assigned to previous specimens from this area on the evidence of associated fossils, is correct. The possibility of the fauna belonging to the shelly facies of the Devonian

must be considered particularly since beds of this facies are now known at Mt. Wyatt and Ukalunda.''

F. W. Whitehouse: Q.G.M.J., 1929, p. 159.

REDBANK PLAINS SERIES (Jones, 1927).—

A comprehensive term to cover the Oxley Beds of Marks (1910), the Redbank Series of Dunstan (1913) and fresh water Tertiary shales and limestones lying conformably below the Silkstone Series of Cameron (1923). Assigned to the Eocene or Oligocene.

Hills (1934) from a study of the fresh water fish, concluded that the age is Eocene or Oligocene, probably Oligocene. Chapman (1935) stated that the contained ostracods indicate deposition in ''a lacustrine area open intermittently to a shallow sea.'' As to age, he concluded that the rocks may range ''from Lower Miocene, or even older, to Pliocene.''

O. A. Jones: P.R.S.Q., 38, 1927, p. 41.

E. S. Hills: Mem. Qld. Mus., 10, pt. iv, 1934, p. 171.

F. Chapman: P.R.S.Q., 46, 1935, p. 70.

REDBANK SERIES (Dunstan, 1913).—

A series of fossiliferous fresh-water sediments of Tertiary age lying to the south of Goodna.

This series is sometimes included in the term Brisbane Tertiaries. Jones (1927) used the term Redbank Plains Series in a somewhat more comprehensive sense including therein the Oxley Beds, and assigning the whole series to the ''Eocene or Oligocene.''

B. Dunstan: Qld. Min. Index, 1913, Pl. 25.

O. A. Jones: P.R.S.Q., 38, 1927, p. 41.

REDCLIFFE SERIES (Reid, 1925).—

A series of massive sandstones overlying the Permo-Carboniferous rocks of the Bowen River Coalfield. Assigned tentatively to the ''Trias.''

Reid (1928) correlated this with his Cardborough Series. Reid referred to the series as REDCLIFFE TABLELAND SANDSTONE (1924) and REDCLIFFE PLATEAU SANDSTONE (1929).

J. H. Reid: Q.G.M.J., 1925, p. 10; 1928, p. 236; Q.G.S.P., No. 276, 1929, p. 105.

RED EARTH RESIDUALS (Bryan, 1939).—

Fossil soils, being dissected remnants of an old erosion surface, regarded ''almost as a stratigraphic unit—a datum to which earlier and later events might be referred,'' and assigned tentatively to the Pliocene.

W. H. Bryan: P.R.S.Q., 50, 1939, pp. 22, 28.

REDLICHIA STAGE (Whitehouse, 1930).—

The lower of the two stages of the Templeton Series ''representing an horizon about the junction of the Lower and Middle Cambrian.''

It is the lowest stage recognised in the Cambrian of Queensland. Whitehouse (1931) regarded this as the lower of his two Cambrian Stages in the Templeton Series and assigned it to the upper portion of the Lower Cambrian. Whitehouse (1936) regarded it as the lowest of *four* stages in the series and immediately below the *Amphoton* Stage.

Grabau (1937) suggested the possibility of a disconformity immediately above the *Redlichia* Stage. Resser (1939) stated that the *Redlichia* fauna of Australia appears to be equivalent to the *Olenellus* zone of the Cordilleran region of North America.

F. W. Whitehouse: Ann. Rept. Dept. Mines Qld. for 1930, 1931, p. 141; Qld. Hbk. A.A.A.S., 1930, p. 27; Mem. Qld. Mus., 11, 1936, p. 78; 11, 1939, pp. 264-5.

A. W. Grabau: Palaeozoic Formations in the Light of the Pulsation Theory, 3, pt. 2, 1937, pp. 372-3.

C. E. Resser: Proc. Sixth Pacific Sci. Congress, 1939, p. 366.

REID (GAP) BEDS (Jack, 1884).—

Limestones near Reid Gap, Townsville district, conformably underlying sandstones with *Dicranophyllum australicum* and containing corals believed comparable with those of the Burdekin Formation.

Hill (1942, 1943), on the evidence of the rugose corals, assigned the limestones to the middle section of the Givetian, and correlated them with the limestones of Burdekin Downs and the Fanning River.

R. L. Jack: Q.G.S.P., No. 116, 1884, p. 5, and diagram No. 1.

D. Hill: P.R.S.Q., 53, 1942, p. 229; 54, 1943, p. 61 and Table.

RHAETOSAURUS HORIZON (David, 1932).—

The horizon of the giant dinosaur *Rhaetosaurus brownei* at Durham Downs within the Lower Walloon Series.

H. A. Longman: Mem. Qld. Mus., 8, pt. 3, 1926, p. 183; 9, pt. 1, 1927, p. 1.

T. W. E. David: Explanatory Notes, 1932, p. 82 and Table G.

RHODONASPIS STAGE (Whitehouse, 1939).—

New name for the *Pagodia* Stage of the Georgina (Cambrian) Series. It is the uppermost stage of the series and lies immediately above the *Glyptagnostus* Stage and stratigraphically immediately below the *Elathriella* Stage of the Pituri Series. It is correlated with portion of the *Olenus* zone of Europe.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1939, pp. 264-5.

RHYOLITE RANGE BEDS (Richards and Bryan, 1925).—

A series consisting for the most part of acid flows and associated tuffs overlying shallow water sediments containing large *Palaeopectens* and other marine fossils, forming a division of their Fault Block Series of Permo-Carboniferous age in the Silverwood-Lucky Valley area. They are correlated with the upper part of the Condamine Beds and with part of the Eight Mile Creek Beds.

Reid (1930) correlated the upper part (volcanics) with his Lower Bowen Series and regarded the whole as younger than the Condamine Beds. Voisey (1935) agreed with Reid on these points, but (1936, 1939) stated that the Fault Block Series as a whole is "to be considered Lower Permian in age."

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 65.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 68.

A. H. Voisey: P.R.S.Q., 46, 1935, p. 60 *et seq.* (but see also p. xiv); Proc. Linn. Soc. N.S.W., 1936, p. 163; 1939, p. 389.

RIVERLEIGH LIMESTONE (Hill, 1934).—

A reef limestone, rich in rugose corals, which "can be correlated with a fair degree of precision with the D_2 [Visean] fauna of England." It is closely similar in lithology and fossil content, to the Lion Creek Limestone, which, however, may be on a slightly lower horizon.

Hill (1943) correlated it with the limestones of Lion Creek and Cania and with the Cannindah [Lower] Limestone, assigning it to the Upper Visean or possibly Moscovian.

D. Hill: P.R.S.Q., 45, 1934, p. 105; 54, 1943. p. 63 and Table.

ROCKHAMPTON GONIATITE BED (Whitehouse, 1930).—

Synonym for *Protocanites* Beds.

F. W. Whitehouse: Qld. Hdk. A.A.A.S., 1930, p. 30.

ROCKHAMPTON GRITS (Whitehouse, 1927).—

Beds low in the Rockhampton Series, which contain *Protocanites*, and extend downwards at least to the base of the Carboniferous and possibly into the top of the Devonian. See *Protocanites* Beds (Whitehouse, 1930).

F. W. Whitehouse: Q.G.M.J., 1927, p. 189.

ROCKHAMPTON SERIES (Daintree, 1870).—

A series of slates and limestones in central Queensland, assigned to the Lower Devonian.

Jack and Etheridge (1892) included the series within their "Gympie Formation" of Permo-Carboniferous age. (See Gympie Series.) Dunstan (1916) referred to "many carboniferous fossils within the series" and regarded it as equivalent to the Star Series of Carboniferous age. Whitehouse (1927) assigned the Lion Creek limestone of this series to the D_2 zone of the Visean. Reid and Morton (1928) regarded the Lion Creek limestone as the uppermost bed of the series, but Whitehouse (1928) held that the natural upper limit "is the marine stage immediately below the Dinner Creek Series." (See Stanwell Disconformity.) With regard to the lower limit Whitehouse (1930) stated that the basal zone of the European Carboniferous sequence (zone of *Protocantis lyoni*) is present in the Rockhampton Goniatite Bed. Reid (1930) reaffirmed the views as set out by Reid and Morton (1928). David (1932) agreed with Whitehouse (1928, 1930) as to the lower and

upper limits of the series, placing the lowest beds in the Tournaisian and the upper beds in the Visean with the Lion Creek Limestone assigned to the D_2 or D_3 zone. Hill (1934) after a detailed examination of the contained rugose corals supported Whitehouse's conclusions as to the stratigraphical range of the series, but (1943) recognised an additional bed (the *Michelinia* limestone) at the base and referred to the possibility of the Lion Creek Horizon being Moscovian.

R. Daintree: General Rept. on the Northern District, Qld. Parl. Papers, 1870.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 90.

B. Dunstan: Harrap's Geography, 1916, p. 171.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 386.

F. W. Whitehouse: P.R.S.Q., 39, 1928, p. x; Q.G.M.J., 1928, p. 441; Qld. Hbk. A.A.A.S., 1930, p. 30.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 28-31.

T. W. E. David: Explanatory Notes, 1932, pp. 58, 59.

D. Hill: P.R.S.Q., 45, 1934, p. 103; 54, 1943, p. 63.

ROLLING DOWNS-BURRUM SERIES (Dunstan, 1913).—

The correlation on which this composite term was based by Dunstan (1913) was abandoned by him in 1916. See Rolling Downs Formation and Burrum Series.

B. Dunstan: Qld. Min. Index, 1913, Pl. 0.

ROLLING DOWNS FORMATION (Jack, 1886).—

A very extensive formation consisting of sandstones, shales, concretionary limestones, and calcareous sandstones, for the most part of marine origin, covering three-fourth of Queensland, and extending from the Palaeozoic ranges on the east coast to the western and southern boundaries of the State. Assigned to the Lower Cretaceous. So-called from the characteristic landscape produced from the formation.

Clarke (1862) forwarded from Wallumbilla a set of fossils, which he considered Rhaetic (and which McCoy thought were not younger than the base of the Great Oolite, and not older than the base of the Trias), to Moore (1869), who stated that "The Lias, the Great Oolite, the Oxford Clay, the Portland Oolite, and the Cretaceous Beds may each put in a claim, but that of the Oxford Clay appears to be strongest. That they all belong to the Upper Oolite may with safety be inferred." At the same time Moore referred fossils from Amby in the same neighbourhood to the Neocomian. Daintree (1872) referred the formation in question in part to the Oolitic, and in part to the Cretaceous. Etheridge, Senr. (1872) differentiated them into (1) Gordon Downs Beds (Oolitic), (2) Wallumbilla Beds (Lias and Oolite), (3) Hughenden Beds (Cretaceous), and (4) Marathon Beds (Cretaceous). Jack (1886) argued that the fossils from his Rolling Downs Formation must be treated as a whole since it formed a continuous series of enormous thickness, in which, however, from the scarcity of sections, it would be impossible to map out horizons. He assigned the whole to the Lower Cretaceous, and this Etheridge, Junr. (1892) followed. Dunstan (1913) used the term Rolling Downs-Burrum Series, regarding it as Lower Cretaceous. (The Burrum beds, which had previously been regarded as older, were subsequently shown to be younger than the Rolling Downs Formation.) Dunstan (1916) used the name Rolling Downs Marine Series to cover not only Jack's (1886) formation, but also the Blythesdale Braystone and much of the Desert Sandstone. He regarded the series as equivalent to the Maryborough Marine Series and referred both to the Lower Cretaceous. Whitehouse (1927) re-examined the whole question, and divided the Rolling Downs Formation into two main series and an underlying bed as follows: (1) Tambo Series (Albian), (2) Roma Series (Aptian), (3) Morven Bed (Hauterivian). The Roma Series he correlated with the Maryborough Beds. In his later work Whitehouse no longer recognised his Morven Bed.

For later information see Roma Series, Tambo Series.

R. L. Jack. Hbk. Qld. Geol., 1886, p. 65.

W. B. Clarke: Q.J.G.S., 1862, p. 245.

C. Moore: Q.J.G.S., 1870, p. 239.

R. Daintree: Q.J.G.S., 1872, p. 282.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 434.

B. Dunstan: Qld. Min. Index, 1913, Pl. 0; Harrap's Geography, 1916, p. 166.

F. W. Whitehouse: P.R.S.Q., 38, 1927, p. 111.

ROLLING DOWNS MARINE SERIES (Dunstan, 1916).—

This term covered the Blythesdale Braystone and much of the Desert Sandstone in addition to the Rolling Downs Formation of Jack (1886), all of which was placed in the Lower Cretaceous.

B. Dunstan: Harrap's Geography, 1916, p. 166.

ROMA SERIES (Whitehouse, 1926).—

The lower of the two main series into which he divided Jack's (1886) Rolling Downs Formation. The Roma Series was assigned to the Aptian and regarded as equivalent to the Maryborough Beds of the coast.

Whitehouse (1927) divided it into the Ancyloceratan, Australiceratan, Tropaeuman and Ammonitoceratan stages in ascending order. Whitehouse (1930) suggested the possibility of an additional, Coilotan (?) Stage at the base. He also emphasised the stratigraphical discontinuity between the Roma Series and the overlying Tambo Series. David (1932) also assigned the series to the Aptian but definitely added the "*Coilotis* Stage" at the base, making five stages in all.

F. W. Whitehouse: Mem. Qld. Mus., 1926, p. 196; Q.G.M.J., 1927, p. 145; A.A.A.S., 18, 1928, p. 277; Qld. Hbk. A.A.A.S., 1930, p. 37.

T. W. E. David: Explanatory Notes, 1932, Table H.

ROSEWOOD STAGE (Reid, 1922).—

Mainly soft, very felspathic sandstones with clay shales, but characterised by beds of fossiliferous red sandstone, ironstone concretions, numerous beds of calcareous shales and sandstones and numerous coal seams. Assigned to the Jurassic.

Reid (1927) referred to the shales and sandstones at the base of the ROSEWOOD COAL MEASURES in the Lanefield area as the Lower Sandstone Series. David (1932) used the term ROSEWOOD-WALLOON SERIES as synonymous with Rosewood Stage.

[The "Rosewood Stage" is in fact the "Walloon Coal Measures" as developed in the type area.]

J. H. Reid: Q.G.S.P., No. 272, 1922, p. 10; Q.G.M.J., 1927, pp. 6, 8.

T. W. E. David: Explanatory Notes, 1932, Table G.

S

SAND DUNES (Jack and Etheridge, 1892).—

Accumulations of wind blown sand, often attaining a considerable elevation, found fringing the coast at intervals. Assigned "To the most recent phase of the Post-Tertiary, and extending to the present day."

David (1932) extended the term to cover also the Desert Sand Dunes and placed all as Recent or possibly high in the Pleistocene. Whitehouse (1940) divided both Coastal and Desert Dunes into older, consisting of "dead" or "fossil" dunes assigned to the late Pleistocene, and younger "live" Dunes, still in the process of formation.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, pp. 3, 621.

T. W. E. David: Explanatory Notes, 1932, p. 26, and Table I.

F. W. Whitehouse: Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, pp. 68-71.

SANDY CREEK (COAL) MEASURES (Reid, 1930).—

A small section of coal measures and some marine beds with thin bands of coal, in Sandy Creek, six miles north-west of Rewan. They overlie the Serocold sandstones. Regarded by Reid as probably the base of the Middle Bowen.

J. H. Reid: Q.G.M.J., 1930, p. 93.

SCHIZOPHORIA-LEPTOSTROPHIA HORIZON (Whitehouse, 1929).—

An important horizon within the Ukalunda Series.

F. W. Whitehouse: Q.G.M.J., 1929, p. 158.

SECOND BED OF SLATE (Rands, 1889).—

An important horizon within the Gympie Series consisting of 13 feet of black shales. Included by Dunstan (1912) in his *Third* Slate Group.

W. H. Rands: Q.G.S.P., No. 52, 1889, p. 3.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

SECOND SLATE GROUP (Dunstan, 1912).—

The middle slate group of his Middle Gympie Formation

Approximately equivalent to Rands' (1889) *First* Bed of Slate.

W. H. Rands: Q.G.S.P., No. 52, 1889, p. 3.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

SECOND VOLCANIC (GREENSTONE) GROUP (Dunstan, 1912).—

The middle volcanic group of his Middle Gympie Formation.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

SEROCOLD SANDSTONE (Reid, 1930).—

The uppermost stage of the Lower Bowen Series as developed in the Springsure district.

J. H. Reid: Q.G.M.J., 1930, p. 93; P.R.S.Q., 42, 1931, p. 57.

SERPENTINE BELT (Dunstan, 1904).—

The middle of the three belts into which he divided the Palaeozoic rocks of the Keppel Bay area, the other belts being the (older) Phosphate-bearing Slate Belt and the (younger) Limestone Slate Belt.

Dunstan afterwards extended this and the associated belts to the south as horizons in his "Amamoor Series" and "Brisbane Schist Series."

[This use of the "Serpentine Belt" as a stratigraphical horizon is a dangerous one inasmuch as the serpentine definitely postdated the other belts into which it is intruded as a sill. Further the stratigraphical position of such a sill may not be constant.]

B. Dunstan: Q.G.S.P., No. 190, 1904, p. 10.

SHERWOOD SKERRY SCREE (Skertchly, 1908).—

The second lowest horizon in Skertchly's Brisbane Tertiaries. Scree supposed to have been caused by frost action in Tertiary times.

S. B. J. Skertchly: Qld. Naturalist, 1908, p. 51.

SILKSTONE SERIES (Cameron, 1923).—

Tertiary shales, limestones, etc., occurring at Silkstone and East Ipswich resting conformably on the Redbank Plains series.

Jones (1927) regarded this as the upper of the two Tertiary Series in the Brisbane-Ipswich area, and assigned it to Upper Tertiary. Bryan (1939) assigned it doubtfully to the Oligocene. Whitehouse (1940) described the limestones as his Earlier Siliceous Limestones [see Limestones (Tertiary)] and placed them provisionally as Miocene. Singleton (1941) referred the series provisionally to the Oligocene.

W. E. Cameron: Q.G.S.P., No. 271, 1923.

O. A. Jones: P.R.S.Q., 38, 1927, p. 41.

W. H. Bryan: P.R.S.Q., 50, 1939, p. 28.

F. W. Whitehouse: Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 34.

F. A. Singleton: P.R.S. Vict., 53 (n.s.), 1941, p. 50.

SILVERSPUR BEDS (Stokes, 1899).—

A series of marine sediments containing Permo-Carboniferous fossils.

Reid (1930) correlated these with his Gympie (Transitional) Series.

H. G. Stokes: Proc. North of England Inst. of Min. and Mech. Engineers, 1899; quoted in L. C. Ball: Q.G.S.P., No. 191, 1904, p. 27.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 60.

SILVER VALLEY BEDS.—

Name in common use for beds near Newellton, originally described by Stirling (1905). These consist of gently dipping sediments with *Rhacopteris* (*Aneimites*), resting unconformably upon the highly folded and somewhat metamorphosed metalliferous rocks.

Dunstan (1916) included the Beds in his Herberton Series (containing (*Lepidodendron*) which he assigned tentatively to the Carboniferous. Jensen (1923) followed Stirling and emphasised the stratigraphical significance of the unconformity beneath the "*Rhacopteris* beds." Reid (1930) wrote "The Silver Valley Beds with *Aneimites ovata*, though a very thin section, ... may correspond to some lower portion of the suggested Gympie

[Transitional] rather than the Upper Star Series.'' David (1932) placed the Beds in the lowest part of the Upper Carboniferous. Reid (1933) described the volcanic rocks on the eastern side of the Dry River as an extension of these beds; within the volcanics he recorded in ascending order, and in apparently conformable sequence, boulder conglomerates about 250 feet, *Rhacopteris* shales 80-100 feet and varve shales 6 feet. Carey and Browne (1938) correlated these with the Neerkol Series, assigning them to the Middle Carboniferous.

J. Stirling: Monograph on the Geology and Mining Features of Silver Valley. J. C. Konig and Ebhardt, Hanover, 1905.

B. Dunstan: Harrap's Geography, 1916, p. 117.

H. I. Jensen: Q.G.S.P., No. 274, 1923, p. 19.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 26; Q.G.M.J., 1932, p. 289; A.N.Z.A.A.S., 21, 1933, p. 465.

T. W. E. David: Explanatory Notes, 1932, Table D.

S. W. Carey and W. R. Browne: P.R.S.N.S.W., 71, 1938, p. 602.

SILVERWOOD LIMESTONE (Richards and Bryan, 1925).—

Fossiliferous coralline limestone of Middle Devonian age within the Silverwood Series.

Richards and Bryan (1928) correlated it with other limestones at Pine Mountain, Boyne River, Marmor and Cawarral. David (1932) placed it tentatively in the Givetian, Hill (1940) on the evidence of the contained rugose corals assigned it to the Couvinian. Hill (1943) on indirect palaeontological evidence stated that the age may be as old as Lower Devonian.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 98; A.A.A.S., 18, 1928, p. 290.

T. W. E. David: Explanatory Notes, 1932, Table C.

D. Hill: P.R.S.Q., 51, 1940, p. 150; 54, 1943, p. 59 and Table.

SILVERWOOD SERIES (Richards and Bryan, 1925).—

A series of andesitic tuffs, banded radiolarian cherts and fossiliferous coralline limestones in the Silverwood-Lucky Valley area in Southern Queensland assigned to the Devonian.

David (1932) placed the Series in the Middle Devonian (Givetian). Hill (1940) on the evidence of the contained rugose croals assigned the limestone to the Couvinian, but (1943) thought it might be as old as Lower Devonian.

[Within the district occupied by the series are small areas of richly fossiliferous Permo-Carboniferous beds, and on these fossils earlier workers based the age of the whole district, assigning it variously to the ''Silurian,'' ''Devonian,'' and ''Permo-Carboniferous,'' as the several geological maps of Queensland show.]

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 55.

T. W. E. David: Explanatory Notes, 1932, Table p. 48.

D. Hill: P.R.S.Q., 51, 1940, p. 150; 54, 1943, p. 59 and Table.

SLATES, SCHISTS, ETC., OF UNDETERMINED AGE.—

The lowest ''Formation'' listed by Jack and Etheridge (1892) and referred by them to Silurian ?, Cambrian ?, Laurentian ?.

[Many of the series there included are still of unknown age.]

R. L. Jack and Etheridge: Geol. of Qld., 1892, p. 3.

SOLDIER'S CAP SERIES (Honman, 1936).—

Metamorphic schists, greenstones, slates and quartzites in the Cloncurry region, regarded as of Newer Archaeozoic age and separated by unconformities from the Kalkadoon Argylla Series below and the Mt. Isa Series above.

Honman (1937) stated that ''the Mount Isa Series and the Soldier's Cap Series represent the same or closely adjoining horizons in the pre-Cambrian systems. The essential lithological difference is due to the degree of metamorphism rather than to difference in age.'' But later in the same report the Soldier's Cap Series was shown to lying with apparent conformity below the Mount Isa Series.

C. S. Honman: A.G. & G.S. of N.A., Rept., Dec. 1935, 1936, p. 49; Rept. Qld. No. 1, 1936, p. 3; Rept. Qld. No. 19, 1937, p. 5; Rept., Dec. 1936, 1937, pp. 60, 65, Pl. 4.

SOLENOPLEURA STAGE (Whitehouse, 1936).—

One of the six stages into which he divided the Georgina Limestones. It lies immediately above the *Anomocare* Stage and below the *Anorina* Stage, and was correlated with the *Lejopyge laevigatus* zone of the Middle Cambrian of Europe. It forms also the uppermost of the three stages of his *Phalacroma* Group.

Whitehouse (1931) had previously divided the series into three stages, of which this was not one. Whitehouse (1939) deleted this stage.

F. W. Whitehouse: Ann. Rept. Dept. Mines Qld. for 1930, 1931, p. 141; Mem. Qld. Mus., 11, 1936, p. 78; 11, 1939, pp. 264-5.

" SPIRIFER DISJUNCTUS " HORIZON (Whitehouse, 1929).—

An important stratigraphical horizon within the lower part of the Mount Wyatt Series.

F. W. Whitehouse: Q.G.M.J., 1929, p. 158.

STAIRCASE SANDSTONE (Reid, 1930).—

The lowest stage in the Lower Bowen Series as developed in the Springsure district.

J. H. Reid: Q.G.M.J., 1930, p. 98.

STANWELL COAL MEASURES (Dunstan, 1898).—

A series of fresh-water sediments regarded as equivalent to the Ipswich Series and assigned to Upper Trias-Jura.

Dunstan (1915) preferred the term STANWELL SERIES, regarded it as the doubtful equivalent of the Walloon Series, and therefore referred it to the Jurassic. Dunstan (1916) confirmed this. Reid and Morton (1928) placed the measures above the Carborough Sandstones and below the Walloon Series. Whitehouse (1928) on palaeontological evidence equated them with the lower part of the Walloon Series. David (1932) regarded them as an outlier of the Walloon Coal Measures and placed them in the Upper Jurassic.

B. Dunstan: Q.G.S.P., No. 131, 1898, p. 14; Q.G.S.P., No. 252, 1915; Harrap's Geography, 1916, p. 167.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 388.

F. W. Whitehouse: Q.G.M.J., 1928, p. 442

T. W. E. David: Explanatory Notes, 1932, Table G and p. 81.

STANWELL DISCONFORMITY (Reid and Morton, 1928).—

"A strong case for a disconformity between the Lion Creek Limestone and the Stanwell Marine Series can be made."

Whitehouse (1928) disagreed with the existence of such a disconformity. Reid (1930) reaffirmed the views of Reid and Morton (1928) and further he considered that 1,725 feet of strata in the Cannindah area, including the Cannindah [Upper] Limestone, were deposited in the interval represented by this non-sequence. Hill (1934) regarded the correlation of these beds with the "postulated non-sequence" as not proven.

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, p. 386.

F. W. Whitehouse: Q.G.M.J., 1928, p. 441.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 34.

D. Hill: P.R.S.Q., 45, 1934, p. 106.

STANWELL MARINE SERIES (Reid and Morton, 1928).—

A series with an estimated thickness of 4,500 feet of mudstones and grits, considered as Upper or Middle Carboniferous. It lies conformably below the Dinner Creek Series and disconformably above the Lion Creek Limestone. [But see "Stanwell Disconformity."]

Whitehouse (1928) in referring to the contained fossils wrote "It is a new subfauna in our Carboniferous sequence and indicates the horizon to be in the lowest part of the Upper Carboniferous or the top of the Lower Carboniferous." Reid (1930) recommended that this serial name be replaced by the name Neerkol Series, q.v.

[Not to be confused with Dunstan's (1915) Stanwell Series. See Stanwell Coal Measures.]

J. H. Reid and C. C. Morton: Q.G.M.J., 1928, pp. 385, 388.

F. W. Whitehouse: Q.G.M.J., 1928, p. 441.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 11.

STANWELL SANDSTONE (Richards, 1919).—

A sandstone of Lower Mesozoic age within the Stanwell Coal Measures, used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 135.

STAR SERIES (Jack, 1879).—

Synonyms are STAR BEDS and STAR FORMATION. Jack described as Star Beds a series of sediments in the basin of the Star River containing both marine and plant fossils. Assigned by him to his Upper Division of the Devonian.

Etheridge, Senr. (1872) had placed this Series in the Devonian above the Gympie Series. Jack (1879) divided the Devonian of the Charters Towers district into three divisions which were in ascending order: (1) Burdekin Downs, (2) Dalrymple and Dotswood, and (3) Start District. Jack (1886) in his stratigraphical table for all Queensland inserted the Gympie Beds between the Dotswood Beds and the Star Beds, and placed the Bowen River Beds above the Star Beds. Jack (1889) included under the term Star Formation both the Star Beds and the Dotswood Beds, and placed them in the Carboniferous. Etheridge, Junr. (1891) stated that *Lepidodendron australe* occurs in the Star Beds associated with a Carboniferous fauna. Jack and Etheridge (1892) treated the formation as of "Permo-Carboniferous age," and placed it below the Lower Bowen Formation and (with some hesitation) above the Gympie Formation. Dunstan (1913) regarded the Star Series as Permo-Carboniferous but placed it below the Gympie Series. David (1914) assigned the series to the Carboniferous. Dunstan (1916) regarded the series as equivalent to the Drummond Series and Rockhampton Series, all being placed in the Carboniferous. Whitehouse (1930) tentatively correlated the Star Series with the basal (*Protocanites*) beds of the Rockhampton Series. Reid (1930) considered that the "upper division" is a fresh-water representative of the Rockhampton Series, while the "lower [marine] division" is of Upper Devonian age. He further suggested that all known marine beds of the Star Formation are at least as old and "may range down to the 'Middle Devonian.'" David (1932) assigned the Lower Star Beds to the upper part of the Middle Devonian and the Upper Star Beds as transitional between Devonian and Carboniferous.

R. L. Jack: Q.G.S.P., 1, 1879, Map No. 2; Hbk. Qld. Geol., 1886, A.A.A.S., 1, 1889, p. 5.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

R. Etheridge, Junr.: Rec. Geol. Surv. N.S.W., 1891, p. 133.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 3.

B. Dunstan: Qld. Min. Index, 1913, Pl. 0; Harrap's Geography, 1916, p. 170.

T. W. E. David: B.A.A.S., 1914, p. 258; Explanatory Notes, 1932, p. 28.

F. W. Whitehouse: Qld. Hbk. A.A.A.S., 1930, p. 31.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 10.

STEWART'S CREEK AND ROSEWOOD BEDS (Jack, 1889).—

A series of fresh-water fossiliferous sediments in the Rockhampton district containing Mesozoic plants.

Jack (1889) regarded these beds as younger than the "Burrum Formation" (which was then thought to be older than the Ipswich Formation). Jack and Etheridge (1892) included them in their Ipswich Coal Measures and assigned them to the Upper Trias-Jura. Walkom (1918) referred them to the Walloon Series.

[This "Stewart's Creek" should not be confused with Stewart's [Stuart's] Creek, near Townsville, which is a locality for Permo-Carboniferous fossils, nor should this "Rosewood" be confused with the Rosewood near Ipswich, the type area of the Rosewood (Walloon) Coal Measures of Jurassic age.]

R. L. Jack: A.A.A.S., 1, 1889, p. 203.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 313.

A. B. Walkom: Proc. Linn. Soc. N.S.W., 1918, p. 56.

STROPHALOSIA GLACIAL BEDS (Reid, 1930).—

Also referred to as STROPHALOSIA STAGE. See Big *Strophalosia* Horizon.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 63, 90.

STYX SERIES (Jack, 1886).—

A series of fossiliferous fresh-water sediments with coal seams in the valley of the Styx at the southern end of Broad Sound. Assigned by Jack to the "Carbonifero-Permian."

Jack (1886) placed, between the Star Beds and Ipswich Beds, a formation composed of the "Bowen River and other Coal Fields" of Carbonifero-Permian age, including therein coal measures of the Styx, Wycarbah, and Burrum districts. Rands (1892) assigned the Styx beds to the Mesozoic, but was undecided whether to correlate them with the Ipswich or Burrum Formations. Jack and Etheridge (1892) tentatively included them in their Burrum Formation, thus assigning them to a Lower Trias-Jura age. Dunstan (1913) placed his Ipswich-Tiaro-Styx Series in the Trias-Jura. Dunstan (1915) elevated the Styx Series to a doubtful equivalent of the Walloon Series of Jurassic age. Dunstan (1916) included the Styx coal measures in his re-defined and very comprehensive Walloon Series of Jurassic age. Walkom (1919) referred the Styx Series to the Lower Cretaceous, and stated that it

was somewhat younger than the Burrum Series. David (1932) placed "the STYX COAL-MEASURES 4,400 feet thick, in Albian to perhaps early Cenomanian time," and stated that "*Taeniopteris spatulata* reaches its highest horizon here."

R. L. Jack: Hbk. Qld. Geol., 1886, pp. 5, 6, 54.

W. H. Rands: Q.G.S.P., No. 84, 1892, p. 3.

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 300.

B. Dunstan: Qld. Min. Index, 1913, Pl. 0; Q.G.S.P., No. 252, 1915, Introduction; Harrap's Geography, 1916, p. 167.

A. B. Walkom: Q.G.S.P., No. 263, 1919, p. 52.

T. W. E. David: Explanatory Notes, 1932, Table H and p. 85.

SWAN CREEK SANDSTONE (Richards, 1919).—

A sandstone within the Walloon Series, used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 132.

T

TABLELAND SANDSTONES (Dunstan, 1901).—

Massive, horizontally-bedded sandstones with a characteristic topography. Referred to the Desert Sandstone of ? Upper Cretaceous age.

[Formations with this lithology, attitude and topography are, however, not restricted to any one age. See Redcliffe Series.]

B. Dunstan: Q.G.S.P., No. 155, 1901, p. 23.

TAMBO SERIES (Whitehouse, 1926).—

The upper of the two main series into which he divided the Rolling Downs Formation. Assigned to the *orbignyi* and *varicosus* zones of the Upper Albian of the Cretaceous.

Whitehouse (1930) emphasised the important stratigraphical break below the Tambo Series where the whole of the Lower and Middle Albian sequence is missing. David (1932) agreed with Whitehouse in placing the sediments (over 1,000 feet thick) in the Upper Albian.

F. W. Whitehouse: Mem. Qld. Mus., 8, 1926, p. 198; P.R.S.Q., 38, 1927, p. 111; Hbk. Qld. A.A.A.S., 1930, p. 37.

T. W. E. David: Explanatory Notes, 1932, Table H and p. 85.

TATE RIVER SERIES (Etheridge, Junr., 1880).—

Name based on certain Cretaceous fossils including "*Crioceras jackii*" submitted to him from Northern Queensland.

This serial name did not come into general use. The series was embraced by Jack's Rolling Downs Formation. Whitehouse (1926) included it in his Roma Series.

R. Etheridge, Junr.: Proc. Roy. Phys. Soc. Edin., 1880, p. 5.

F. W. Whitehouse: Mem. Qld. Mus., 8, 1926, p. 209.

TEMPLETON SERIES (Whitehouse, 1930).—

Sandstones, siltstones, banded cherts and other non-calcareous fossiliferous marine sediments, apparently unconformable upon the Cloncurry Series, assigned to the Cambrian.

Until the discovery of fossils in them, these beds were included in the very extensive Cloncurry Series. Saint-Smith (1924) collected trilobites which Dun (1924) regarded as of Lower Cambrian age. Whitehouse (1927) favoured Middle Cambrian. Chapman (1929) regarded them as of Middle to Upper Cambrian. Whitehouse (1930) divided the series into a lower *Redlichia* Stage "representing an horizon about the junction of the Lower and Middle Cambrian and an upper *Dinesus* Stage" in the lower half of the Middle Cambrian. David (1932) listed the TEMPLETON RIVER and YELVERTOFT BEDS as of Middle Cambrian age. Whitehouse (1936, 1940) extended the term to include certain limestones of the Barkly Tableland. He redivided the series into four stages the lowest of which, the *Redlichia* stage, he placed as uppermost Waucobian; the succeeding *Amphoton*, *Inouyella* and *Dinesus* Stages he bracketed as the *Kootenia* Group and assigned it to the Acadian. Whitehouse (1939) replaced the stage name *Inouyella* by *Eurostina*. Whitehouse (1941) stated that all the beds (Middle Cambrian) from the top of the *Redlichia* Stage to the top of the *Dinesus* Stage may be placed in the one *Xystridura* zone.

E. C. Saint-Smith: Q.G.M.J., 1924, p. 411.

W. S. Dun: Q.G.M.J., 1924, p. 411.

F. W. Whitehouse: P.R.S.Q., 1927, p. viii; Hbk. Qld. A.A.A.S., 1930, p. 27; Mem. Qld. Mus., 11, 1936, pp. 65, 73, 78; 11, 1939, pp. 264-5; Univ. Qld. Papers, Dept. Geol., 2 (n.s.), No. 1, 1940, p. 47; Mem. Qld. Mus., 12, 1941, p. 2.

F. Chapman: Proc. Roy. Soc. Vict., 41 (n.s.), Pt. 2, 1929, pp. 206-216.

T. W. E. David: Explanatory Notes, 1932, p. 29.

TEXAS LIMESTONE (Ball, 1923).—

Coralline limestone associated with manganiferous and jasperoid shales and schistose slate, assigned to the Carboniferous.

Reid (1930) placed this in the Rockhampton Series of Lower Carboniferous age. Hill (1934) regarded it as possibly Visean. Hill (1943) correlated it with the Riverleigh, Cania, Cannindah [Lower], and Lion Creek limestones, placing it in the Visean but possibly Moscovian.

L. C. Ball: Q.G.M.J., 1923, p. 457.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 15 and p. 35.

D. Hill: P.R.S.Q., 45, 1934, p. 105; 54, 1943, p. 63; Table opp. p. 64.

"THE WALL" SANDSTONE (Jack, 1878).—

A sandstone horizon in the Middle Bowen Series in the type area.

Reid ((1929) placed it at the base of the marine beds of the Middle Bowen Series.

R. L. Jack: Q.G.S.P., No. 4, 1878, p. 10.

J. H. Reid: Q.G.S.P., No. 276, 1929, p. 67.

THIRD BED OF SLATE (Rands, 1889).—

A thickness of 286 feet of shales, greywacke, etc., within the Gympie Series.

Dunstan (1912) placed this in his Lower Gympie Formation.

W. H. Rands: Q.G.S.P., No. 52, 1889, p. 3.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

THIRD SLATE GROUP (Dunstan, 1912).—

The lowest slate group of his Middle Gympie Series of Permo-Carboniferous age in the type district.

[Not to be confused with Rands' (1889) Third Bed of Slate but approximately equivalent to his *Second* Bed of Slate.]

W. H. Rands: Q.G.S.P., No. 52, 1889, p. 3.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

THIRD VOLCANIC (DIABASE) GROUP (Dunstan, 1912).—

The lowest of the three volcanic groups of his Middle Gympie Series of Permo-Carboniferous age in the type district.

This includes the Gympie Greenstone of Rands (1889).

W. H. Rands: Q.G.S.P., No. 52, 1889, p. 3.

B. Dunstan: Q.G.S.P., No. 221, 1912, Map.

TIARO SERIES (Dunstan, 1914).—

Name used for a coastal series of coal measures conformably underlying the Maryborough (Marine) series and equivalent to the coal beds north of Roma.

Rands (1890) in an account of the Geology of the "Tiaro District" wrote "The greater part of this country is composed of rocks belonging to the Burrum coal measures series. It is a continuation of the Burrum coal field . . . ." This belief was held for many years, together with the opinion that the Burrum Series was older than the Ipswich Series. Hence the Tiaro Series was regarded as older than the Ipswich Series. Dunstan (1911) showed that the Burrum Series was above the Maryborough Series (of Cretaceous age), while the Tiaro coal measures lay beneath the Maryborough Series and were equivalent to the Walloon Series. The latter decision disposed of another widely accepted belief that the supposed southern end of the Burrum Series (i.e. the Tiaro Series) was continuous in the field with the Ipswich Coal Measures. Jensen (1925) persisted that the Tiaro series was of Ipswich age. Bryan and Massey (1926) divided the Tiaro Series into four series namely, in descending order: Graham's Creek Series, Tiaro Series (in a new restricted sense), Myrtle Creek Series, and Broowena Series. They further suggested that the last three were to be correlated with the Walloon Series, Bundamba Series and Ipswich Series respectively. The effect of this new arrangement was to restrict the term "Tiaro Series"

to certain coal measures which in lithological type, thickness and fossil content were more closely comparable with the Walloon Series than was the formation as a whole. David (1932) divided the Tiaro Series (in the restricted sense of Bryan and Massey) into two stages, the lower of which probably descends to the Lias and the upper of which ascends into the Cretaceous.

B. Dunstan: Ann. Rept. Qld. Dept. Mines, 1911, p. 195; Rept. Second Artesian Water Conference, 1914, p. 7.

W. H. Rands: Q.G.S.P., No. 59, 1890, p. 1.

H. I. Jensen: P.R.S.Q., 36, 1925, p. 139.

W. H. Bryan and C. N. Massey: P.R.S.Q., 37, 1926, p. 108, *et seq.*

T. W. E. David: Explanatory Notes, 1932, Table G.

TIVOLI COKING COAL BELT (Dunstan, 1916).—

One of his four divisions of the Ipswich Coal Series of Triassic age.

B. Dunstan: Harrap's Geography, 1916, p. 168.

TOKO SERIES (Whitehouse, 1936).—

Name proposed in place of his Glenormiston Series, *q.v.*, for fossiliferous beds in the Toko Range (Cairns Range), Western Queensland, "since although the series occurs on Glenormiston, the greater part of that property is occupied by Cambrian beds." He stated that "the series begins with a rich cephalopod limestone . . . . Above . . . . lie horizontal sandstones with asaphid trilobites. This appears to be a Middle Ordovician group, the cephalopod limestone being the equivalent of the Black River Stage in America."

Kobayashi (1940) proposed the names Actinoceroid Zone and Asaphid Zone respectively for Whitehouse's divisions. He assigned the series as a whole to the Caradocian placing the Actinoceroid Zone, as equivalent to the Black River Stage and possibly part of the Trenton, and the Asaphid Zone as Trenton or younger. See Glenormiston Series.

F. W. Whitehouse: Mem. Qld. Mus., 11, 1936, p. 63, text-fig. 2, p. 68.

T. Kobayashi: Jap. Jour, Geol. and Geog., 17, 1940, pp. 123, 124.

TOLMIES SERIES (Dunstan, 1913).—

Coal Measures of Permo-Carboniferous age in Central Queensland, placed above his Upper Bowen (Fresh Water) Series.

Part of his comprehensive Clermont-Tolmies-St. Mary's Series.

B. Dunstan: Qld. Min. Index, 1913, Pl. 33.

TRACHYPORA WILKINSONI HORIZON (Richards and Bryan, 1925).—

Shown as a definite horizon within their Condamine Beds and used as a basis for correlation. It was placed in the upper part of the Permo-Carboniferous sequence.

Bryan (1928) equated it with similar beds at Cressbrook Creek near Esk, and Lakes Creek near Rockhampton and stated that "the uniform lithological type of the *Trachypora* horizon and curious faunal assemblage [including *Monilopora nicholsoni*] make this horizon . . . . one of great importance as a datum." Reid (1930) stated that this fossil is present in his Gympie Series and ascends to the middle of his Lower Bowen. David and Sussmilch (1931) referred to the "Chief horizon of *Trachypora wilkinsoni* and *Monilopora nicholsoni* marking the top of the Upper Carboniferous" in the Springsure district.

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 69.

W. H. Bryan: A.A.A.S., 19, 1928, p. 74.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 60, 68, 69.

T. W. E. David and C. A. Sussmilch: Bull. Geol. Soc. Amer., 42, 1931, p. 502.

TRANSITION BEDS (Ball, 1927).—

Sandstones and shales, in the Roma area containing both marine and fresh water fossils, which he stated "should be classified either as Lower Cretaceous or else as *Transition Beds* from the fresh water Jurassic coal measures to the Marine Cretaceous sediments."

Jensen (1929) stated that the TRANSITION SERIES is the equivalent of his Upper Walloon.

See Blythesdale Braystone.

L. C. Ball: Q.G.M.J., 1927, p. 94.

H. I. Jensen: Q.G.M.J., 1929, p. 282.

TRIAS-JURA (Jack and Etheridge, 1892).—

Synonyms found in the literature are TRIA-JURASSIC and JURA-TRIAS. A comprehensive term designed primarily to bring closer together and into the one period the Burrum Formation and the Ipswich Formation. These had previously been regarded as separated by a wider time interval, and had been assigned to the Triassic and Jurassic periods respectively. By the use of the new term the Burrum Formation was referred to the Lower Trias-Jura. Cameron (1907) divided the Trias-Jura System into two stages. The lower of these embraced the lower two-thirds of Jack's Ipswich Formation and all of the Burrum Series (which Cameron regarded as equivalent). The upper stage (originally the upper third of Jack's Ipswich Formation) was called by Cameron the Walloon Beds, and was represented by the coalfields of Walloon, Purga, and the Darling Downs. Cameron further divided the lower stage in the type district into the Ipswich Beds overlain by the Bundamba Beds. Cameron's Ipswich Beds thus represented the lowest third of Jack's Ipswich Formation. Marks (1910) modified Cameron's classification by removing the Bundamba Beds from the upper part of the Lower Stage and constituting with them a Middle Stage. Although the term Stage was afterwards abandoned, Marks' useful tripartite arrangement of the Trias-Jura was accepted by all. Dunstan (1911), by showing that the Burrum Series was younger than the Maryborough Series (Cretaceous) removed the former not only from the Lower Trias-Jura, but from the system altogether. Walkom (1915) after examining the floras of the Ipswich and Walloon Series concluded that the former should be regarded as Triassic (Rhaetic) and the latter as Jurassic (Liassic or Lower Oolite). As a result of this, Dunstan (1915) officially abandoned the term Trias-Jura but retained Marks' three-fold division, placing both the Ipswich and Bundamba Series in the Triassic and the Walloon Series in the Jurassic. Although he did not use the term Trias-Jura, David (1932) stated that "There does not appear to have been any definite angular unconformity or any considerable overlap in Queensland between the base of the Jurassic strata and the top of the Triassic rocks."

R. L. Jack and R. Etheridge: Geol. of Qld., 1892, p. 312.

W. E. Cameron: Q.G.S.P., No. 204, 1907, p. 17.

E. O. Marks: Q.G.S.P., No. 225, 1910, p. 10.

B. Dunstan: Ann. Rept. Qld. Dept. Mines, 1911, p. 195; Q.G.S.P., No. 252, 1915, Introduction.

A. B. Walkom: Q.G.S.P., No. 252, 1915, p. 37.

T. W. E. David: Explanatory Notes, 1932, p. 79.

TRIASSIC AND JURASSIC FLORAL STAGES (Whitehouse, 1932).—

Whitehouse suggested the following four stages for the Lower Mesozoic Sediments of Queensland:

4. A Middle Jurassic Stage, characterised particularly by *Otozamites, Sagenopteris, Taeniopteris spathulata* and *Phlebopteris* (*? Lacopteris*), but without *Thinnfeldia.*
3. A Lower Jurassic (Liassic) Stage, characterised by the association of *Taeniopteris spathulata,* with *Thinnfeldia* and having present also *Ptilophyllum, Coniopteris hymenophylloides, Araucarites, Anomozamites, Johnstonia* (?), *Linguifolium,* etc.
2. An Upper Triassic Stage without *Taeniopteris spathulata* and characterised by normal forms of *Thinnfeldia, Stenopteris spp. nov., Sphenopteris superba, Yabeiella, Fraxinopsis, Linguifolium, Dictyophyllum, Ginkgoites,* etc.
1. A Lower Triassic Stage characterised by abundant *Schizoneura,* species of *Thinnfeldia* with very large pinnules, *Glossopteris, Asterotheca, Linguifolium, Yabeiella, Fraxinopsis, Nilssonia,* etc.

F. W. Whitehouse: P.R.S.Q., 43, 1932, p. xv.

TRIPOLITE DEPOSITS (Dunstan, 1916).—

These are found between Tertiary basaltic lava flows and contain dicotyledonous leaves in several places in South-east Queensland. Listed as Tertiary.

B. Dunstan: Harrap's Geography, 1916, p. 164.

TROPAEUMAN STAGE (Whitehouse, 1927).—

The stage above his *Australiceratan* and below his *Ammonitoceratan* Stage, being the third in ascending order of the four Aptian stages into which he divided his Roma Series.

David (1932) placed the "TROPAEUM STAGE" as the *fourth* within the Aptian.

F. W. Whitehouse: Q.G.M.J., 1927, p. 145; A.A.A.S., 18, 1928, p. 276.

T. W. E. David: Explanatory Notes, 1932, Table H.

TRUE GYMPIE (Jensen, 1910).—

A term for the fossiliferous Permo-Carboniferous strata of the Gympie Goldfield.

[This term is practically synonymous with Dunstan's (1913) Middle Gympie (Gold) Series, and Reid's (1930) Monkland Series, both of which refer to the "Gympie Beds" in the original sense.]

H. I. Jensen: A.A.A.S., 12, 1910, p. 259.

B. Dunstan: Qld. Min. Index, 1913, Pl. 0.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 10.

TUMBLEDOWN FORMATION (Jensen, 1926).—

About 1,200 feet of alternating beds of yellow sandstone and red clay, developed south of Rewan. The highest of the four divisions into which he divided his Middle Bowen Series, as developed in the Springsure-Roma area.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 143.

TURQUOISE BELT.—

Synonym for "Phosphate Belt."

[Term in common use but never formally proposed.]

U

UKALUNDA SERIES (David, 1932).—

Greenish shales and limestones with Calceola (?), placed tentatively in the Eifelian division of the Middle Devonian, but possibly Lower Devonian.

Jack (1889) originally referred these beds to the Gympie Formation. Whitehouse (1929) had described the "Ukalunda fauna" as probably Eifelian and indicative of the presence in the Eastern Australian province of a definite *Schizophoria–Leptostrophia* horizon (below that of the neighbouring Mt. Wyatt *Spirifer disjunctus* horizon).

R. L. Jack: Q.G.S.P., No. 57, 1889, p. 1.

F. W. Whitehouse: Q.G.M.J., 1929, pp. 158-9.

J. H. Reid: Q.G.S.P., No. 278, 1930, pp. 15, 18, 27.

T. W. E. David: Explanatory Notes, 1932, pp. 28, 56 and Table C.

ULAM MARBLE (Richards, 1919).—

A white marble which is quarried some 25 miles south of Rockhampton.

[The marble is probably of Devonian age.]

H. C. Richards: P.R.S.Q., 30, 1919, p. 140.

UPPER COAL MEASURES (Dunstan, 1916).—

A comprehensive term to embrace the coalfields at Clermont and Tolmies, including the famous Blair Athol coal seam. Assigned to the Permo-Carboniferous.

This is the highest of the four "Series" to which Dunstan (1916) referred all the Permo-Carboniferous beds of Queensland. The others in descending order are the Upper Marine Series, Lower Coal Measures, Lower Marine Series.

B. Dunstan: Harrap's Geography, 1916, p. 168.

UPPER MARINE SERIES (Dunstan, 1916).—

A comprehensive term to include fossiliferous sandstones, shales and limestones at Bowen River, Nebo, Broad Sound, and Mackenzie River.

This is one of the four "Series" to which Dunstan (1916) referred all the Permo-Carboniferous beds of Queensland. Above are the Upper Coal Measures, and below in descending order, the Lower Coal Measures and Lower Marine Series.

B. Dunstan: Harrap's Geography, 1916, p. 169.

UPPER SANDSTONE STAGE (Reid and Morton, 1922).—

Defined as the upper division of the Borallon Series.

This name lapsed when the Borallon Series was withdrawn.

J. H. Reid and C. C. Morton: Q.G.M.J., 1922, p. 358.

V

VOLCANIC ASHY SANDSTONE (Rands, 1887).—

Early name for Brisbane Tuff.

W. H. Rands: Q.G.S.P., No. 34, 1887, p. 1.

VOLCANIC STAGE (Reid and Morton, 1923).—

Synonym for Andesitic Stage (of the Esk Series).

J. H. Reid and C. C. Morton: Q.G.M.J., 1923, p. 7.

W

WAIRUNA BEDS (Gibb Maitland, 1891).—

An extensive series of "reddish beds" in the basin of the Upper Burdekin, equated with the Burdekin Beds of Devonian age. The series consists of two sub-divisions, the upper of reddish shales and sandstones and the lower of dark shales, grits and greywackes.

David (1932) reintroduced this serial name, placing the series in the Upper Devonian and above the Middle Devonian Burdekin Series.

[These beds may include equivalents of the Dalrymple and Dotswood Series.]

A. Gibb Maitland: Q.G.S.P., No. 71, 1891, p. 5.

T. W. E. David: Explanatory Notes, 1932, Table C.

WALLABY BEDS (Richards and Bryan, 1925).—

A division of their Fault Block Series of Permo-Carboniferous age in the Silverwood-Lucky Valley area, subdivided into lower (fresh water) beds with *Gangamopteris* (200 feet) and upper (marine beds) with *Strophalosia* (200 feet). The beds were regarded as younger than the *Eurydesma* Beds and as possibly equivalent to the lower part of the Condamine Beds.

Voisey (1935) placed them as the highest beds of the Fault Block Series, which he (1936, 1939) stated is "to be considered Lower Permian in age."

H. C. Richards and W. H. Bryan: P.R.S.Q., 36, 1925, p. 67.

A. H. Voisey: P.R.S.Q., 46, 1935, p. 60 *et seq.* (but see also p. xiv); Proc. Linn, Soc. N.S.W., 1936, p. 163; 1939, p. 389.

WALLOON, BASAL (Jensen, 1926).—

The lowest of the four stages into which he divided the Walloon Series in the Roma district. It consists for the most part of a somewhat felspathic sandstone, and is succeeded by his Lower Walloon.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 24.

WALLOON, LOWER (Jensen, 1926).—

Also referred to as CALCAREOUS WALLOON; one of the four stages into which he divided the Walloon Series as developed north of Roma. It consists of calcareous sandstones, mudstones, and shales with frequent coal seams.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 24.

WALLOON, MIDDLE (Jensen, 1926).—

One of the four stages into which he divided the Walloon Series as developed north of Roma. It consists of sandstones and shales with frequent coal seams. At the base of the stage is the Big Sandstone.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 24.

WALLOON SERIES (Cameron, 1907).—

Cameron described as the WALLOON BEDS a series of fresh-water sediments "represented by the coalfields of Walloon, Purga, and the Darling Downs," and assigned them to the Trias-Jura.

Gregory (1879) pointed out the difference both in type of coal and in associated plant fossils between the coal measures of the Walloon and Darling Downs, which he classed as Newer Coals, and those in and about Ipswich which he classed as Older Coals. He thought two distinct periods were represented. Both classes were, however, included in his Carbonaceous (Mesozoic). Gregory's valuable distinctions were not made use of, and the Walloon coal measures remained incorporated in the Ipswich Beds for very many years.

Even Cameron (1899), who made a detailed study of the area, failed to recognise the Walloon coal measures as an independent unit. Later, however, Cameron (1907), as a result of further and more detailed observations, suggested the division of the Trias-Jura System into two stages, the upper of which was occupied by what he now termed the Walloon Beds and the lower of which included the Ipswich Beds. Marks (1910) modified Cameron's arrangement by removing the Bundamba Grits from the upper part of Cameron's Lower Stage and constituting with them a Middle Stage, separating the Upper (Walloon) coal measures from the Lower (Ipswich) coal measures. Dunstan (1913) placed the Walloon Series as the highest of three series listed as Trias-Jura ? and correlated it with the Darling Downs Series and the Waterpark Series. (The last has since been assigned to the Tertiary era.) Dunstan (1915) abandoned the term Trias-Jura and placed the Walloon Series in the Jurassic. Walkom (1915) having suggested a Lias or Lower Oolitic age for the contained flora, the outstanding members of which are *Taeniopteris spatulata* and *Cladophlebis australis*, Dunstan (1916) redefined the "Walloon Series" and extended its geographical scope to: (1) a western group of localities ranging from Cape York Peninsula to Texas, and (2) an eastern group of localities found as isolated occurrences between Cooktown and Moreton Island. The series as thus redefined absorbed part of the Desert Sandstone and all the Blythesdale Braystone. Dunstan further stated that the Walloon Series "underlies nearly the whole of the Rolling Downs of Western Queensland and includes all artesian water-bearing strata." The series was listed as Jurassic. Reid (1922) assigned the Walloon Series to Upper (?) Jurassic. Jensen (1925) divided the Walloon Series into Upper Walloon which he regarded as "practically passage beds between the Jurassic and the Cretaceous" and Lower Walloon which he assigned to the Lower Jurassic. Jensen (1926), as a result of investigations to the north of Roma, recognised four stages of the series which he named in descending order (1) Upper Walloon, (2) Middle Walloon, (3) Lower Walloon or Calcareous Walloon, (4) Basal Walloon. Whitehouse (1927) thought the Walloon Series persisted into Neocomian times. Whitehouse (1930) included as the lower part of the Walloon Series the soft, massive sandstones which Reid (1922) had named the Marburg Stage and had equated with the Bundamba Series. Whitehouse (1930) further stated that there is some reason to believe that the junction with the underlying Bundamba sandstone is disconformable. David (1932) stated that "there does not appear to have been any definite angular unconformity or any considerable overlap in Queensland between the base of the Jurassic strata and the top of the Triassic rocks." He used the term Walloon Series in a broad sense to cover beds above the Marburg Sandstone series, ranging from the Liassic probably into the Lower Cretaceous, and including his Rosewood-Walloon Series. Whitehouse (1942) regarded his Cunno Series as equivalent to and absorbed in the Walloon Series.

W. E. Cameron: Q.G.S.P., No. 145, 1899; No. 204, 1907, p. 17.

A. C. Gregory: Qld. Parliamentary Papers, 1879, p. 369.

E. O. Marks: Q.G.S.P., No. 225, 1910, p. 10.

B. Dunstan: Qld. Min. Index, 1913, Pl. 0; Q.G.S.P., No. 252, 1915; Introduction; Harrap's Geography, 1916, p. 167.

A. B. Walkom: Q.G.S.P., No. 252, 1915, p. 37.

J. H. Reid: Q.G.S.P., No. 272, 1922, Map.

H. I. Jensen: Q.G.M.J., 1925, p. 459; Q.G.S.P., No. 277, 1926, p 24.

F. W. Whitehouse: P.R.S.Q., 38, 1927, p. 107; Qld. Hbk. A.A.A.S., 1930, p. 35; P.R.S.Q., 53, 1942, p. 13.

T. W. E. David: Explanatory Notes, 1932, pp. 79, 81, and Table G.

WALLOON, UPPER (Jensen, 1926).—

The uppermost of the four stages into which he divided the Walloon Series, as developed north of Roma. It consists of fine-grained porous sandstones and interbedded shales, contains a few coal seams, and has a conglomerate bed at its base.

H. I. Jensen: Q.G.S.P., No. 277, 1926, p. 24.

WALLOON-WATERPARK SERIES (Dunstan, 1913).—

Also referred to as the WALLOON-DARLING DOWNS-WATERPARK SERIES. This name was based on the supposed equivalence of the Walloon Coal Measures and the Waterpark Coal Measures.

[Since the former are known to be Jurassic and the latter are now thought to be Tertiary, the compound name is no longer used. See Waterpark Coal Series.]

B. Dunstan: Qld. Min. Index, 1913, Pl. 3.

WALLUMBILLA BEDS (Etheridge, Senr., 1872).—

Fossiliferous marine series assigned to the "Lias and Oolite," and placed as the upper of his two "Oolitic" Series.

These beds were afterwards embraced by Jack's very comprehensives Rolling Downs Formation. Whitehouse (1926) included them in his Roma Series.

R. Etheridge, Senr.: Q.J.G.S., 1872, p. 325.

F. W. Whitehouse: Mem. Qld. Mus., 8, Pt. 3, 1926, p. 196.

WALSH RIVER BEDS (David, 1932).—

"On the Walsh River a Lower Jurassic ammonite, *Coroniceras*, is alleged to have been found, but the locality is doubtful."

See Coroniceratan Stage.

[N.B.—Walsh River is also a locality rich in marine Cretaceous fossils of the Roma Series.]

T. W. E. David: Explanatory Notes, 1932, p. 81 and Table G.

WARWICK SANDSTONES (Richards, 1919).—

A sandstone within the Walloon Series used as a building stone.

[These do not form part of Andrews' 1908 Warwick Series.]

H. C. Richards: P.R.S.Q., 30, 1919, p. 133.

WARWICK SERIES (Andrews, 1908).—

"Intensely folded and faulted" Palaeozoic strata between Warwick and Stanthorpe, from some of which Permo-Carboniferous fossils have been obtained.

Richards and Bryan (1925) showed that this "series" is made up in part of marine Devonian strata (Silverwood Series) and in part of marine and fresh-water Permo-Carboniferous beds (Fault Block Series).

[Not to be confused with Warwick Sandstones (Richards, 1919) which are of Mesozoic age.]

E. C. Andrews: Min. Res. N.S.W., No. 12, 1908, p. 41.

H. C. Richards and W. H. Bryan: P.R.S.Q., 1925, p. 44.

WATERPARK COAL SERIES (Cameron, 1902).—

Sometimes known as Port Clinton Coal Series. A series of fresh-water deposits containing several seams of brown coal occurring in a comparatively small basin about 40 miles north of the mouth of the Fitzroy River. Assigned tentatively by him to the Trias-Jura.

Dunstan (1913) bracketed the series with the Walloon Coal Measures as the Wallon Waterpark Series, which he regarded as of Trias-Jura age. Dunstan (1916) separated the Waterpark Coal Series from the Walloon Series and placed it in the Tertiary. Reid (1929) confirmed this placement. David (1932) assigned the series to the Miocene.

W. E. Cameron: Q.G.S.P., No. 174, 1902, p. 2.

B. Dunstan: Qld. Min. Index, 1913, Pl. 3; Harrap's Geography, 1916, p. 165.

J. H. Reid: Q.G.M.J., 1929, p. 6.

T. W. E. David: Explanatory Notes, 1932, Table I.

WINTON SERIES (Dunstan, 1916).—

Sandstones and shales with small unproductive coal seams at Winton, Marathon, Hughenden, etc. Conformable above the Rolling Downs Marine Series. Regarded as equivalent to the Burrum Coal Series and placed in the upper, part of the Cretaceous.

Dunstan (1916) erected this series to separate, as a distinct unit, those portions of the Desert Sandstone formation which were definitely younger than the Rolling Downs formation, from the remainder of the Desert Sandstone, different parts of which had been assigned to several different periods. Dunstan (1922) assigned the series to the Cretaceo-Tertiary. Jensen (1925) also thought the WINTON BEDS best regarded as of that age. Whitehouse (1930) wrote that it conformably succeeds the Tambo Series and he therefore tentatively assigned it to the Cenomanian and Turonian. David (1932) also placed the series within the Cenomanian with a possible extension into the Turonian and thus correlated it in part with the Styx Coal Measures.

B. Dunstan: Harrap's Geography, 1916, p. 166; Qld. Artesian Water Map, 1922.

H. I. Jensen: Q.G.M.J., 1925, p. 461.

F. W. Whitehouse: Qld. Hbk. A.A.A.S., 1930, p. 37.

T. W. E. David: Explanatory Notes, 1932, Table H.

WONDAI SERIES (Reid, 1925).—

A series of quartzites, slates, jaspers, limestones, shales, etc., in the neighbourhood of Wondai. Regarded as of Lower Palaeozoic age.

Ball (1918) had noted the resemblance of the rocks of this series to the Devonian rocks of Gladstone. Saint-Smith (1923) thought the shales of this series so like those of the Mount Isa Series that he suggested a Pre-Cambrian age for them.

[The series is probably equivalent to portion of the Brisbane Schists.]

J. H. Reid: Q.G.M.J., 1925, p. 87.

L. C. Ball: Q.G.M.J., 1918, p. 207.

E. C. Saint-Smith: Q.G.M.J., 1923, p. 412.

X

XYSTRIDURA ZONE (Whitehouse, 1941).—

A comprehensive zone in the Templeton Series embracing all the beds (Middle Cambrian) from the top of the *Redlichia* Stage to the top of the *Dinesus* Stage. The zone includes his (1936, 1939) *Amphoton* and *Eurostina* (*Inouyella*) Stages.

F. W. Whitehouse: Mem. Qld. Mus., 12, 1941, p. 2.

Y

YANGAN SANDSTONE (Richards, 1919).—

A sandstone within the Walloon Series used as a building stone.

H. C. Richards: P.R.S.Q., 30, 1919, p. 131.

YARROL BEDS (Reid, 1930).—

Marine strata correlated with his Gympie (Transition) Series.

Ridgway (1937) described these as shales, cherts, conglomerates, limestones and tuffaceous sediments with a number of fossiliferous horizons containing crinoid stems, bryozoa and brachiopods. He stressed differences in lithology and structures from those of the neighbouring Cannindah beds.

J. H. Reid: Q.G.S.P., No. 278, 1930, p. 60.

J. E. Ridgway: Q.G.M.J.. 1937, p. 160.

YATTON LIMESTONE (Whitehouse, 1928).—

Term used for the limestone in the uppermost portion of the Lower Bowen Series of the Yatton-Nebo area. Correlated with the base of the Middle Bowen Marine Series in the Mount Britton area.

Reid (1926) had used the term Lower Limestone to include this and similar fossiliferous beds at Mount Bora, etc., which he placed within the Bowen Series. Whitehouse (1928, 1929) correlated this horizon with the Collinsville Coal Measures and the Lakes Creek Beds. Reid (1930) could not "accept as even probable" this correlation and placed the limestone in his Lower Bowen. Hill (1943) correlated it tentatively with the Dilly Marine Stage, placing it in the Artinskian or possibly on the Basleo horizon of the Middle Permian.

J. H. Reid: Q.G.M.J., 1925, p. 465; 1926, p. 12; Q.G.S.P., No. 278, 1930, p. 45.

F. W. Whitehouse: Q.G.M.J., 1928, p. 286; A.A.A.S., 19, 1929, p. 75 .

D. Hill: P.R.S.Q., 54, 1943, Table opp. p. 64.

YELVERTOFT BEDS (David, 1932).—

Portion of his Templeton River and Yelvertoft Beds. See Templeton Series.

T. W. E. David: Explanatory Notes, 1932, p. 29.

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