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E.R. ROTHERAM photos

GROWTH OF THE MINERAL, ROCK, METEORITE AND TEKTITE COLLECTIONS IN THE NATIONAL MUSEUM OF VICTORIA

By A. W. Beasley
Curator of Minerals, National Museum of Victoria

Abstract

The rate of growth of the Collections has varied considerably during different periods since the Museum was founded 115 years ago. Growth was rapid during the period when the first Director, Professor McCoy, made numerous purchases of overseas minerals and rocks. When there was no full-time Curator of the Collections, and during periods when there was no Curator, the rate of growth was generally slow and erratic. The Collections began to increase markedly in size and importance following the appointment of a full-time Curator in 1946, and this increase has been maintained to the present time. Beneficial results also followed the appointment of Honorary Associates in Mineralogy, and through them many hundreds of specimens have been donated. During the past 115 years large numbers of specimens have been amassed, and the collection of overseas minerals and rocks is the most extensive in an Australian museum.

Much information is recorded for the first time, and references are given to publications associated with this historical research. As the Collections of minerals, rocks, meteorites and tektites have grown they have been arranged more systematically, and greater use has been made of them by the general public, students and research workers. This increase in use of the Collections is continuing and may be related to greater interest, particularly in economic geology, planetary science, gemmology and lapidary.

Introduction

During the past 19 years the author has gained a close knowledge of and witnessed considerable growth in the mineral, rock, meteorite and tektite collections under his curatorship at the National Museum of Victoria. This paper places on record information concerning this growth together with that during the preceding 96 years. The history of the first hundred years of the Museum has been recorded by Pescott (1954), but no specific research into the growth of any of the departmental collections has previously been recorded. Registers, catalogues, lists and correspondence dating back to the very early days of the Museum have been examined.

The geological collections have been built up through the years in various ways. The nucleus came from purchases, but considerable additions came through donations from individuals and mining companies. The collections have also been augmented by exchanging duplicate materials with organizations and private collectors. Additions have been made by Museum staff members collecting specimens on official field excursions and on other occasions.

Foundations—1854 to 1870

The foundations of the present extensive collections were laid through the efforts of Professor Frederick McCoy, who was appointed Director of the National Museum in 1858. Prior to his appointment, and following the establishment of the Museum in 1854, a small collection of minerals and rocks had been assembled mainly through the efforts of Captain Andrew Clarke, Surveyor-General of Victoria, and Mr William Blandowski, the first official appointee to the Museum staff. Most of the specimens were of local origin and many were of economic significance, as in the early colonial days there was a natural emphasis on useful materials.

Professor McCoy was the Professor of Natural Science at the University of Melbourne and Palaeontologist of the Geological Survey of Victoria, as well as

being Director of the Museum. He was largely responsible for having the Museum located in the University grounds from 1856 to 1899. McCoy had formerly been Professor of Geology and Mineralogy in Belfast, and he was particularly interested in geology. He built up the collections mainly through purchases from the German dealer, Dr August Krantz of Bonn. Purchases of minerals, rocks and meteorites from Krantz were made mainly between 1858 and 1868. In 1858 a collection of 4,000 mineral specimens was purchased from Krantz for £200. The hand-written lists of these specimens are still used by the Mineralogy staff to check information. In 1860 a collection of 1,000 rock specimens was bought from the same dealer for £54. Almost all of the rock specimens had been trimmed to a size approximately 3 inches x 4 inches x 1 inch, which facilitated their storage in cabinets as cardboard tray dimensions could be standardized; it also helped in the arrangement of attractive displays, particularly those of a systematic nature. This rock collection contained a wide range of types from many different overseas localities. Fortunately, the Krantz numbers, printed on a small rectangular-shaped piece of paper glued near a corner of the specimen, have not been removed from the rocks and minerals.

Other purchases made from Krantz were for smaller numbers of specimens. In 1858 a collection of 324 cut and polished minerals and rocks (agate, serpentine, marble, etc.) and 60 'choice' mineral specimens were bought. The first meteorites in the Museum collection were purchased during 1859 in a collection which contained 42 specimens of polished carnelian, sardonyx and onyx. Two pieces of the Toluca meteorite (weighing 1 lb. 10¼ oz. and 1 lb. 3¼ oz.) from Mexico cost £7 7s. 0d. and £5 11s. 0d., while 24 small pieces of the Ilimaes meteorite from Chile cost only £1 11s. 0d. Most of the overseas meteorite specimens now in the Museum collection were purchased from Krantz. Further purchases made during 1860 consisted of 293 specimens of minerals and rocks (including ornamental stones), 110 mineral and rock specimens mainly from German localities, and 63 mineral specimens. Thirty mineral specimens of 'large size' were bought from Krantz for £30 in 1861, as well as a collection of 181 minerals which included many from Norway. The series of purchases continued in 1862 when 153 mineral specimens were purchased for £105 10s. 0d. and a set of rare economic minerals was bought for £30. During 1863 a collection of 80 mineral specimens was purchased and in 1864 some 154 rocks and 46 minerals were bought. The cost of the rock specimens was one shilling each. Ordering at about that time was starting to decrease, but 74 mineral specimens and two meteorites were bought in 1866; one of these was a 10¼ lb. piece of the Toluca meteorite (price £15) and the other a polished slice of the Verkine meteorite from Siberia. In 1868 specimens of several stony meteorites including the Pultusk meteorite from Poland and the Knyahinya meteorite from Czechoslovakia were purchased together with 62 mineral specimens.

The collections of overseas minerals and rocks purchased from Dr Krantz are particularly comprehensive and almost all of the specimens are of high quality. Many of the large attractive specimens are at present displayed in the Mineral Gallery. Special mention may be made of the beautiful polished agates from South America and India, the crystallized hematite from the Island of Elba and the outstanding manganite specimens from the Harz Mountains, Germany. These specimens are now worth many hundreds of dollars. As well as providing much material for Museum display, the Krantz collections have proved very useful for reference purposes, as they contain rare minerals and rocks, and specimens from type localities. In many cases it would be difficult or impossible to collect similar specimens now due to political barriers and because many localities have been worked out or are inaccessible. After reading the numerous hand-written letters from Dr

Krantz to Professor McCoy, it is clear that the Museum owes much to these men for its fine geological collection. Krantz's prices appear to be reasonable by present-day standards. It is apparent that McCoy kept on ordering collections although the Museum did not have the money to pay for them at the time. In many of Krantz's letters courteous requests are made for overdue payments, and there were some lengthy delays in the settlement of accounts.

In 1856 the Museum acquired a 1½ ton meteorite, known as the Cranbourne No. 2 meteorite, largely through the efforts of McCoy. This meteorite had been found several years previously about 2 miles E. of Cranbourne, Victoria, and had subsequently been despatched to the British Museum in London. The history of this meteorite following its discovery and prior to the time of its arrival at the National Museum has been described by Walcott (1915). It is the largest meteorite in the Museum collection and there is no larger meteorite in any other collection in E. Australia. Unfortunately, McCoy's endeavours to secure the Cranbourne No. 1 meteorite (3½ tons), found 3½ miles S. of Cranbourne, were unsuccessful; it was sent to the British Museum in 1865.

The Geological Survey of Victoria was closely associated with the National Museum in its early days. The Geological Survey Laboratory was housed in a room adjacent to the Museum in the University grounds, and specimens collected by Geological Survey officers were placed in the National Museum collection. Ulrich, one of the Geological Survey staff, made use of the specimens in the Museum collection in describing the mineral species of Victoria in an Intercolonial Exhibition Essay (Selwyn and Ulrich 1867). This was published as part of the Official Record of the Intercolonial Exhibition of Australasia held in Melbourne during 1866 and 1867. In 1868 'A Descriptive Catalogue of the Rock Specimens and Minerals in the National Museum collected by the Geological Survey of Victoria' was published. This was prepared by Selwyn, Director of the Geological Survey, and members of his staff, and listed specimens collected during the early geological mapping of the State—the work which produced the well-known quarter sheet series of maps. The rock specimens listed in the catalogue were transferred to the Geological Survey Museum at a later date, but the minerals (more than 250 specimens) as well as a number of australites were retained. It is interesting to note that the australites are listed as 'obsidian buttons' and an 'obsidian ball'. Although not recognized as such, they were the first australites in the Museum collection. In 1869 the Geological Survey of Victoria, a branch of the Mines Department, was terminated for economy reasons and the staff disbanded. Later it was re-established, but again in 1878 it was suspended. It is fortunate that many specimens collected by Geological Survey officers in those early days were lodged in the National Museum collection, for there could have been danger of specimens being lost during periods of suspension.

A 6½ lb. bluish-green, waterworn topaz was donated to the Museum in the late sixties. This specimen, portion of a very large crystal, had been found at a depth of 60 feet during alluvial mining in the Cooyal Creek area near Mudgee, N.S.W. Liversidge (1875, p. 203) and also Chalmers (1967) have referred to this outstanding topaz specimen.

It was not many years before Professor McCoy was experiencing considerable difficulty in finding space adequate to display and store the growing collections in the Museum. In making a request to the Government for the provision of more space, he indicated that he was unable to properly display specimens in the very important branch of economic geology. Space shortage gradually became worse, and in 1870 the mineral and rock collections were temporarily transferred to the newly formed Industrial and Technological Museum (now called the Institute of Applied Science of Victoria).

The Period 1870 to 1899

The Industrial and Technological Museum was opened in the Public Library building on 8 September 1870, with an inaugural lecture by Professor McCoy who had been one of the Commissioners recommending its establishment. For the next 29 years the National Museum mineral and rock collections were under the care of Industrial and Technological Museum staff which included Mr J. Cosmo Newbery, Mr (later Professor) G. H. F. Ulrich, Mr O. R. Rule and Mr R. H. Walcott. During this period there was a steady growth in the collections through donations and purchases.

Ulrich (1870) described certain specimens in the Museum collection in his 'Contributions to the Mineralogy of Victoria', and gave further information about maldonite, the new mineral species that he had named and described from Maldon, Victoria (Ulrich 1869).

An early acquisition was a collection of 275 rocks bought from Ward and Howell, dealers of Rochester, New York, U.S.A. The collection consisted largely of rocks from U.S.A., but also contained some fine specimens of 'landscape' marble from England as well as rock specimens from Germany and other foreign countries.

In 1886 an 18 cwt. nickel-iron meteorite was donated to the Museum by Mr A. H. Padley, following its discovery on his land about 5 miles SE. of Langwarrin railway station, Victoria. This meteorite became known as the Langwarrin meteorite and was later studied by Walcott (1915) and Edwards and Baker (1944) who recognized it as one of the Cranbourne meteorites, derived from the breaking up during flight of a single large mass of nickel-iron when close to the earth's surface.

In 1887 comprehensive collections of Italian rocks and minerals were acquired through the Mines Department of Victoria. It is interesting to note that the hand-written Catalogue which lists and describes each of 200 Italian rock specimens concludes with the word 'Amen'. The Italian collection of 100 minerals included many fine crystallized specimens from Sicily and Elba such as native sulphur, celestite, aragonite, hematite and pyrite. In August 1887, 800 minerals and 250 rocks from overseas localities, also belonging to the Mines Department, were transferred to the Museum. This was a particularly valuable acquisition; many of the specimens are rare and they come from localities widely scattered through the world. Most of these overseas specimens had come originally from the collection of the pioneer British mineralogist, Dr Thomas Thomson, but some came from Dr A. Krantz and other early collectors. At about the same time a representative collection of 50 mineral and rock specimens from Finland was acquired as well as suites of specimens from Borneo, Sumatra and other islands in the East Indian Archipelago. These came from the Geological Survey Departments of Borneo, Java, etc., and included rocks from Krakatoa, the volcano in Sunda Strait (between Sumatra and Java) which erupted with tremendous explosive violence in 1883.

In 1893 a collection of 300 mineral and rock specimens from Italy, France, Austria and Switzerland was purchased from Dr G. Jarvis of Turin, Italy. One hundred of these were volcanic rocks from Italy. A hand-written catalogue accompanying the collection gives a description of each specimen, precise locality information and data about the origin and uses of many of the rocks. This informative catalogue makes interesting reading, and is still used for checking and reference purposes.

In 1893 and the years immediately following, approximately 200 specimens of zeolite and secondary carbonate minerals from Victorian localities were donated to the Museum by Mr James Mitchell and Mr O. R. Rule who collected them from basalt quarries in Melbourne (Collingwood, Richmond and Footscray), as

well as from Phillip Island and near Flinders. The Melbourne basalt quarries are no longer accessible, and it is fortunate that the specimens were collected when the rock was being quarried.

A valuable donation came in 1895 from Mr A. E. Savage who presented a collection of minerals from Broken Hill, N.S.W., which contained fine specimens of cerussite, pyromorphite, smithsonite, embolite, stolzite and other secondary minerals from the oxidized zone of the silver-lead-zinc lode. This near-surface zone was soon worked out in mining operations, and such mineral specimens are now very rare.

At about this time use was made of the minerals in the Museum collection by Mr John A. Atkinson in compiling 'A Locality List of all the Minerals hitherto recorded from Victoria' (Atkinson 1896). This publication is a useful one, but its existence does not appear to be widely known.

In 1897 some fine crystal groups of crocoite (a rare lead chromate mineral) and cerussite from Dundas, Tasmania, and pyromorphite from Zeehan were donated by Mr James Mitchell, and a number of mineral specimens from overseas localities were purchased from Mitchell in 1897 and 1898. They included crystallized specimens of alexandrite, xenotime, descloizite, wulfenite, monazite, colemanite, boleite and other rare minerals. Mitchell was the Australian agent for Dr A. E. Foote, the mineral dealer of Philadelphia, U.S.A., and these minerals came originally from him. It is fortunate that they were purchased, as they include some particularly fine specimens and certain ones represent the only example of that mineral species in the Museum collection.

During the latter part of the nineteenth century, specimens of Victorian minerals and rocks were presented to the Museum from the Mines Department from time to time. Entries in old registers indicate that they came from the Mines Department Laboratory, and it is presumed that they include some of the interesting specimens submitted to the laboratory for identification and examination.

The Period 1899 to 1931

In 1899 Sir Frederick McCoy died and the Museum was moved from the University Grounds to the buildings occupied by the Public Library and the Industrial and Technological Museum in the city. Following this move the mineral and rock collections which had been housed in the Industrial and Technological Museum were transferred back to the National Museum, with Mr R. H. Walcott's part-time services. Walcott was designated Curator of the Geological and Ethnological Collections, a position he held on the National Museum staff until 1914. He made use of the Victorian mineral specimens in the Museum collection as well as the library facilities in compiling 'Additions and Corrections to the Census of Victorian Minerals' (Walcott 1900). This materially supplemented the list of Victorian minerals prepared by Atkinson (1896).

Professor Baldwin Spencer, the Museum Director from 1899 to 1928, was a noted biologist and anthropologist but was not greatly interested in geology. Nevertheless, during his term as Director there were some noteworthy acquisitions and the collections gradually increased in numbers and importance. Between 1900 and 1907 several purchases of outstanding and rare mineral specimens were made from James Mitchell, other individuals, and dealing firms. They included choice specimens from overseas countries as well as from Australian localities.

Unfortunately, on 10 January 1901, the Mineral Collection suffered a serious loss when the best gold specimens on display were stolen. This loss continued to be felt until the E. J. Dunn Collection of 625 gold specimens was purchased in 1948.

In 1905 a stony meteorite known as the Ellerslie meteorite was donated by

Mr Henry Crawford. This 22½ lb. meteorite had been found by Crawford five years previously on the Ellerslie Estate about 80 miles N. of Bourke, just across the Queensland border. A collection of gemstones and ornamental stones (both cut and uncut) was purchased from Mr F. Schafer of Melbourne in 1907. They were largely from Australian sources and included some beautiful cut tourmaline from Kangaroo Island, South Australia.

A giant crystal of selenite (a variety of gypsum) from the Mount Elliott Mine, S. of Cloncurry, Queensland, was received by donation in 1908 from the Directors of the Mine. This monoclinic crystal measures 30 inches in length and the crystal faces are 4½ inches wide. A crystal of this size is very rare indeed. Another outstanding donation made in 1908 was a large amethyst geode from Uruguay, South America. This magnificent specimen was presented by Mr L. F. Benjamin, a Melbourne jeweller, and has been admired by the public in the Mineral Gallery for many years. The first major purchase from an English dealer was made in 1908 when 70 mineral specimens from Great Britain and other European countries were bought from F. H. Butler of London.

An interesting collection of rocks from Antarctica obtained during the 'Discovery' National Antarctic Expedition in 1907 and 1908 was donated to the Museum in 1909. Two important purchases of minerals were also made in 1909. A collection of 100 minerals from overseas localities was purchased from Dr F. Krantz (a nephew of Dr A. Krantz) of Bonn, Germany, and a collection of 25 minerals was bought from the Foote Mineral Company of Philadelphia, U.S.A. Both collections contained rare species, and the prices for the individual specimens were quite reasonable, although £6 5s. 0d. was paid for a specimen of natrochalcite from Chile. Another purchase from Foote for a smaller number of specimens was made in 1910.

In 1911 a large block of magnetite containing 28 magnetite crystals was presented by the Chillagoe Railway and Mining Company. This outstanding specimen came from Mt. Lucy, S. of Chillagoe in North Queensland. Most of the crystals are dodecahedra and some are very large, ranging up to 5 inches in diameter. Two large and heavy specimens of ripple-marked sandstone (Grampians Group) were also donated in the same year. These specimens from near Woorndoo, Western Victoria, exhibit natural casts of ripples made by current action on the bottom of an extensive lake about 325 million years ago. Measuring approximately 4 feet × 2 feet × 5 inches each, one can imagine the difficulties experienced in bringing them to Melbourne.

The last purchase of specimens from Dr F. Krantz was made in 1912 when 95 rock specimens were bought, most of which were rare rock types not previously represented in the Collection. Another important addition made during 1912 was a collection of malachite and azurite specimens from Burra, South Australia. These were donated by Mrs Caroline Rigg, and included some particularly fine specimens that have helped to make the Museum collection very rich in Burra material.

In 1913 a nickel-iron meteorite which had been found in 1903 some 4 miles S. of Yarroweyah, Victoria, was purchased from Mr T. Holden for £6. This 21 lb. Yarroweyah meteorite, which had been discovered on Holden's farming property, is one of Victoria's few meteorites. It has been studied and described by Walcott (1915).

The growth of the collections was not very great during the 1914-1918 World War. However, the war stimulated prospecting in Australia for certain minerals, and some good specimens of wolframite, cassiterite, native bismuth, molybdenite and other economic minerals were donated to the Museum. In 1915 a collection of nearly 100 mineral specimens mainly from Australian localities was received as a donation from Reverend A. W. Creswell.

For a long time the lack of a full-time geologist on the staff, to care for the geological collections (other than fossils) had been felt. This situation was remedied in September 1919, when Mr P. B. Nye was appointed to carry out such duties, with the title of Petrologist. Nye was enthusiastic and, due to his personal efforts, there were some useful additions to the collections. Unfortunately, he resigned in 1920 and moved to Tasmania.

In 1919, the Museum purchased a collection of Australian auriferous minerals assembled by the late Mr G. H. Hone, at one time a mining valuer to the Commonwealth Taxation Department. Although the entire collection comprised only 32 specimens, they were a notable addition in that most were specimens of gold tellurides from Western Australia.

From 1920 to 1931 the most notable acquisitions were meteorites. In 1921 the 14 lb. Roper River meteorite which had been found by an aboriginal 50 miles from Urapunga, on the Roper River, Northern Territory, was presented by Mr T. Sayle of Whitfield, Victoria. In 1923 a 1¼ ton meteorite, discovered S. of Cranbourne, Victoria, was bought by the Victorian Mines Department and presented to the National Museum. Edwards and Baker (1944), who described the meteorite, recognized it as one of the Cranbourne meteorites and it has become known as the Cranbourne No. 4 meteorite. In 1926 the 9½ lb. Pevensey stony meteorite was purchased from Miss Ethel Godfrey for £10. It had been found in 1869 on Pevensey Station, about 12 miles S. of Hay, New South Wales.

In 1926 the Museum benefited from an exchange of mineral specimens with the Royal Ontario Museum, Canada. Specmiens of spencerite, ferrierite, ellsworthite and other rare minerals not previously in the Collection were received.

The Period 1931 to 1950

Mr D. J. Mahony, a petrologist on the staff of the Victorian Mines Department, was appointed Museum Director in 1931, holding the position until 1944. On Mahony's recommendation, Mr S. R. Mitchell, son of James Mitchell, was appointed Honorary Mineralogist in 1931. Mitchell was a metallurgist associated with various mining ventures in Australia, and a keen mineral collector who took advantage of every opportunity to secure specimens for the Museum and for his private collection. Mitchell paid frequent visits to the Museum from 1931 until his death in 1963, and over the years donated some hundreds of minerals and rocks to the Collections.

In 1932 the Museum acquired approximately 100 minerals and rocks which had been displayed in the Melbourne Aquarium, situated in the Exhibition Buildings. It is fortunate that they were secured, as the Aquarium was subsequently destroyed by fire. The collection contained 40 mineral specimens from the old Broken Hill Proprietary Mine at Broken Hill, New South Wales, and included some fine specimens of cerussite and embolite. Another notable acquisition in 1932 was a suite of minerals and rocks from the South Mine at Broken Hill, donated by Broken Hill South Limited.

Before 1933, owing to staff shortages, there were very few exchanges of specimens with other museums and mineral collectors. However, a valuable exchange was made in 1933 with the Australian Museum in Sydney. Choice specimens of molybdenite, wolframite and cassiterite from the New England district of New South Wales were received as well as sturtite and manganhedenbergite from Broken Hill. In 1934 a collection of 20 minerals and rocks from Western Australia was obtained through an exchange with Dr E. S. Simpson of the Western Australian Government Chemical Laboratories. Simpson was an outstanding mineralogist, and information concerning several minerals that he sent to the National Museum had previously been recorded by him in scientific journals. They

included palygorskite, amblygonite, cummingtonite, margarite, gedrite, lithiophilite and rosterite, some of which were not represented in the Collection.

Gradually over the years the number of australites in the Collection had been increasing. On his expeditions to Central Australia, Baldwin Spencer had obtained some from Charlotte Waters and other places. In 1935, however, the size of the Australite Collection increased considerably when 330 specimens from Mulka, South Australia, were purchased from Mr George Aiston, a protector of aborigines at Mulka. These and other Mulka australites have been examined recently by Baker (1969).

The growth of the Collections was retarded during the Second World War, but there were some important acquisitions. One was a stony meteorite found by Mr S. McEachern near Caroline, South Australia. Stillwell (1941) has described it, naming it the Caroline meteorite. In December 1941, a small piece of the famous 'Welcome Stranger' gold nugget (the largest nugget found in the world) was donated by Mrs J. A. Deason. This nugget was discovered by John Deason and Richard Oates at Moliagul, Victoria, in 1869. The donated specimen had been kept in the Deason family for many years, and is reputed to be the last remaining piece of the nugget. In May 1942, forty overseas mineral specimens were received by donation from the Prahran City Council, Victoria. Originally they had been purchased from Foote, the dealer of Philadelphia, U.S.A. The Koraleigh stony meteorite, described by Edwards and Baker (1943), was donated by Mr F. A. Cudmore, in 1943. Cudmore found the meteorite near Koraleigh, N.S.W., about 20 miles NW. of Swan Hill. As fewer than 2,200 meteorites have been found in the world, a meteorite donation is important.

In 1944 Mr R. T. M. Pescott was appointed Museum Director, and it was largely through his efforts that Mrs Sylvia Whincup was appointed to the position of mineralogist in 1946. After she joined the staff the Collections grew more rapidly, and a start was made to arrange the Mineral Reference Collection systematically according to the Dana Classification.

In August 1946 the O. R. Rule Collection of more than 650 mineral specimens was purchased for £275. Mr O. R. Rule had been a member of the Industrial and Technological Museum staff, and had looked after the Geological Collection from 1872 to 1892. His personal collection consisted largely of overseas minerals bought from Krantz and Foote and contained many less common minerals which are valuable for reference and research purposes. The collection also contained many beautiful polished agates from India and South America, some of which are now on exhibition.

Mrs Whincup was interested in gemmology, and realized that there was a need to set up attractive displays of gemstones and ornamental stones. As the Museum had very little precious opal the Trustees purchased a valuable collection of Australian opal from N. H. Seward in 1947. This included specimens of boulder opal from Southern Queensland, rough and cut stones from New South Wales, and some good quality cutting opal from Coober Pedy and Andamooka in South Australia.

In May 1947 a 37½ lb. piece of the Henbury nickel-iron meteorite was purchased for £12 3s. 9d. from Mrs W. Gill of Camberwell, Victoria. This large fragment had been found adjacent to one of the Henbury meteorite craters about 70 miles SW. of Alice Springs, Northern Territory. It is by far the largest piece of Henbury meteorite in the Museum collection.

Late in 1947 a large polished slab of orbicular granite from Karamea, New Zealand, was received as a donation from the Government of New Zealand. This very rare variety of granite contains 'orbs' or spheroids consisting of alternating

concentric zones of black mica (biotite) and white oligoclase feldspar embedded in a matrix of normal granite.

The Museum benefited considerably by exchanges with Dr E. L. Calvert and Mr E. Beach, two Californian mineral collectors, in 1948; choice specimens of bakerite, colemanite, hureaulite, priceite, benitoite, neptunite, diaboleite, meyerhofferite, crestmoreite, gillespite, sanbornite, descloizite and certain other rare minerals from U.S.A. and Mexico were received. Most of these mineral species were not previously represented in the Museum collection.

In May 1948 the J. Hornsby Collection of 385 mineral and rock specimens was donated by his daughter, Mrs J. A. C. Firth of Geelong. Mr Hornsby had been associated with gold mining in the Maldon district of Victoria as early as 1872, and the collection was particularly rich in minerals from that area. It also contained many fine specimens from Broken Hill and other localities in Australia and overseas countries.

The most important acquisition received during 1948 was the E. J. Dunn Collection of minerals and rocks. Mr E. J. Dunn (1844-1937) was a pioneer geologist in Australia and South Africa who built up a large private collection. He joined the Geological Survey of Victoria in 1864 and was its Director from 1904 to 1912. Part of the E. J. Dunn Collection was purchased from his daughter, Miss Lilian P. Dunn, for the sum of £785. The remaining part was donated by Miss Dunn and other members of the Dunn family. The purchased part consisted of 625 gold specimens from Australian, South African and New Zealand localities, and 67 uncut diamonds from the Kimberley mines in South Africa. The gold collection illustrates well the different forms and modes of occurrence of native gold and includes some beautiful gold crystals. Many of the specimens are of great historical value, as they were used for the illustrations in Dunn's book, *The Geology of Gold,* published in 1929. Owing to the working-out of most of the mines, the gold specimens are now largely irreplaceable. The collection of diamonds shows the variation of crystal form and colour that may occur, as well as the various classes of gem and industrial stones. The donated section of the Collection consisted of more than 1,500 specimens from Australia and overseas countries and included such rare minerals as stichtite, enhydros and awaruite.

The policy of exchanging certain duplicate material with selected private collectors was continued in 1948 when a useful exchange was made with the Reverend A. E. Gardner of Canberra Grammar School. Exchanges of mineral specimens with this secondary school teacher have continued to the present time and many fine specimens have been donated by him.

The Period 1950 to 1969

Mrs S. G. Whincup resigned early in 1950 and Dr A. W. Beasley, a graduate of the Universities of Queensland and London, was appointed to the position of mineralogist, commencing duty in July of that year.

Late in 1950 the Museum purchased an interesting collection of gemstones from the estate of W. F. Petterd, author of the Tasmanian Mines Department publication 'Catalogue of the Minerals of Tasmania' (1910). The collection included diamonds from Inverell and Bingara in New South Wales, emerald crystals from Emmaville (N.S.W.) and faceted sapphires and topaz from Tasmania and Queensland. Most of the uncut and cut specimens were from Australian localities.

As a token of their gratitude for assistance rendered during an expedition to Australia, the Denver Museum of Natural History in Colorado, U.S.A., donated in 1951 a valuable and historic collection of gold specimens to the Museum. This was a portion of their John Campion Collection, and consisted largely of crystalline, leaf and wire gold from the famous Wapiti Gold Mine, Farncomb Hill,

Colorado. The total weight of gold in the donation was 15 ounces. Most of the specimens are of great beauty as well as being of scientific interest because of their rare form.

Another noteworthy acquisition received during 1951 included specimens of the rare minerals marshite from Broken Hill and chillagite from Chillagoe, Queensland. They were acquired through an exchange with Dr L. J. Lawrence of the University of New South Wales.

Dr C. M. Focken was appointed Director of the Museum (now Institute) of Applied Science of Victoria in 1951, and he soon sought the assistance of Dr Beasley in an examination of that Museum's collection of economic minerals and rocks stored in their basement area. This work resulted in the transfer of 358 mineral and 149 rock specimens to the National Museum.

A collection of minerals from Arizona, U.S.A., was received in 1953 through an exchange with Dr A. L. Flagg of the Arizona Bureau of Mineral Resources; it included choice specimens of carnotite, dioptase, wulfenite and vanadinite as well as the rare copper silicates shattuckite and bisbeeite which were not formerly represented in the Museum collection. A suite of minerals from the Northern Territory, including uranium minerals from Rum Jungle, was acquired by exchange in the same year from the Commonwealth Bureau of Mineral Resources, Geology and Geophysics.

As the result of a collecting expedition organized by Mr E. D. Gill (National Museum) and Dr G. Baker (CSIRO), 366 australites were added to the Museum collection early in 1953. Most were found in the Childers Cove-Stanhope Bay region, SE. of Warrnambool in Western Victoria; they were subsequently described by Baker (1956).

During 1954 Dr George Baker of the CSIRO Mineragraphic Section, University of Melbourne, made two valuable donations. One was a collection of sand stalagmites which he had described (Baker 1942) from caves in Loch Ard Gorge near Port Campbell, Victoria, and the other a collection of pisoliths, ooliths and other calcareous growths from limestone caves at Port Campbell, studied by Baker and Frostick (1951). Baker also donated pisoliths from Angel Cave, Cape Schanck, Victoria, and from the North Broken Hill Mine which had been described in an earlier paper (Baker and Frostick 1947).

In response to a request for specimens to incorporate in exhibits dealing with Australian lead and zinc minerals, Zinc Corporation Limited donated a suite of spectacular specimens from their Broken Hill mine in 1954. Another notable donation in the same year was a collection of 70 Australian minerals from the estate of Mr Charles Hill of Hawthorn, Victoria. It included specimens of torbernite, antunite and other uranium minerals from Mount Painter, South Australia.

The Museum benefited at about this time from exchanges with the Hobart Museum and the American Museum of Natural History. Good specimens of anglesite, stichtite, stannite, magnetite and dolomite were received from Tasmania and a number of rare minerals from America.

The first of a series of donations of overseas minerals and rocks from Mr A. J. Magri, a keen private collector of Kilsyth, Victoria, was received in 1955. These donations have continued to the present time and have helped to fill various gaps in the Collections.

In October 1955 an offer to purchase the mineral collection of Mrs P. James of Abbotsford, Victoria, for the sum of £16 16s. 0d. was accepted. The specimens had originally come from the private collection of Mr S. R. Mitchell and consisted mainly of economic minerals. A specimen of the rare mineral willyamite (a variety of ullmannite) from Broken Hill was a particularly welcome acquisition.

For a number of years Mrs Kathleen Woodburn, a well-known naturalist and

writer, had been seeking help and advice from the Museum and making donations of specimens. Mrs Woodburn was a keen collector and, following her death in 1955, her geological collection was donated to the Museum. It included approximately 285 mineral and 90 rock specimens, being particularly rich in material from the Northern Territory.

Following earlier research on Queensland heavy mineral beach sands, Dr Beasley made a study of heavy black sands on Phillip Island, Victoria (Beasley 1957). This resulted in a suite of Phillip Island sand samples and microscope slides of heavy mineral fractions being added to the Collection.

In 1956 Dr George Baker was appointed Honorary Associate in Mineralogy. He was well known for his research on australites (Australian tektites), and it was largely through this work that the Australite Collection had gradually been increasing. An interesting collection of australites from the Cavendish district, Victoria, was donated by Mr E. V. Lewis of Cavendish in 1956. In the same year a further collection of australites from the Childers Cove-Stanhope Bay region, SE. of Warrnambool, came to the Museum. They were found by Mr Brian Mansbridge and Mr Colin Drake, two keen young collectors who lived near Warrnambool; it brought the number of australite specimens found by them in that region and presented to the Museum between 1954 and 1957 to a total of 326. Another notable acquisition was a suite of Philippine Islands tektites donated by Dr H. O. Beyer of Manila.

Australian mining companies continued to donate economic minerals to the Museum, particularly when specimens were requested for display purposes. One such donation in 1956 was a collection of manganese ores and other minerals from Western Australia, presented by Westralian Ores Pty. Ltd. of Perth.

Many ministers of religion are interested in geology, and some have private collections. One such person was the Reverend E. H. Chapple of Melbourne who had been appointed Honorary Conchologist in 1933. His collection, consisting mainly of Australian rocks, was presented to the Museum in 1956 following his death.

Pieces of three stony meteorites from U.S.A. were donated by Dr George Baker in 1957. They were the Plainview meteorite from Texas and the Alamogordo and Pasamonte meteorites from New Mexico. Another donation in the same year was a collection of minerals and rocks from the estate of the late W. H. Ferguson of East Camberwell, Victoria. Mr Ferguson had been a geologist with the Geological Survey of Victoria, and most of the specimens were from Victoria and other Australian states.

The most important acquisition in 1958 was the G. B. Pritchard Collection which was purchased from his widow for the nominal sum of £50. Dr G. B. Pritchard was a well-known geologist who for many years had been Lecturer in Geology at the Working Men's College (now called the Royal Melbourne Institute of Technology). The collection was a particularly comprehensive one, comprising 1,019 mineral and 271 rock specimens from many different parts of the world. Another valuable acquisition in 1958 was a collection of 32 gemstones including polished Coober Pedy and Lightning Ridge opals from Mr G. Schlemme of Melbourne.

As early as 1907 Mr Felix Westwood of Footscray, Victoria, had donated specimens of gypsum from near the Kensington Railway Station, and further donations of minerals from other Melbourne suburbs were made in subsequent years. Following his death in 1959, Westwood's collection of 420 mineral specimens was presented to the Museum by his niece. It consisted mainly of secondary carbonate and zeolite minerals from the old basalt quarries at Footscray and Collingwood and included some particularly fine specimens of acicular aragonite.

purchased after Mr Mitchell's death for the sum of £250. The Collection comprised nearly 2,000 mineral specimens, 60 rocks, 45 tektites and fragments of two meteorites (the Henbury and the Canyon Diablo). It contained native gold, diamonds, precious opal and specimens of many other minerals from Australia and overseas, some of which can no longer be obtained.

As the result of a systematic search for australites at Port Campbell, Victoria, organized by Mr E. D. Gill of the National Museum, a specimen of special interest was added to the Collection early in 1964. This was an excavated block of compact soil (humus podsol) containing an australite *in situ*; the australite occurred at a depth of 12 inches below the surface of the ground (Gill 1965). At the same time, a number of australite specimens found at Port Campbell by members of the search party were added to the Collection.

Specimens of hematite-quartzite, hematite and other iron ores from the Hamersley Range in Western Australia were donated by Enterprise Exploration Limited in 1964. Another acquisition in the same year was the Corowa nickel-iron meteorite, described by Baker, Gittins and Donnelly (1964). It had been discovered during the ploughing of a wheatfield approximately 4 miles from Corowa, N.S.W., and was presented by the property owner, Mr D. McGillivray. This meteorite belongs to a rare class known as a nickel-rich ataxite and is the only representative of its kind in the Museum Collection.

The Australian Institute of Aboriginal Studies in Canberra gave 60 australites from Mulka, South Australia, as well as 79 from other localities, to the Museum in 1964. Originally they were part of the S. R. Mitchell Collection of geological specimens and the Mulka australites had been studied by Baker (1969), but they had been wrongly included in the S. R. Mitchell Anthropological Collection purchased by the Institute. Through an exchange with the South Australian Museum in June 1964 a 7½ oz. piece of the Coonana stony meteorite was acquired. This 15 lb. meteorite had been found 3½ miles W. of the Coonana bore, E. of Lake Callabonna, South Australia, in 1962.

An exchange with Mr Joseph Urban of Tucson, Arizona, in 1965 resulted in the acquisition of several overseas minerals not previously represented in the Collection. These included gowerite, nobleite, beegerite, strunzite, laueite, ajoite and kornelite. In May of the same year a large specimen of inesite from Broken Hill was donated by Mr A. H. Chapman, the well-known Sydney collector, and a number of choice mineral specimens from overseas localities were acquired from him through an exchange.

Dr D. R. Chapman of the United States National Aeronautics and Space Administration donated representative collections of tektites from South Vietnam and Thailand in 1965, in appreciation of help given in his researches on australites. These donations considerably increased the Museum's collection of overseas tektites. Another noteworthy acquisition during 1965 was a suite of metamorphic rocks mostly from the NW. part of South Australia; they were donated by Mr J. E. Johnson of the South Australian Department of Mines.

The Wolf Creek meteorite crater in Western Australia, the world's second largest, was discovered in 1947 but it was not until 1965 that fragments of an iron meteorite were found near the crater. One of these fragments was donated by Professor S. R. Taylor of the Australian National University who described the material collected (Taylor 1965).

Dr F. H. Pough of the Santa Barbara Museum of Natural History in California visited the National Museum in 1965, and specimens of chambersite, danburite, eskolaite, milarite, simpsonite and tourmaline were obtained through an exchange with him. A further exchange was made in 1966 when idocrase crystals, crystallized rose quartz, witherite, clinoclase and other interesting minerals were received.

In October 1959 a small piece of fulgurite, found at Karnak in Western Victoria, was submitted for identification. This resulted in the excavation of a fulgurite approximately 5 feet long from a sandhill at Karnak and its presentation to the Museum by Mr H. A. Keys. Beasley (1964) has studied and described this unusual specimen, formed by a lightning discharge penetrating a sandhill and melting the quartz sand along its path.

Broken Hill Proprietary Ltd. made a worthwhile donation in 1960 when they presented part of their collection from the old Proprietary Mine at Broken Hill. It contained good specimens of embolite, marshite, iodyrite, stolzite, raspite and other rare secondary minerals. Another collection given to the Museum in 1960 was that of Mr T. S. Hart (1871-1960), a teacher and naturalist who for many years was Lecturer in Geology at the Ballarat School of Mines. An accompanying hand-written catalogue gave the locality for each of several hundred specimens, almost entirely from Victoria. The Museum benefited from exchanges with Mr D. L. Erling of Milwaukee, U.S.A., between 1960 and 1964, receiving choice specimens of North American, Scandinavian and Madagascar minerals including new and rare species which filled several gaps in the Collection.

For some time Dr G. Baker had been studying accretionary growths found in sediments outcropping along the S. coast of Western Victoria between Freetrader Point (SE. of Princetown) and a point several miles NW. of Peterborough. On completion of his research in 1960 on a very wide range of accretionary growth structures, he donated the material studied (Baker 1962) to the Museum.

An exchange with the United States National Museum (Smithsonian Institution) in 1961 resulted in a representative collection of tektites from the Philippine Islands coming to the Museum. In the same year pieces of three Argentine meteorites were donated by Dr G. Baker. They were the Vera, El Toba and San Carlos meteorites, none of which were previously represented in the Collection.

A number of Broken Hill mining men have built up extensive mineral collections from the mines there, one of the most outstanding being that of Mr A. R. Campbell. Following suggestions from his friend, Sir Maurice Mawby, in 1962 Campbell donated a number of his minerals including crystallized specimens of stolzite, raspite, bustamite, campylite and brochantite. Another valuable donation in the same year was a miscellaneous collection of minerals and rocks from Mr F. S. Colliver, the well-known naturalist, which included several specimens of unusually large size and special interest. Late in 1962 one hundred and fifty australites which constituted part of the ethnological collection of the late Mr H. R. Balfour of Melbourne were received. These australites, from Mulka in South Australia, were subsequently studied by Baker (1969).

Between 1957 and 1963 Dr Beasley contributed to an ecological survey of Port Phillip Bay by studying the bottom sediments (Beasley 1966). This research resulted in several hundred samples of bottom sediments being classified and added to the Collection. Sand fractions of these samples are at present being loaned to specialists who are studying the foraminifera and ostracoda in them.

A marked increase in the number of Canadian minerals in the Collection came through an exchange with the Geological Survey of Canada in 1963. Among the minerals received was a specimen of the new species niocalite from Oka in Quebec. Another important acquisition in 1963 was a collection of minerals from Mount Painter and other areas in South Australia. This was donated by Mr B. Flounders of Whyalla and included some outstanding specimens of crystallized gypsum from the Kimba Gap and Myall Creek areas near Whyalla. Because of their fragile nature some of the gypsum specimens were hand-carried to Melbourne by Mr M. J. Mooney of the Museum Mineralogy staff who assisted in collecting them.

The most important acquisition in 1963 was the S. R. Mitchell Collection,

Dr Pough was previously Curator of Minerals at the American Museum of Natural History in New York, and the quality of his specimens was outstanding. Another valuable acquisition in 1966 was a collection of metamorphic rocks from Finland, donated by Professor Kalervo Rankama of the University of Helsinki.

The largest individual donation during 1966 was a collection of 148 australites which had been found 16 miles NNE. of Morgan in South Australia. These specimens came from Mrs Doris Thamm of Morgan and have been described by Baker (1968b). The growing public interest in australites was reflected in two further important donations during 1966. One was a collection of australites from 6 miles N. of Princetown in Victoria, presented by Mr E. Franks of Coburg, Victoria, and described by Baker (1968a). The other was a collection from near Bulong in Western Australia, donated by Mr C. B. C. Jones of Hampton Hill, near Kalgoorlie.

During 1966 the Museum collection benefited through donations from and exchanges with Mr A. F. Eadie of the Eadie Mining Engineering Company in Taft, California. Large individual crystals of bloedite as well as thenardite crystal groups from the Soda Lake region in California, and specimens of the new minerals deerite, howieite and zussmanite from northern California, were received.

Between 1966 and 1968 Dr Beasley carried out an investigation of the beach sands on the southern shore of Port Phillip Bay, Victoria (Beasley 1969). This research resulted in 23 beach sand samples, of which the textural and constituent composition had been described, being added to the Collection.

The most valuable acquisition during 1967 was a collection of rare minerals and gemstones obtained through an exchange with Mr M. L. Ehrmann, a mineralogist of Los Angeles, California. Particularly choice specimens of brazilianite and kunzite from Brazil were received. Another rare mineral known as doverite was donated by Professor A. J. Boucot of the California Institute of Technology in 1967; it came from Dover in New Jersey, U.S.A.

Early in 1968 a giant spherulite, with a diameter of 12 inches, from Doon Doon, N.S.W., was donated by Mr N. Franks of Albury. It is by far the largest spherulite in the Collection. The growing interest in meteorites throughout the world resulted in requests from various universities and research organizations for samples of them. Several requests came from Professor R. A. Binns of the University of New England in Armidale and, in appreciation of assistance given, he donated pieces of two Queensland meteorites in 1968. They were the Hamilton meteorite and the Wynella meteorite, neither of which were previously represented in the Collection.

A suite of nickel-bearing mineral specimens and the rocks associated with them from Kambalda in Western Australia was presented by Western Mining Corporation Limited in 1968, and further specimens from the same region were donated by Mr R. H. Gill of Melbourne. An outstanding specimen received during the same year was a large hexagonal crystal of aquamarine from Brazil. This beautiful crystal measuring 3 inches in height was obtained from Dr P. Bancroft of Livermore, California, U.S.A.

Gold crystals are rare, so the acquisition of a specimen containing four large crystals associated with limonite was of particular importance. This unique specimen had been found during the early days of gold mining in Victoria, and is thought to have come from the Wedderburn field. It was offered for sale to the Museum by Mr Frank Mitchell (son of the late S. R. Mitchell) and purchased for $14, but its value as a specimen is many times this sum.

The growth of interest in gemmology and lapidary was reflected in an increase in donations of gem minerals and ornamental stones. In 1968 Altmann and Cherny Pty. Ltd. of Melbourne donated a collection of gemstones which included

a particularly fine yellow cut sapphire from Ceylon. Another valuable donation in the same year came from Dr H. E. Millson of New Jersey, U.S.A.; it consisted of polished agates from Mexico, 'agatized coral' (chalcedony and agate replacing fossil coral) from Florida, and polished labradorite from Labrador. Cut and polished spherulites containing agate and chalcedony from Tamborine Mountain and Mount Hay in Queensland were also donated by lapidary enthusiasts anxious to help the Museum. During 1969 a faceted rock crystal (weight 86 carats) from Kingsgate, N.S.W., and a large faceted smoky quartz from Beechworth, Victoria, were presented by Mr A. Amess of Melbourne who cut and polished the specimens.

Conclusions

The most extensive collection of overseas minerals and rocks in an Australian museum has been assembled during the past 115 years. Efforts to build up the collections of Australian minerals and rocks during the past 20 years have resulted in considerable additions, but continued endeavour is needed to further enlarge them.

Service given by the staff and honorary associates has influenced many individuals, companies, and teaching and research organizations in presenting specimens to the Museum. Exchanges of certain duplicate material with other museums, universities and private individuals are valuable; gaps in the Collections may be filled and good specimens obtained. However, as the number of specimens available for exchange is limited, more purchases will be necessary in the future to acquire rare minerals and choice specimens from overseas countries.

During the 115-year period of growth of the Collection there have been some marked changes of interest in various minerals and in meteorites and tektites. During the nineteen fifties the number of uranium-bearing minerals in the Collection increased considerably following the advent of atomic energy and the search for uranium deposits. The importance of tektites in planetary science during the past 10 years has resulted in many more tektites being donated to the Museum than in previous decades.

As the Collections have grown they have been arranged more systematically, allowing greater use to be made of them. This applies to the part on display and to the reserve collections which are available for reference and research purposes. Series of teaching exhibits set up in recent years are used extensively by students, and other exhibits are attracting greater public interest. A larger number of specimens have been loaned to universities and other research organizations during the past 10 years than in previous decades, and research work on Museum specimens has added to scientific knowledge at an increased rate.

References

ATKINSON, J. A., 1896. A locality list of all the minerals hitherto recorded from Victoria. *Proc. Roy. Soc. Vict.* 9: 68-119.

BAKER, G., 1942. Sand stalagmites. *J. Geol.* 50: 662-667.

————, and FROSTICK, A. C., 1947. Pisoliths and ooliths from some Australian caves and mines. *J. sedim. Petrol.* 17: 39-67.

————, ————, 1951. Pisoliths, ooliths and calcareous growths in limestone caves at Port Campbell, Victoria. *J. sedim. Petrol.* 21: 85-104.

————, 1956. Nirranda strewnfield australites, south-east of Warrnambool, Western Victoria. *Mem. nat. Mus. Vict.* 20: 59-172.

————, 1962. Accretionary growth structures, south-west Victorian coast, Australia. *Mem. nat. Mus. Vict.* 25: 17-48.

————, GITTINS, A., and DONNELLY, T. H., 1964. Nickel-rich ataxite from Corowa, New South Wales. *Geochim. et Cosmochim. Acta.* 28: 1377-1388.

————, 1968a. Australites from Princetown, Victoria. *Mem. nat. Mus. Vict.* 28: 23-37.

————, 1968b. Australites from NNE. of Morgan, South Australia. *Mem. nat. Mus. Vict.* 28: 39-76.

———, 1969. Australites from Mulka, Lake Eyre Region, South Australia. *Mem. nat. Mus. Vict.* 29: 65-79.

Beasley, A. W., 1957. Heavy black sands from Phillip Island, Victoria. *Mem. nat. Mus. Vict.* 21: 101-116.

———, 1964. A fulgurite from Karnak, Western Victoria. *Mem. nat. Mus. Vict.* 26: 11-19.

———, 1966. Bottom sediments of Port Phillip Bay. *Mem. nat. Mus. Vict.* 27: 69-105.

———, 1969. Beach sands of the southern shore of Port Phillip Bay, Victoria, Australia. *Mem. nat. Mus. Vict.* 29: 1-21.

Chalmers, R. O., 1967. *Australian rocks, minerals and gemstones.* Angus & Robertson, Sydney.

Dunn, E. J., 1929. *Geology of gold.* Griffin, London.

Edwards, A. B., and Baker, G., 1943. The Koraleigh stony meteorite. *Mem. nat. Mus. Vict.* 13: 157-160.

———, ———, 1944. The Cranbourne meteorites. *Mem. nat. Mus. Vict.* 14: 23-35.

Gill, E. D., 1965. Quaternary geology, radiocarbon datings and the age of australites. *Spec. Pap. geol. Soc. Am.* 84: 416-432.

Liversidge, A., 1875. The minerals of New South Wales. *Trans. Roy. Soc. N.S. Wales* 9: 153-215.

Pescott, R. T. M., 1954. *Collections of a century.* Brown, Prior, Anderson, Melbourne.

Petterd, W. F., 1910. *Catalogue of the minerals of Tasmania.* Gov. Printer, Hobart.

Selwyn, A. R. C., and Ulrich, G. H. F., 1867. Notes on the physical geography, geology and mineralogy of Victoria. *Official Record of Intercolonial Exhibition of Australasia, Melbourne, 1866-67*: 145-236.

———, and others, 1868. *A descriptive catalogue of the rock specimens and minerals in the National Museum, collected by the Geological Survey of Victoria.* Gov. Printer, Melbourne.

Stillwell, F. L., 1941. The Caroline stony meteorite. *Mem. nat. Mus. Vict.* 12: 41-48.

Taylor, S. R., 1965. The Wolf Creek iron meteorite. *Nature, Lond.* 208: 944-945.

Ulrich, G. H. F., 1869. Observations on the 'Nuggety Reef', Mount Tarrengower gold-field. *Q. Jl. geol. Soc. Lond.* 25: 326-335.

———, 1870. *Contributions to the mineralogy of Victoria.* Gov. Printer, Melbourne.

Walcott, R. H., 1900. Additions and corrections to the census of Victorian minerals. *Proc. Roy. Soc. Vict.* 13: 253-272.

———, 1915. Description of the Victorian meteorites, with notes on obsidianites. *Mem. nat. Mus. Vict.* 6: 1-66.

MIOCENE PENGUINS FROM VICTORIA, AUSTRALIA, AND CHUBUT, ARGENTINA

By George Gaylord Simpson

Summary

Pseudaptenodytes, new genus, its type-species *P. macraei,* new, and questionably referred species ? *P. minor,* new, are described from the Cheltenhamian, late Miocene, of Victoria, Australia. *Chubutodyptes,* new genus, and its type-species *C. biloculata,* new, are described from the Patagonian, early Miocene, of Chubut, Argentina. All are referred to the extant penguin family Spheniscidae. They increase knowledge of the Miocene expansion of the family but cast no new light on its origin or on ancestry of the living species.

Introduction

Only six fossil penguin bones have hitherto been described from Australia (Simpson 1957, 1959, 1965), and only one of those, unidentifiable to genus, was from the late Miocene. Recent curating of the collections of the National Museum of Victoria by Mr H. E. Wilkinson brought to light ten more specimens, all from the late Miocene, acquired at intervals since about 1888 from the following collectors: A. N. Carter, F. A. Cudmore, W. B. Jennings, and G. B. Pritchard. Nine further specimens from his personal collection were added by Mr Colin Macrae, and another was submitted by Mr W. Ridland as this study was being completed. It was at first hoped that Professor B. J. Marples, formerly of Otago University, Dunedin, New Zealand, well known for his studies of Tertiary penguins from New Zealand and Seymour Island, would undertake the study. Unfortunately his retirement and departure from New Zealand made that impractical. Mr Wilkinson then very kindly offered the collection to me for study and forwarded it to me in the first instance at the Otago Museum, Dunedin, for first-hand comparison with most of Professor Marples' New Zealand specimens. The identifiable Australian specimens were found to be quite distinct from known New Zealand species, and study was continued and completed in the United States.

In the course of comparison with fossil penguins from Patagonia preserved in the American Museum of Natural History, attention was particularly drawn to two conspecific specimens previously recognized as distinctive but left unnamed (Simpson 1946). These seem clearly to represent an otherwise unknown genus and species, and no further, better specimens having turned up it was decided that convenience requires their being named at this time. They are therefore included in this paper, in connection with which they were again brought under study.

In the following, AMNH stands for the American Museum of Natural History, CM for the collection of Colin Macrae, and NMV for the National Museum of Victoria.

Australian Specimens

Materials, Sites and Age: Twenty specimens are at hand, ten from older NMV collections, nine from CM, and one from W. Ridland. Eight of these, although spheniscid, are not more exactly identifiable and do not seem to provide information of any particular interest. The other twelve specimens are the subjects of this study. Most, including the unidentified specimens, are similarly preserved. With one exception they are broken bones, badly abraded so that some and in certain of them most of the surface detail has been ground or polished away.

With another exception, all, including those not identifiable, were found at or near Beaumaris, Victoria. Only one was definitely found *in situ*, but it is probable that all of those from Beaumaris were originally buried in the type Cheltenhamian. This stage is near the Miocene-Pliocene boundary. On evidence reviewed by Wilkins (1963) most students now refer it to the late Miocene (for example, Brown, Campbell, and Crook 1968), although there is some disagreement (for example, Stirton, Tedford, and Woodburne 1968).

The single but important exception as to place of origin is NMV P26668, made the holotype of a type species in this paper. Its original label, written in 1916, gives the source as 'Formation Tertiary (Kalimnan). Locality Spring Creek nr Minhamite'. The Kalimnan is now generally referred to the Pliocene. However, it now appears that the exposures at the Spring Creek locality (about 25 miles SE. of Hamilton, Victoria) from which the penguin came are not of that age. Mr Thomas A. Darragh, Curator of Fossils in the National Museum of Victoria, has kindly supplied the following comments (letter of 2 July 1969): 'The actual locality is a small outcrop in Spring Creek, Spring Creek Station, about ¼ mile NE. of the homestead. The grid reference is Hawkesdale 368 129 on the 1:63,630 military sheet. The age of the deposit is still in some doubt. Mr Gill [Gill 1964, p. 332, see references at end of this paper] has published . . . an Upper Cheltenham age which I gave him in 1963 when I first looked at this fauna. Since then I have looked at more material and also have a better idea of our molluscan faunas so that I am not certain that this is correct. There is no evidence that it should be Upper Cheltenhamian, in fact I doubt if one could distinguish an upper or lower Cheltenhamian anywhere. I am still inclined to think that because of the presence of *Aturia australis* at Minhamite it should be correlated with the Beaumaris fauna and placed in the Upper Miocene but new evidence recently to hand from New Zealand suggests that perhaps we should not place too much emphasis on the presence of *Aturia*. The forams at Beaumaris tend to give a latest Miocene age but could possibly be earliest Pliocene. The foraminiferal fauna from Spring Creek has not yet been examined. There is a possibility that the Spring Creek mollusc fauna is a shallow water assemblage of late Middle Miocene or early Upper Miocene age, i.e., late Bairnsdalian to Mitchellian on the Victorian scale but until we know more about the molluscs I think my original determination of Cheltenhamian can stand. Certainly it is not younger than Cheltenhamian on our present state of knowledge.'

It thus appears that the original labelling of the Spring Creek specimen as Kalimnan was incorrect and that it is probably Cheltenhamian but possibly somewhat older. Unless and until contradictory evidence appears, it may be considered as of approximately the same age as the Beaumaris specimens.

The condition of the specimens does not permit taking consistent standard measurements, as, for instance, in Simpson (1946) or Marples (1952), but the approximate sizes are indicated by comparison with Recent species, and non-standard dimensions can be taken from the illustrations.

Family Spheniscidae

Genus **Pseudaptenodytes,** new

Etymology: *Pseud-*, false, *Aptenodytes*, a Recent genus of penguins with a humerus that seems at first sight like that of the fossil but is seen on closer study to be distinct.

Type Species: *Pseudaptenodytes macraei, infra.*

Known Distribution: Cheltenhamian Stage of Victoria, Australia.

DIAGNOSIS: Humerus with large bicipital fossa, strongly double, inner or accessory subdivision much smaller than outer or main part, with restricted, oval aperture, but very deep. Shaft stout, sigmoid, expanding distally, preaxial angulation probably present but rounded.

DESCRIPTION: The type species, and hence essentially the genus, is based on the most clearly distinctive of the specimens available, all of which are poorly preserved. Most of the available specimens are referred with greater probability to a second species, which is only doubtfully congeneric with the type species. If not congeneric, the species do appear to be closely related, and brief generic description involves both. Undue confusion cannot arise as the specimens involved are specified.

NMV P26668, a partial humerus, type of *P. macraei,* is close to the Recent species *Aptenodytes patagonicus* in size and similar in general structure, but on detailed comparison differences other than in size are found to be greater than between any two Recent genera of Spheniscidae. Most striking is the fact that the internal division of the tricipital fossa, similar in distinctness and depth, is notably smaller in volume in *Pseudaptenodytes* and has a likewise smaller and more simply oval aperture. This is, indeed, a marked difference from any other penguin, fossil or Recent, known to me with the probable exception of the other species, ? *P. minor,* tentatively referred to *Pseudaptenodytes.* NMV P26671, referred to the latter species and the only other Cheltenhamian specimen in hand that preserves this feature, shows it imperfectly. It is strongly abraded in this part, but does clearly show that the inner fossa was small, deep, with an oval aperture, quite as in NMV P26668. In view of the poor preservation, it is not certain that NMV P26671 is not in fact referable to *P. macraei,* but it seems to have the more slender shaft of ? *P. minor.*

Aside from the tricipital fossa, the whole proximal part of NMV P26668 is almost identical with that of *A. patagonicus.* The shaft, however, is distinctly wider and more sigmoid, and it broadens more distinctly distally. Although the region of the preaxial angulation is abraded, it appears that the angulation was slight, probably no more than in *A. patagonicus* and perhaps even less. NMV P26669, type humerus of ? *P. minor,* is less abraded in this region and the angulation as preserved is slight, distinctly less than in *Aptenodytes* or any other Recent penguin compared. The shaft is considerably more slender than in NMV P26668, less sigmoid, and less, but somewhat, expanded distally. I take these to be probable specific characters. The distal end (not preserved in NMV P26668) is more compressed, or less expanded, laterally than in Recent penguins. As preserved, this specimen is closely similar to early Miocene humeri from Patagonia referred to *Palaeospheniscus robustus,* for example, AMNH 3361, both in size and in structure, although the preaxial angulation is less marked and the shaft is somewhat longer. However, on NMV P26671, as previously described, the tricipital fossa is quite different from that of *Palaeospheniscus robustus.* If, as is reasonably probable, NMV P26669 is congeneric or, *a fortiori,* conspecific with NMV P26671, neither one can belong to *Palaeospheniscus.*

As far as they go, other partial humeri referred to ? *P. minor* agree closely with NMV P26669 and P26671, without adding further information.

P27055 (CM 11) and P27056 (CM 12) are metacarpi of most the same size as in *Aptenodytes patagonicus* and similar in structure as far as preserved. This comparison makes reference to *Pseudaptenodytes macraei* plausible, even though these specimens are not from the same locality as the holotype and may not be of exactly the same age within the Cheltenhamian. NMV P26903 and CM 15 resemble a metacarpus referred to *Palaeospheniscus robustus* (Simpson

1946, Fig. 17B) in size and are referred to ? *P. minor* on similar grounds. In this case the locality and horizon are almost exactly as for the holotype. NMV P26903 is most nearly complete of the known Beaumaris metacarpi, and it alone has the distal end of the third metacarpal preserved, although it, too, has been abraded and has lost surface detail. Although of almost exactly the same length as the Patagonian specimen referred to *Palaeospheniscus robustus* it is somewhat smaller in both transverse dimensions, and the projection of the third metacarpal is more pronounced, about as great as an any Recent Spheniscinae. The latter characteristic is a distinction from the larger Seymour Island and New Zealand Miocene and earlier fossil species (see Simpson 1946, pp. 55-56, Marples 1952, pp. 19-20, and figures and references in those works).

Affinities: The imperfect material does not permit any close determination or extended discussion of the affinities of this genus. Its almost distinctive character, the morphology of the tricipital fossa, seems to be aberrant and does not link it with any other known group. In the Miocene most larger species have simple fossae and most smaller species bipartite fossae. *Pseudaptenodytes* has a double fossa, even though unusual in detail, and is near the size range of Miocene penguins with simple fossae, but also within the size range of Recent species, all of which have more or less distinctly double fossae.

I (Simpson 1946) proposed a division of Spheniscidae into four subfamilies. Some possibly diagnostic characters are unknown in *Pseudaptenodytes,* and on what little is known it could enter into either Palaeospheniscinae or Spheniscinae as I defined them. Marples (1952) found defects in my classification and proposed division of the family into Palaeeudyptinae and Spheniscinae, only. In that system, *Pseudaptenodytes* would belong in the Spheniscinae. I later (Simpson 1959) pointed out that Marples' system is also inacceptable. At present I see no way to make a plausible and workable subfamily classification. Brodkorb (1963), however, has adopted my previous division into four subfamilies.

It is a curious fact that no known pre-Pleistocene penguin is definitely or even probably ancestral to any Recent taxon. That is also true of *Pseudaptenodytes.*

Pseudaptenodytes macraei, new species

Etymology: For Mr Colin Macrae, an assiduous collector at Beaumaris.

Holotype: NMV P26668, left humerus, abraded and lacking distal end. From Spring Creek, Minhamite, Victoria. Presented 26 October 1916 by Mr J. Milligan.

Hypodigm: For taxonomic purposes, the type only. The following are referred with some doubt: P27055 (CM 11) partial metacarpus, from shore platform south of Keefer's boatshed, Beaumaris, Victoria; P27056 (CM 12) partial metacarpus, as P27055 (CM 11).

Known Distribution: Cheltenhamian Stage, Victoria, Australia.

Diagnosis: Humerus larger and its shaft stouter than in ? *P. minor.*

? **Pseudaptenodytes minor,** new species

Etymology: *Minor,* smaller.

Holotype: NMV P26669, right humerus, abraded and lacking proximal end. From Beaumaris, Victoria. Presented in 1888 (?) by Mr W. B. Jennings.

Hypodigm: The type and the following: NMV P26677, abraded distal end of right humerus, from shingle at Beaumaris, collected *circa* 1955 by Mr A. N.

Carter; NMV P26671, abraded proximal end of left humerus, in shingle at Beaumaris, F. A. Cudmore Collection (no date); NMV P26676, severely abraded proximal part of left humerus, from shingle at Beaumaris, collected *circa* 1955 by Mr A. N. Carter; NMV P26670, much abraded right humerus, from shingle at Beaumaris, F. A. Cudmore Collection (no date); P27057 (CM 16), much abraded right humerus, shore platform south of Keefer's boatshed, Beaumaris. Although not technically included in the hypodigm, the following are tentatively referred: P27058 (CM 15), incomplete metacarpus, as CM 16; NMV P26903, complete, moderately abraded metacarpus, collected by Mr W. Ridland, April 1969, *in situ* in nodule bed of Sandringham Sands at low tide level about 12 feet from shore opposite Dog Tooth Beacon, at point about half way between Hutchinson St. and Deauville Ave., Beaumaris—this is the only Beaumaris specimen definitely recorded as *in situ* and it is the only really complete penguin bone yet found there, but it is noteworthy that some rolling and abrasion had evidently occurred before burial.

KNOWN DISTRIBUTION: Cheltenhamian Stage, Beaumaris, Victoria, Australia.

DIAGNOSIS: Humerus smaller than that of *P. macraei,* shaft relatively and absolutely more slender, probably less sigmoid.

Spheniscidae Gen. et Sp. Indet.

P27059 (CM 14) from the shore platform south of Keefer's boatshed, Beaumaris, is the distal end and shaft of the left humerus of a penguin. These parts, rarely quite distinctive in any case, are here so heavily abraded that any identification beyond reference to the Spheniscidae seems unwarranted. The interest of the bone is its size, extraordinarily small among fossil penguins. Almost all other known fossil penguins range from about medium size for living forms (such as *Pygoscelis adeliae* or *Spheniscus humboldti*) through the size of the largest living species *(Aptenodytes forsteri)* and even well beyond that, for example in the huge *Pachydyptes ponderosus* of New Zealand. (See Simpson 1946, pp. 74-76.) P27059 (CM 14), on the other hand, is about the size of *Spheniscus mendiculus,* the smallest *Spheniscus* and the smallest living penguin except *Eudyptula minor* and the possibly synonymous *E. albosignata.* There is some suggestion, perhaps misleading, that the shaft of P27059 (CM 14) was slender and rather straight and that the distal end was somewhat more compressed, or less expanded, laterally than in *S. mendiculus.*

Argentine Specimens

Family SPHENISCIDAE

Genus **Chubutodyptes,** new

ETYMOLOGY: Chubut, the territory in Argentina where the specimens were found, and Greek *dyptes,* diver, commonly compounded in names of penguin genera.

TYPE SPECIES: *Chubutodyptes biloculata, infra.*

KNOWN DISTRIBUTION: Patagonian Stage of Chubut, Argentina.

DIAGNOSIS: Humerus generally palaeospheniscine in aspect but with proximal end widely expanded (lateromedially), with large but relative shallow tricipital fossa, bipartite with the two parts subequal in size and depth and almost directly medial and lateral with respect to each other.

DISCUSSION: This genus is now based on two specimens that I mentioned in 1946 (p. 51) as of an unnamed species and possibly new genus close to *Palaeo-*

spheniscus, one of which (AMNH 3341) was then figured (Fig. 13B). Hopes for more complete specimens have not been realized. The type species is larger than any referred to *Palaeospheniscus* and it is of special interest that no other known humeri of comparable size and age have such a distinctly bipartite tricipital fossa, a point to which students of fossil penguins have often directed attention, although its significance is highly doubtful. Details of the fossa are unique among those, Recent and fossil, known to me.

As in *Palaeospheniscus*, the width of the shaft of the humerus is decidedly greater distally than proximally and there is a well-marked preaxial angulation. Comparison is perhaps closest with humeri referred to *Palaeospheniscus robustus*, and the advisability of generic separation may be considered strengthened by the fact that there is some doubt whether those specimens are correctly placed in *Palaeospheniscus*.

Chubutodyptes biloculata, new species

ETYMOLOGY: Biloculata, two-chambered, in reference to the subequal division of the tricipital fossa.

HOLOTYPE: AMNH 3346 (Bird Catalogue of the Department of Vertebrate Palaeontology), right humerus, lacking approximately distal third and proximal end slightly broken. From Cerro Castillo, Chubut River Valley, Chubut, Argentina. Collected in 1933 by G. G. Simpson and party.

HYPODIGM: The holotype and AMNH 3341, somewhat broken proximal half of left humerus, from opposite Gaiman, Chubut River Valley, Chubut, Argentina. Collected in 1933 by G. G. Simpson and party.

KNOWN DISTRIBUTION: Basal beds of the Patagonian Stage, Chubut, Argentina.

DIAGNOSIS: The only known species of the genus as diagnosed *supra*.

REMARKS: The geology of the region from which these specimens come was discussed by Simpson (1935). Cerro Castillo, a large exposure of the lower Patagonian marine beds south of Trelew, is shown in that publication in Fig. 7. The complex section opposite Gaiman is shown in Fig. 1. AMNH 3341 and many other penguin bones came from bed g, shown in Fig. 1 and on page 7. There is still some uncertainty about the age of the lower part of the Patagonian formation and a corresponding early part of a marine stage and age (sometimes designated Juliense), but the consensus continues to place it in the early Miocene.

Acknowledgements

Mr H. E. Wilkinson, formerly in charge of fossil vertebrates at the National Museum of Victoria, made most of the Australian specimens available for this study. Included are numerous specimens collected by Mr Colin Macrae and one from Mr W. Ridland. Mr Edmund D. Gill, Deputy Director of the National Museum of Victoria, facilitated the project and provided some data on horizons and localities, further supplemented by Mr Thomas A. Darragh of that Museum. Dr R. R. Forster, Director of the Otago Museum, Dunedin, New Zealand, facilitated comparisons with fossil penguin specimens there. Dr Bobb Schaeffer, Chairman of the Department of Vertebrate Paleontology in the American Museum of Natural History, New York, facilitated comparisons with fossil penguins in that Department, with the assistance of Mr George O. Whitaker, and lent the Patagonian specimens here described. Dr Dean Amadon, Chairman of the Department of Ornithology in that Museum, facilitated comparisons with Recent penguins in that Department, with the assistance of Mr Charles E. O'Brien. Mr Vincent Maglio,

graduate student at Harvard University, took the photographs of the specimens. Except for comparisons made at other institutions, as noted above, this work was carried out at the Simroe Foundation, Tucson, Arizona, U.S.A. Throughout this research I was employed jointly by the Museum of Comparative Zoology, Harvard University, and the Department of Geology, University of Arizona.

References

BRODKORB, P., 1963. Catalogue of fossil birds. Part I (Archaeopterygiformes through Ardeiformes). *Bull. Fla. St. Mus.* 7 (4): 179-293.

BROWN, D. A., CAMPBELL, K. S. W., and CROOK, K. A. W., 1968. The geological evolution of Australia and New Zealand. Pergamon Press, Oxford, etc.

GILL, E. D., 1964. Rocks contiguous with the basaltic cuirass of Western Victoria. *Proc. Roy. Soc. Vict.* 77: 331-355.

MARPLES, B. J., 1952. Early Tertiary penguins of New Zealand. *N.Z. Geol. Surv., Pal. Bull.* 20.

SIMPSON, G. G., 1935. Early and Middle Tertiary geology of the Gaiman region, Chubut, Argentina. *Am. Mus. Novit.* 775.

————, 1946. Fossil penguins. *Bull. Am. Mus. Nat. Hist.* 87: 7-99.

————, 1957. Australian fossil penguins, with remarks on penguin evolution and distribution. *Rec. S. Aus. Mus.* 13: 51-70.

————, 1959. A new fossil penguin from Australia. *Proc. Roy. Soc. Vict.* 71: 113-119.

————, 1965. New record of a fossil penguin in Australia. *Proc. Roy. Soc. Vict.* 79: 91-93.

STIRTON, R. A., TEDFORD, R. H., and WOODBURNE, M. O., 1968. Australian Tertiary deposits containing terrestrial mammals. *Univ. Calif. Publs Geol. Sci.* 77: 1-30.

WILKINS, R. W. T., 1963. Relationships between the Mitchellian, Cheltenhamian and Kalimnan Stages in the Australian Tertiary. *Proc. Roy. Soc. Vict.* 76: 39-59.

PLATE 1

Fig. 1a, b—*Pseudaptenodytes macraei,* new genus and species. Partial left humerus, medial view. Holotype, NMV P26668. Stereo pair.

Fig. 2a, b—Same specimen as Fig. 1, slightly oblique posterior view of proximal end to show tricipital fossa. Stereo pair.

Fig. 3—? *Pseudaptenodytes minor,* new species. Broken and abraded proximal end of left humerus, posterior view for comparison with Fig. 2. NMV P 26671.

All figures natural size.

PLATE 2

Fig. 1—Incomplete metacarpus doubtfully referred to ? *Pseudaptenodytes minor* P27058 (CM 15).

Fig. 2a, b—*Pseudaptenodytes macraei,* new genus and species. Partial left humerus, posterior view. Holotype, NMV P26668. Stereo pair.

Fig. 3a, b—? *Pseudaptenodytes minor,* new species. Partial right humerus, medial view. Holotype, NMV P26669.

Fig. 4—Incomplete metacarpus doubtfully referred to *Pseudaptenodytes macraei* P27055 (CM 11).

All figures natural size.

PLATE 3

Fig. 1a, b—*Pseudaptenodytes macraei,* new genus and species. Partial left humerus, lateral view. Holotype, NMV P26668. Stereo pair.

Fig. 2—*Palaeospheniscus robustus.* Left humerus, medial view. Patagonian formation, Chubut, Argentina. For comparison with Plate I, Fig. 1.

Fig. 3a, b—Same specimen as Fig. 2. Lateral view. For comparison with Fig. 1 and Plate IV, Figs 2 and 4. Stereo pair.

All figures natural size.

PLATE 4

Chubutodyptes biloculata, new genus and species.

Fig. 1a, b—Incomplete right humerus, posterior view. Holotype, AMNH 3346. Stereo pair.

Fig. 2—Same specimen as Fig. 1. Lateral view.

Fig. 3a, b—Incomplete left humerus, posterior view. AMNH 3341. Stereo pair.

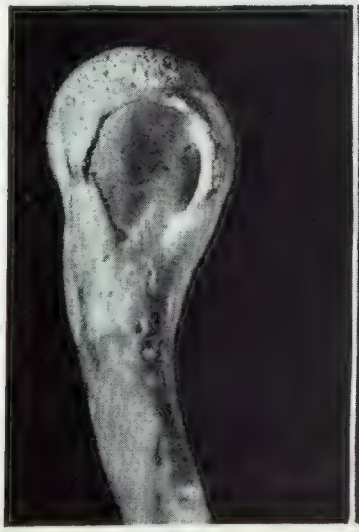
Fig. 4—Same specimen as Fig. 3. Lateral view.

All figures natural size.

1a

1b

2a



2b

3

1

2a

2b

3a

3b

4

1a

1b

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3b

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4

PAINTED ABORIGINAL ROCK SHELTER ON MOUNT PORCUPINE, NE. VICTORIA, AUSTRALIA

By A. L. West
Curator in Anthropology

Abstract

Aboriginal painted figures and their rock shelter environment on Mt Porcupine, NE. Victoria, are described. The site is the fourth so far discovered in this area of the State. Generally the figures conform in style with Aboriginal paintings in the Grampians area of Victoria and with those in W. New South Wales. Two painted hand silhouettes about twice life size are probably unique in Australia.

Introduction

In 1968 Mr T. Boyce of Wodonga reported to the National Museum of Victoria the existence of a rock shelter containing Aboriginal paintings which had been known to him for a number of years. The site, on Mt Porcupine near Thologolong Station in the Upper Murray Valley, was investigated and recorded by the author and D. A. Casey, Honorary Associate in Anthropology at the National Museum of Victoria.

Location

Mt Porcupine consists of granite and, as the name suggests, is somewhat hump-shaped in outline. Its N. spur is skirted by the Murray Valley Highway about 60 miles (96·5 km) E. of Wodonga. Looking due W. from the 61 mile (98·1 km) post the shelter is clearly visible as a horizontal ledge of rock rather more than halfway up the spur. It is 121 m above the level of the road and commands a magnificent view to the east along the river valley. The land to the east, at the foot of the mountain, has been cleared and is used for grazing but the mountain itself is thickly timbered with a variety of eucalypts and Prickly Tea Tree *(L. juniperium)*. There are also occasional Casuarinas and a scattering of Red Cypress Pines *(C. endlicheri)*. The trees are 'scrubby' and shallow-rooted on account of the steepness of the hillside and the rocky shallow soil.

Rock Outcrop and Shelter

The rock shelter is part of a massive outcrop of fine-grained granite. An almost vertical rock face runs for 67 m in a N-S. direction and rises to a maximum height of 11 m. The more or less flat top of the outcrop disappears into the slope of the hill about 11 m back from the vertical face.

Falls of rock from the face of the outcrop created the shelter. Overhanging rock now provides protection over an area 17 m by 1·5 to 5 m, although what may be called the shelter proper is only 11 m in width by an average of 2·4 m in depth. The floor is a partly moss-covered ledge of rock which slopes towards the front of the shelter. It carries no occupation deposit and there is no other evidence of human occupation. At the S. end a huge slice of fallen rock forms a wall which leads for some distance into a funnel-shaped cavity in the outcrop. The back (W.) wall of the shelter on which most of the paintings appear rises almost vertically

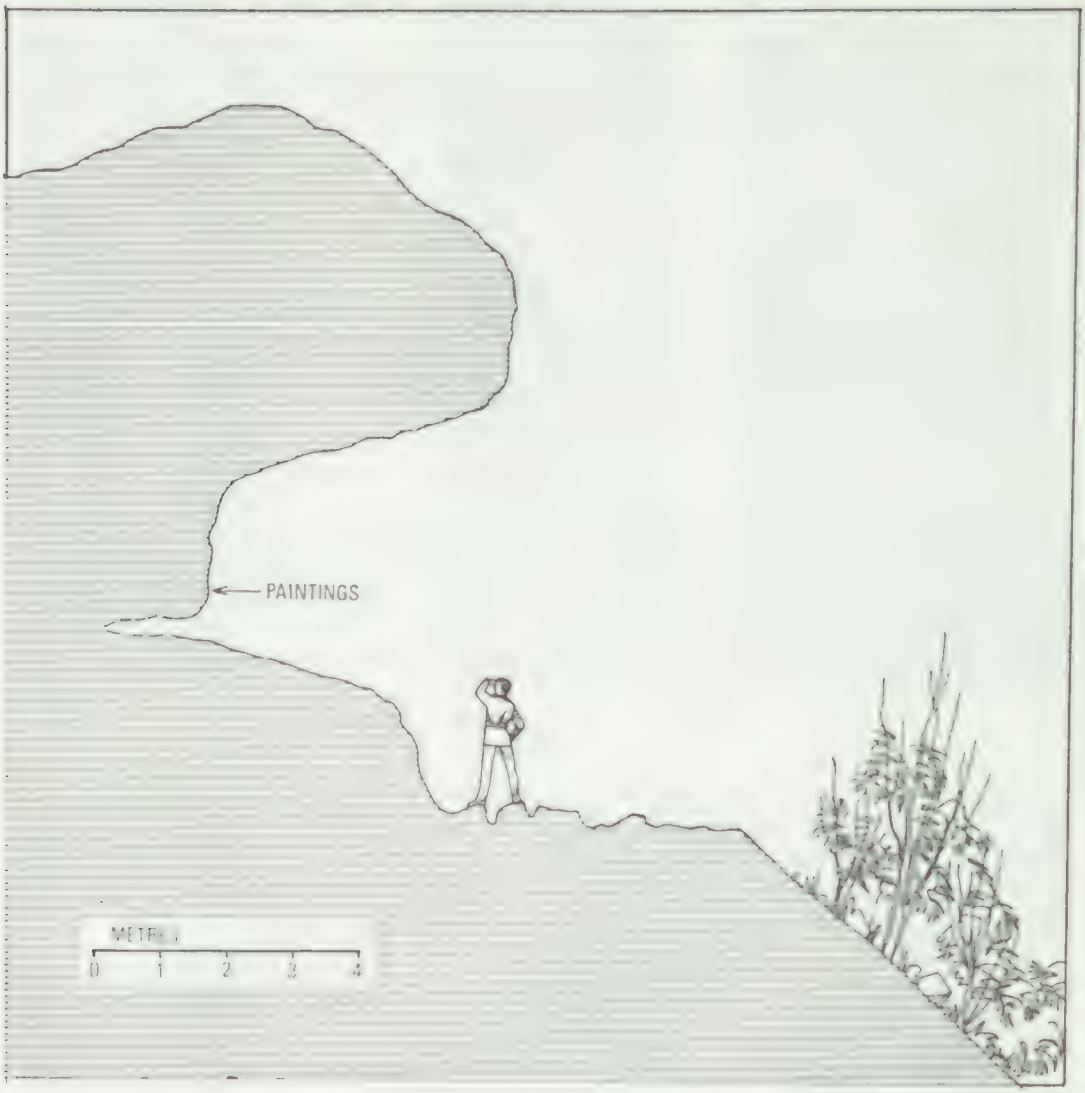


FIG. 1. Profile of Aboriginal painted rock shelter, Mt. Porcupine, Victoria.

for 3·9 m but then arches overhead and becomes vertical again. Where water runs down this elevated and exposed perpendicular face there is a blackish stain which contrasts sharply with the buff-coloured protected rock beneath. Swallows and wasps have availed themselves of this shelter, scores of mud nests being attached to the ceiling.

Painted Figures

The paintings (Fig. 2 and Plate 5) are on the most protected inner wall of the shelter. The rock is grey to pinkish-grey and has a smooth texture suitable for painting. There are nine figures on the wall scattered over an area 4 m by 1½ m. They are all in red ochre and vary considerably in density and clarity. All of the

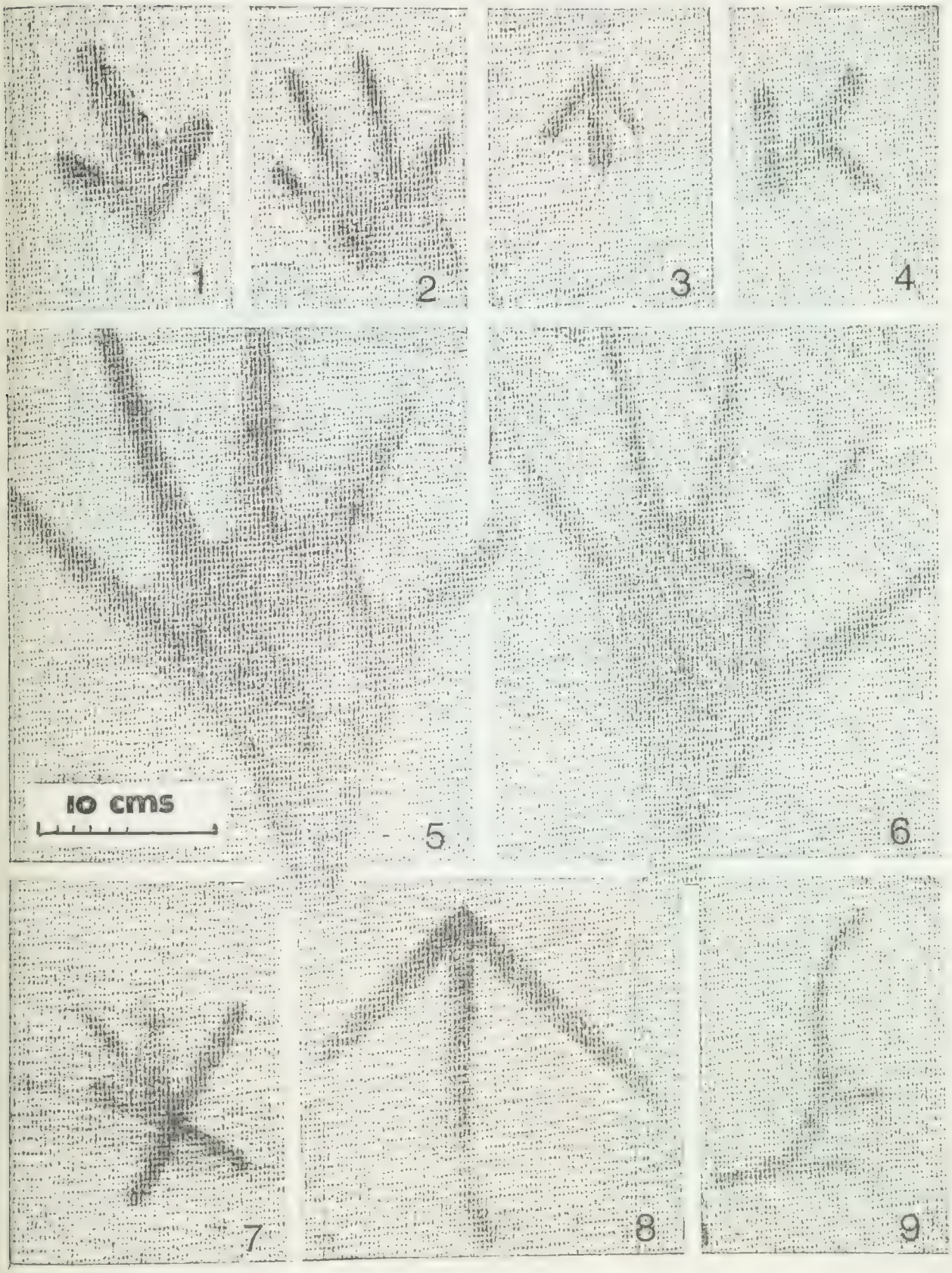


FIG. 2.

figures could have been painted comfortably from a squatting or standing position.

S. of the shelter on the almost vertical rock face there are three other painted areas. At these places the figures are linear marks ranging from 5 to 12·7 cm in length and from 0·6 to 1·3 cm in thickness. They are very faded because of the exposed position. Two strokes 1·8 m above ground level can be seen 11·2 m S. of the shelter. There is a single line 0·9 m above ground level 17·3 m further S. while 0·7 m further S. again there are four 'tally' marks 0·6 m above the ground.

Of the figures within the shelter, No. 1 is a well drawn and clear representation of an emu's footprint. A few centimetres below and to the left (S.) there is a similar but more faded 'footprint' which has had two lines in the form of a cross superimposed on it. The superimposed lines are denser in colour than the 'footprint'. No. 4 may also represent an emu's footprint but is so faded as to make any interpretation difficult. The most striking figures are Nos. 5 and 6 which are large paintings of a pair of human hands. These are well drawn with the thumbs adjacent to each other as if the palms were being pressed against the granite. At their bases the red ochre blends with the pinkish orthoclase mineral in the rock but there is sufficient clarity to enable the viewer to see that each base tapers to a 'V'. A third figure which may represent a smaller painted hand is No. 2 but any interpretation must be tentative. No. 9 is an indeterminate 'S' shaped figure. The remaining shapes (Nos. 3 and 8) are large and small 'arrow heads' or 'bird footprints'. These may, in fact, represent bird prints and similar figures in the Mudgegonga rock shelter near Myrtleford, NE. Victoria, have been so interpreted (Massola 1966) but one cannot be sure. A number of the white ochred 'bird prints' at Mudgegonga have rudimentary 'heads' and may be stylized paintings of human figures. Although the two 'bird prints' in the Mt Porcupine shelter do not have 'heads' they are oriented similarly ('arrow points' upwards) to the Mudgegonga figures which I suggest may represent humans. Further they are in reverse orientation to the unmistakable 'emu prints' at Mt Porcupine. This inconsistency in orientation would be of little significance if some kind of composition could be detected. With the possible exception of the two hand silhouettes which may have been painted in relationship to each other, there is no apparent composition. But if Nos. 3 and 8 are stylized human figures the absence of a forking in the vertical central line to represent legs is somewhat unusual.

Discussion

The painted shelter on Mt Porcupine is the fourth so far reported in NE. Victoria. Tugby (1953) and later Mitchell (1954) published accounts of the same site in the Conic Range near Darbyshire, and Massola (1960, 1966) wrote of one near Beechworth and another near Mudgegonga.

With the exception of the Beechworth shelter in which there are two large outline figures, the art style in the four reported sites is similar. The motifs are either linear paintings ('bird prints', human stick figures, indeterminate geometries) or silhouettes ('hands', 'human figures' and a 'wallaby' or 'kangaroo'). Generally the figures are small, and resemble in style the Aboriginal paintings in the Grampians of W. Victoria and in W. New South Wales.

The large 'hand' paintings at Mt Porcupine which are about twice life size seem to reveal an element of composition. The 'hands' may have been drawn in relation to each other. They are side by side with a distance of 2 cm separating the two thumbs. Human hand motifs in Aboriginal art are common but they usually appear as negative stencils as for instance in the so-called Cave of Hands in the Grampians. Such stencils are produced by holding the hand against the rock and blowing pigment from the mouth onto and around it. Less frequently,

positive impressions are made by pressing a freshly ochred hand onto the rock surface. There are no examples of this in Victoria. Giant painted hand silhouettes such as Nos. 5 and 6 do not, to my knowledge, occur anywhere else in Australia.

Acknowledgements

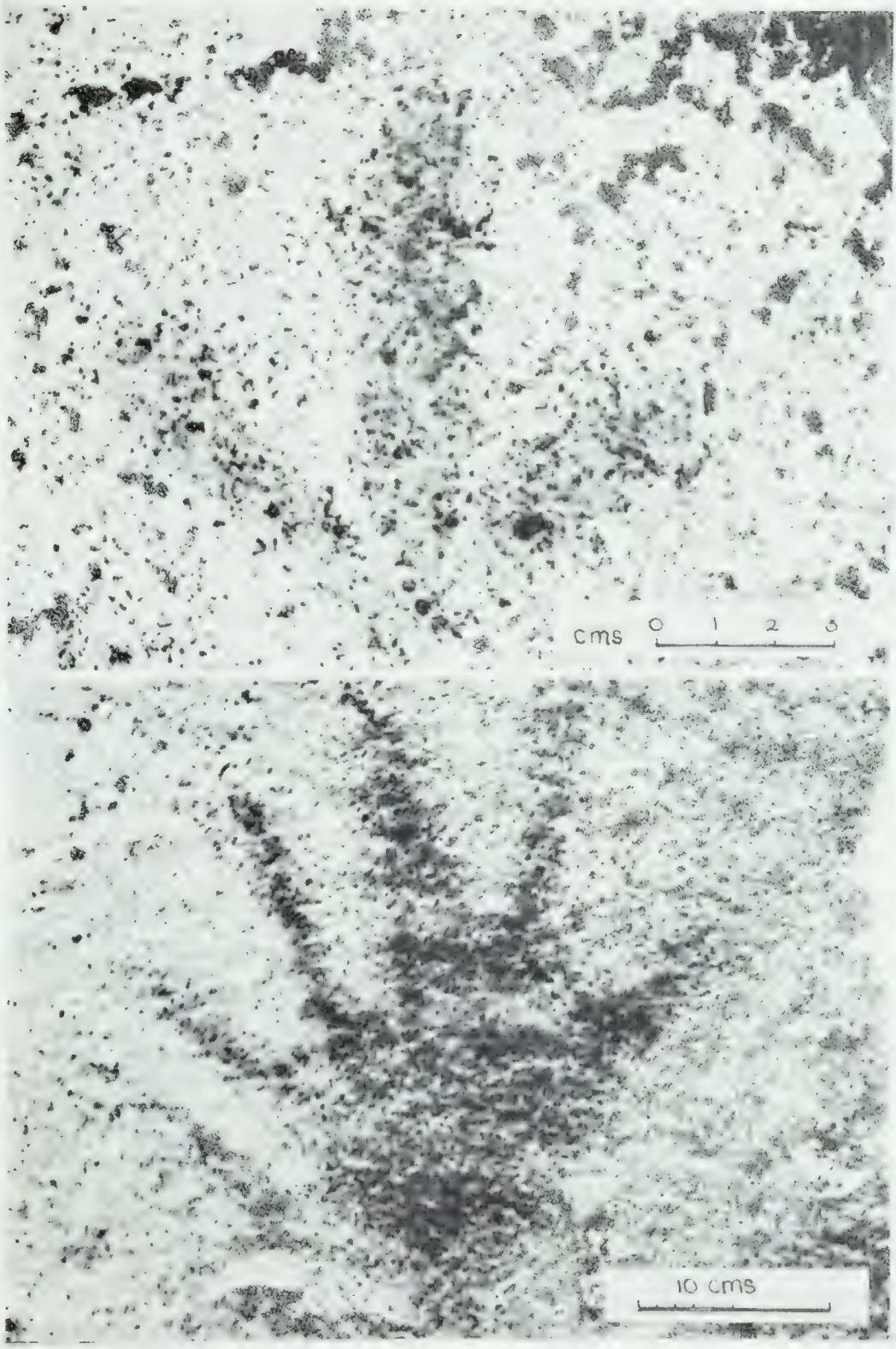
Appreciation is expressed to Mr T. Boyce of Wodonga who first reported the existence of the painted figures and to Mr J. Sutherland of Walwa who provided hospitality and assistance at the site. I am also grateful for field work assistance to D. A. Casey, R. Miller and D. Morgan. Drawings were prepared by Mr Miller, Education Officer, National Museum of Victoria.

References

Massola, A., 1960. Native Painted Shelter at Beechworth. *Vict. Nat.* 77: 97-99.
————, 1966. The Rock-Shelter at Mudgegonga. *Vict. Nat.* 83: 73-74.
Mitchell, J. R., 1954. Petrographs in the Koetong Creek Valley. *Vict. Nat.* 70: 219-221.
Tugby, D. J., 1953. Conic Range Rock Shelter: A Preliminary Account of Rock Paintings in North-east Victoria. *Mankind* 4: 446-450.

Explanation of Plate 5

Upper—Painting of an emu's footprint, Mt Porcupine rock shelter.
Lower—Painting of a human hand, same site.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THE REPRODUCTION AND LIFE HISTORY OF *MICROGINELLA MINUTISSIMA* (TENISON-WOODS, 1876) (GASTROPODA: MARGINELLIDAE)

By Florence V. Murray
Honorary Associate in Invertebrates

Abstract

M. minutissima inhabits *Amathia biseriata,* a colonial polyzoan on which it carries out its life cycle. Spawning takes place throughout the year. Tough-walled, transparent egg capsules are deposited singly on the stem of the host substrate; each contains one red-coloured egg which is irregularly tubular in shape when new-laid but becomes spherical prior to cleaving. After an embryonic period of six to seven weeks a well-developed juvenile crawls from the capsule which breaks open dorsally.

Some observations on the living animal and its behaviour are included.

Introduction

Approximately 200 species of Marginellidae have been recorded from Australian seas: they are nearly all small, often minute, rarely over 5 or 6 mm; the majority are white and highly polished (Laseron 1957). In recent years increasing interest has been shown in the taxonomy of the group, but as little attention has been given to the living animals, life histories or reproductive patterns, the present study was undertaken to help meet this deficiency.

The opportunity to carry out the work was provided by Mrs Jeanette Watson of the Underwater Research Group of Victoria, who while diving in Westernport Bay noticed this small mollusc living in abundance on colonies of the polyzoan, *Amathia biseriata* Krauss 1837, and who kindly collected samples for me over a period of two years. The first of these came from 13 m of water near Eagle Rock, in February 1967, and carried eggs at various stages of development, juveniles and adults, thus indicating the life history pattern and initiating the observations recorded in the following pages.

Genus **Microginella** Laseron, 1957

Microginella minutissima (Tenison-Woods, 1876)

Marginella minutissima Tenison-Woods 1876, *Pap. Proc. Roy. Soc. Tas.*, p. 27.
Marginella pumilio Tate & May 1901, *Proc. Linn. Soc. N.S.W.* 26: 363.
Microginella pumilio Macpherson & Gabriel 1962, Marine Molluscs of Victoria, p. 229.

The species was described by Tenison-Woods from a single specimen, the holotype, which was dredged by the Rev. H. D. Atkinson at 6 fm in Long Bay, D'Entrecasteaux Channel, Tasmania, and is in good condition today. It is housed in the Tasmanian Museum, Hobart, Reg. no. E661/8002 (TM5327).

The name *minutissima* was superseded in 1901 by *pumilio* Tate & May, but reverts back to *minutissima* in view of the following data kindly supplied by Dr W. F. Ponder of the Australian Museum, Sydney:

> 'Tate & May (1901) erected *pumilio* stating that there was a prior *minutissima* Michelin but did not give any date or reference for Michelin's species. Fortunately Tate & May's proofs for their paper are available here and on it is crossed out after Michelin "Gen Rissoa". The full reference to this is Descr. genre Rissoa, 1830, p. 17, and *minutissima* is described as a *Rissoa*. It appears as though there has been an unfortunate error on the part of the authors or

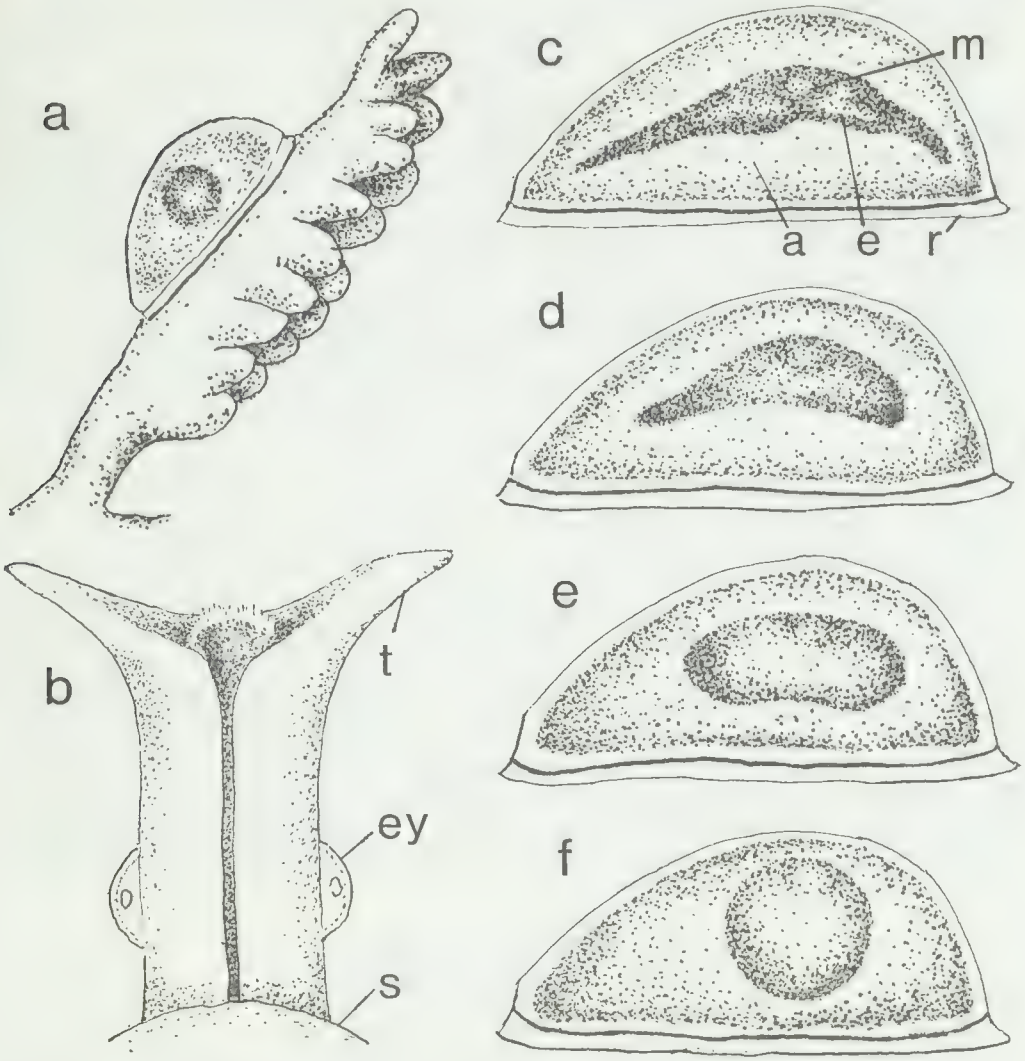

FIG. 1—a. Egg capsule of *M. minutissima* on stem of *A. biseriata*. b. The head/siphon (Dorsal view). c. Egg capsule containing a new-laid egg. d. Same egg four hours after laying. e. *Same* six hours after laying. f. *Same* eight hours after laying.
Abbreviations: a, albumen sac; e, egg; ey, eye; m, micropyle; r, rim; s, edge of shell; t, tentacle.

the capsule (Fig. 1a). The spawning rate appeared to vary with individual females but could be assessed as averaging one egg every 2± days.

The egg, when first seen after deposition, appears as a long, uneven, red-coloured tube, narrow at the ends and broadening towards the central portion where a micropyle is conspicuous (Fig. 1c). This tubular egg-structure soon begins to re-form and continually changes in shape until it becomes spherical: four hours after extrusion it appears less irregular, shorter and wider (Fig. 1d); within the next hour it becomes cylindrical (Fig. 1e); an hour later it is ovate; and after a further two hours is spherical measuring 0·3 mm across (Fig. 1f). Thus, at a water temperature of 15·5°C., the new-laid egg takes at least eight hours to reach

the printers. There is no *Marginella minutissima* (of any author) listed in Sherborn (up to 1830) but I have not checked the intervening years. However, Tomlin (1917, *Proc. malac. Soc. Lond.* 12, p. 292) lists *pumilio* as the replacement name for *minutissima* but he also failed to find any *Marginella minutissima* Michelin, and there are no prior *M. minutissima.*

'May (1921, Checklist) uses *minutissima,* giving *pumilio* as a synonym and May & Macpherson (1958) also use it. I don't think the reasons for reverting back to *minutissima* have ever been published but I have not carefully checked the literature after about the late 1920's.

'Clearly the only course of action is to revert to *minutissima* Tenison-Woods with *pumilio* as a synonym.'

M. minutissima is minute, average adult specimens measuring only 2·8 × 1·7 × 1·6 mm in length, width and height. Like most prosobranchs it is dioecious but no significant degree of sexual dimorphism is evident externally apart from the presence of a penis in male animals.

The shells are pearly-white, smooth and polished, with the spire involute and a whorl produced above; the aperture is curved and narrow, being only 0·2 mm across at its minimum width.

The animal is a rich orange-yellow; its mantle is smooth and when fully raised over the shell the lobes meet at varying heights on the right side. The siphon and head are represented by a single structure in the form of an open channel with the lateral margins produced into 'tentacles' at the anterior end; a bright-red eye is conspicuous in a swelling on each side (Fig. 1b). The foot lacks an operculum and folds longitudinally on retraction; it is finely ciliated, narrow and tapers posteriorly. The propodium is bifurcate; the sinuation is spanned dorsally by a colourless, bridge-like structure which runs back over the foot to the body wall beneath the labial opening. This structure, presumably a labial palp, is highly contractile and appears to be associated with the extrusion of the proboscis and to assist the propodial lobes in supporting the buccal mass on the host stem during the feeding process: the stem is penetrated and the contents sucked out through the puncture.

Material and Methods

Living specimens of *M. minutissima* were maintained on branches of *A. biseriata* in glass dishes sufficiently shallow for observation, without disturbance, under a stereoscopic microscope. Air bubbles were syringed into the dishes several times a day, and the water changed once a week. Under these conditions, and at an average water temperature of 15·5°C., the molluscs fed, paired, spawned and lived for as long as six months.

Egg capsules, attached to portions of the substrate or detached from it, were maintained separately in small petri dishes. Those deposited in captivity were consistent with those from the field.

Reproduction

Samples of *A. biseriata* examined during all seasons carried egg capsules and juveniles of *M. minutissima* indicating that the species breeds throughout the year.

The spawn consists of individual, ovoid-elongate capsules averaging 1·21 × 0·45 × 0·50 mm in length, width and height; each is transparent, tough-walled, and attached by a narrow base around which is a bordering rim; it is invariably moulded lengthwise over the smooth and convex part of the host stem thus creating a corresponding concavity along the basal plate. Within the capsule is a single red-yolked egg suspended in a colourless albumen contained in a sac which lines

its spherical state in which it remains for about 12 hours before showing signs of cleaving.

The first division is equal, the two resulting blastomeres appearing almost to separate; these also divide equally but the third cleavage is unequal giving rise to four large, red-yolked megameres and four very small, transparent micromeres at the dorsal or animal pole. Spiral cleavage continues with the micromeres spreading over the megameres and a solid, spherical blastula is formed followed by a gastrula stage. Within 10 days the embryo consists of a large, red-coloured cephalic region with two outgrowths of transparent tissue: the ventral one will become the foot and the postero-dorsal one, the visceral mass. The cephalic mass is gradually absorbed as growth and differentiation proceed and finally disappears either just before or shortly after hatching. The velum is suppressed. The early embryo slowly rotates in the albumen, but this rotation ceases as the foot and visceral mass gain in size. After an embryonic period of six to seven weeks the young marginellid almost fills the capsule; its mantle lobes are fully raised over the shell and some general movement is noticeable; it crawls from the capsule which breaks open dorsally, and settles down on the host substrate. This newly-hatched juvenile is a well-developed miniature of the parent with a shell 0·75 mm long; its soft parts are a delicate pale yellow. Specimens were maintained on portions of the host substrate for several months and some growth noted, but the experiment was terminated before the time taken by them to reach maturity had been ascertained.

Pairing was observed in a number of instances, the same procedure pertaining on each occasion. The mating position differs from that usually described for prosobranchs in that the male approaches the posterior end of the mantle cavity of the female. The foot of the female is firmly attached to the substrate and its body pulled forward leaving a spacious posterior mantle cavity; the male mounts the female in a postero-dorsal position from where it passes its long, pointed penis into the mantle cavity at the left of the female, and presumably round the back of the body to the right side in order to reach the genital opening. Mating pairs usually remained in union for several hours, the female being extremely passive and immobile during the entire period.

Polyzoan Host Substrate

Amathia biseriata Krauss, 1837

Amathia inarmata Macgillivray 1886, *Trans. Roy. Soc. Vict.* 23: 183.

This colonial polyzoan ranges from New South Wales through to South Australia and is also recorded from South Africa. In Westernport, Victoria, it is a common species found in water below 10 m and favouring swift-flowing currents; in one instance, near Corinella, colonies were noted in a deep channel at 40 m where the water was muddy and conditions comparatively dark.

Since *M. minutissima* feeds and breeds on *A. biseriata*, it seems plausible to assume that this polyzoan provides an exclusive habitat for the marginellid and perhaps determines its distribution.

A growth series of shells has been placed in the National Museum collection (F26389); also egg capsules containing eggs and embryos (F26390).

Acknowledgements

I am much indebted to Mrs Jeanette Watson who collected the material and provided the field data; to Dr W. F. Ponder who identified the marginellid and traced its taxonomy; to Mrs E. Turner of the Tasmanian Museum, Hobart, for details concerning the holotype; and to Dr Imm. Vigeland of the University of Oslo for his identification of the polyzoan.

My thanks are also due to Dr B. J. Smith of the National Museum of Victoria for reading the manuscript and making helpful suggestions, and to Mr G. J. Browning of the same Museum for the illustrations.

References

KNUDSEN, J., 1950. Egg capsules and development of some marine prosobranchs from tropical West Africa. *Atlantide Rep.* 1: 110-116.

KRAUSS, C. F. F., 1837. Beitrag zur Kentniss der Corallinen und Zoophyten der Südsee, p. 37. Stuttgart.

LASERON, C. F., 1957. A new classification of the Australian Marginellidae, with a review of Solanderian and Dampierian Zoogeographical Provinces. *Aust. J. mar. freshw. Res.* 8: 274-311.

MACGILLIVRAY, P. H., 1886. Descriptions of new, or little-known, Polyzoa. *Trans. Roy. Soc. Vict.* 23: 179-186.

TATE, R., and MAY, W. L., 1901. A revised census of the marine molluscs of Tasmania. *Proc. Linn. Soc. N.S.W.* 26: 344-471.

TENISON-WOODS, J. E., 1876. On some new species of Tasmanian marine shells. *Pap. Proc. Roy. Soc. Tas.* for 1875, pp. 27-29.

PHYLLIDIA (PHYLLIDIELLA) ZEYLANICA KELAART, A RARE NUDIBRANCH FROM THE INDIAN SUBCONTINENT

By Robert Burn
Honorary Associate in Invertebrates

Abstract

The recently rediscovered *Phyllidia zeylanica* Kelaart (1858) from the Gulf of Kutch is a valid species referable to the subgenus *Phyllidiella* Bergh (1869). Its specific characteristics are three concentric black bands upon the notum and the pink tubercles crowded into longitudinal series. Other records of Phyllidiidae from the Indian Subcontinent are *P. ocellata* Cuvier (1804), a prior synonym of *P. multituberculata* Boettger (1918), and the radially patterned *P. elegans* Bergh (1869).

Introduction

Two specimens of the recently rediscovered *Phyllidia zeylanica* Kelaart (1858) have been examined and compared with other species by the writer, in order to justify the identification proposed by Narayanan (1969: 205) and to establish the species as a valid taxonomic unit. This research was undertaken as an addendum to the writer's nearly completed studies on the family Phyllidiidae in Australian waters.

The writer in indebted to the Fisheries Research Station, Government of Gujarat, Jamnagar, India, for permission to study and report upon the specimens from their Museum, and to Mr K. R. Narayanan, Senior Research Assistant, for first directing attention to the specimens. This research was carried out while the writer was in receipt of a grant from the Science and Industry Endowment Fund, CSIRO.

Description

Phyllidia (Phyllidiella) zeylanica Kelaart

Phyllidia zeylanica Kelaart, 1858: 120; 1859: 494; Eliot, 1906: 674, pl. 42, fig. 10; Pruvot-Fol, 1956: 67; Narayanan, 1969: 205, fig. 14-15.
Phyllidia ceylanica (sic) Bergh, 1869: 509 and footnote.

Material. Pirotan Island, off Jamnagar, Gulf of Kutch, India, October 1966 and March 1967, two specimens collected by Mr K. R. Narayanan. They were taken from knee-deep intertidal pools, fringed by massive living corals (genus *Favia* ?) and with much seaweed growing in them. One specimen was found suspended from the surface (? by mucus) and the other was resting at the hard bottom of the pool. The specmiens are deposited in the Museum of the Fisheries Research Station, Government of Gujarat, Jamnagar, India.

Description. The two preserved specimens measure respectively 21 and 18 mm in length, 11·5 and 8 mm in breadth, and 5 and 3 mm in height. Alive they were 22 and 20 mm in length, with pink tubercles separated by black lines on the notum (Narayanan 1969). As preserved, both specimens (Pl. 6, figs. a-b) have a pale greenish-yellow body colour distinctively patterned with black on the notum. The pattern of the black lines agrees precisely with Kelaart's description (1858) and his figure in Eliot (1906). In addition to the three nearly continuous black bands encircling the notum, there is an interrupted median line of black. The outermost

its colour patterning of three concentric black bands separated by rows of pink tubercles on the notum. It is nearest to the Tahitian *P. (Phyllidiella) rosans* Bergh 1873: 66, = *P. nigra* Pease, 1868: 80, non van Hasselt, 1824), which differs notally only in the tawny-pink tubercles forming low ridges instead of rows of distinct tubercles, and five instead of three concentric black bands. The pharyngeal parts of *P. rosans* have many more small oral glands than reported here for *P. zeylanica,* but this may be due to the differences in size of the examined animals: *rosans* 32 mm and *zeylanica* 18 mm. It is not improbable that *P. zeylanica* and *P. rosans* represent relict populations of a once widespread Indo-West Pacific species; examination of more material of each species might indicate that the latter should be regarded as a subspecies of the former.

P. zeylanica is distinguished from other species of the subgenus *Phyllidiella* by the absence of large or small tubercles spread evenly over the notum (*P. pustulosa* Cuvier, 1804), or gathered together in quincunces (*P. nobilis* Bergh, 1869) or longitudinal compound series (*P. catena* Pruvot-Fol, 1956 and *P. seriata* Pruvot-Fol, 1957).

There are very few records of Phyllidiidae from the Indian Subcontinent. Kelaart's specimen of *P. zeylanica* came from Trincomalie, Ceylon, and the present specimens from the Gulf of Kutch which lies over 1000 miles to the northwest. Farran (1905: 345) recorded specimens from the Gulf of Mannar under the names *P. varicosa* and *P. nobilis.* From their descriptions, the first is possibly *P. ocellata* Cuvier (1804), referred to below, and the second is the radially patterned *P. elegans* Bergh (1869). O'Donoghue (1931: 164) reported *P. multituberculata* Boettger (1918) from 40-50 fm off Madras. Through the good offices of Dr S. T. Satymurti, Director of Museums, Madras, a photograph (Pl. 6, fig. d) of the larger of O'Donoghue's two specimens was obtained, from which the identification was confirmed. However, comparison of the original figure and the present photograph of *P. multituberculata* with the redescription and figures of the type of *P. ocellata* Cuvier (1804; Pruvot-Fol, 1956: 62, fig. 2) show that they are one and the same species. Accordingly, the former taxon must be replaced by the latter in Indian faunal lists.

References

Bergh R., 1869. Bidrag til en monographi af Phyllidierne. *Naturhist. Tidsskr.* (3) 5: 357-524.

————, 1873. Neue nacktschnecken de Südsee, Malacologische Untersuchungen, I. *J. Mus. Godeffroy* 1 (2): 65-96.

————, 1892. *Malacologische Untersuchungen* Heft 3 (18), System der Nudibranchiaten Gasteropoden. In: *Reisen im Archipel der Philippinen* (by C. Semper). *Wiss. Resultate* 2: 995-1165.

Eliot, C. N. E., 1906. On the nudibranchs of southern India and Ceylon, with special reference to the drawings of Kelaart etc. *Proc. Zool. Soc. Lond.* 76: 636-691.

Farran, G. P., 1905. Report on the opisthobranchiate Mollusca etc. In: *Report on the Pearl Oyster Fisheries of the Gulf of Mannar* (by W. A. Herdman). 3 Suppl. Rep. 21: 329-364.

Kelaart, E. F., 1858. Description of new and little known species of Ceylon nudibranchiate Mollusca and Zoophytes. *J. R. Asiatic Soc. Ceylon Branch* 3 (1): 84-139.

————, 1859. Description of new or little known species of Ceylonese nudibranchiate mollusks. *Ann. Mag. Nat. Hist.* (3) 3: 488-496.

Narayanan, K. R., 1969. On the opisthobranchiate fauna of the Gulf of Kutch. *Proc. Symp. Mollusca Ernakulum* 1: 188-213.

O'Donoghue, C. H., 1931. Notes on Nudibranchiata from south India. *Proc. malac. Soc. Lond.* 6: 141-166.

Pease, W., 1868. Descriptions of marine Gasteropodae inhabiting Polynesia. *Am. J. Conch.* 4: 71-80.

Pruvot-Fol, A., 1956. Révision de la famille des Phyllidiadae, I. *J. Conch., Paris* 96 (2): 55-80.

————, 1957. Révision de la famille des Phyllidiadae, II. *J. Conch., Paris* 97 (3): 104-135.

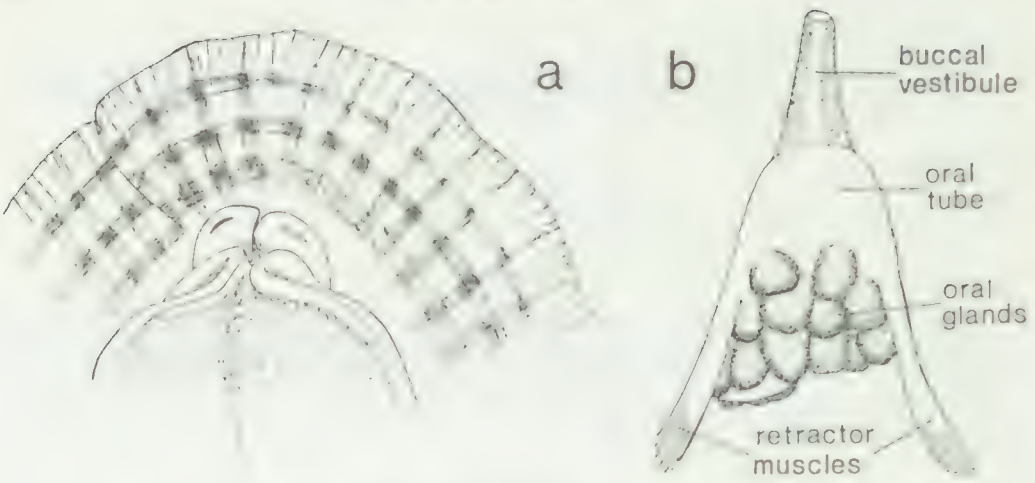

FIG. 1—a. Ventral aspect of anterior body; b. Dorsal aspect of pharyngeal parts.

band is very narrow and just within the notal margin. The second band is wider than the outermost and separated from it by a single row of tubercles. The innermost band is at least twice as wide as the second and separated from it by a double or rarely triple row of generally larger tubercles. The interrupted median line is separated from the innermost band by a single row of tubercles along each side. The rhinophoral and anal cavities lie within the innermost band. The black peritonium shows externally through the sole of the foot and in the inner hyponotum; in life, it was bluish-grey.

The notal ornament follows the colour pattern in that, except in the median line, there are no tubercles in the black-pigmented bands. The tubercles are generally rather small, conical in shape with rounded tops. The anal aperture opens at the top of a tubercle. The rhinophoral cavities have low sheaths, and the rhinophores are black.

The sole is thin marginally, deeply indented anteriorly but not notched, and there is no median colour line. The contiguous oral tentacles are small, flatly tapering and laterally furrowed (Fig. 1a). The long buccal vestibule is wider posteriorly. The cream oral tube is flask-shaped and covered posteriorly with flat scale-like oral glands (Fig. 1b).

Discussion

Until the collection of these two specimens, *P. zeylanica* was a lost species that had not been seen for 110 years. Even with its rediscovery, it remains a very rare species; Kelaart had only one specimen, the repository of which is unknown, and no other specimens have been noticed in the literature of the intervening years. Bergh (1892: 1128) included *P. zeylanica* among the synonyms of *P. varicosa* Lamarck (1801), but as Eliot later pointed out (1906: 674) and confirmed by the present study, this identification cannot be justified. Colouration, pattern of the notal tubercles, and shape of the pharyngeal parts differ in the two species, and moreover, according to the writer's nearly completed studies on the Australian Phyllidiidae, each species belongs to a different subgenus. *P. varicosa* belongs to the nominal subgenus *Phyllidia,* and *P. zeylanica* to the subgenus *Phyllidiella* Bergh (1869).

P. zeylanica is characterized by its small size of under 25 mm in length and

PLATE 6

Phyllidia (Phyllidiella) zeylanica Kelaart.

a. Dorsal view of larger specimen.
b. Dorsal view of smaller specimen.
c. Ventral view of same.

Photographs by Brian J. Smith.

Phyllidia (Phyliddia) ocellata Cuvier.

d. Dorsal view of O'Donoghue's larger specimen, length 48 mm.

Photograph by Madras Government Museum, India.


a
b
c
d

BASSIANOBDELLA VICTORIAE gen. et sp. nov. (HIRUDINOIDEA: RICHARDSONIANIDAE)[1]

By Laurence R. Richardson[2]

Abstract

Somites ix to xxiv, 5-annulate (total 16); xxv, 4-annulate; no salivary gland papillae; median regions, bimyomeric, mesomorphic; vagina caecate, U-form with a duct; common oviduct, short, not associated with the duct, a median black and 3 pairs of paler dark dorsal bands. Bassian sub-region.

Introduction

All previous records of aquatic jawed sanguivorous leeches from Victoria have been referred to *Limnobdella australis,* a species described very briefly in the classical manner by Bosisto in 1859 from specimens from the Murray as being *'Hirudo'*-like in general appearance with a median and two pairs of dark longitudinal bands, figured as such by Becker (1859), and as I now find, not recognizably described again since then.

A small leech taken by Dr W. D. Williams of Monash University at Cranbourne, an outer Melbourne suburb, has seven longitudinal dark bands, enabling me to recognize this as the pattern faintly indicated in faded specimens taken in 1904 at Thornton on the Goulburn River, and housed in the collections of the National Museum of Victoria. Dr Williams's specimen is somewhat strongly contracted; the Thornton specimens are extended and more suitable for most description.

The indications are that this may be found a common and widespread species in Victoria. It might possibly be the 'horse-leech' of Bosisto, figured by Becker as having an obvious median dorsal band, and noted by Becker as having 'a central line of jet black colour and three faint brown parallel lines on either side', a species not reported since. Both go grey in alcohol.

A current study of the nature of speciation in aquatic jawed sanguivorous leeches of E. Australia has provided further refinement in the understanding of the nature of the hirudiniform genus, leading to the recognition of this 7-banded species from Victoria as being generically distinct from but having relationship only with two Torresian 7-banded species to be described in the study on speciation, where a new genus will be provided for them.

The two new genera are members of the family Richardsonianidae. In both there is marked elongation of the ejaculatory bulbs and vagina to a cylindroid form, and the vagina U-shaped with two subequal limbs. This parallelism in the form of two different organs on two different regions of the reproductive system, regions which elaborate in two separate processes of morphological differentiation (Richardson 1969), sharply sets apart the two new genera from the other five genera in this family. In these five, the bulbs and vagina remain short, fusiform to sub-ovoid. With this there begins to appear a separation which is more than simply generic in nature.

The former systematic framework for the hirudiniform leeches was a single cosmopolitan family Hirudidae, with all aquatic monostichodonts in a subfamily

[1] This study has been assisted by a grant from the Nuffield Foundation.

[2] 4 Bacon St., Grafton, N.S.W.

Hirudinae and the distichodonts and agnatha in a subfamily Haemopinae (Caballero 1959). The demonstration (Richardson 1969) of hirudiniform families of a regional nature made the above untenable. The need for new sub-familial ranks emerged in that study which was initially concerned with establishing the nature of the hirudiniform genus, but the order for sub-familial differentiation could not then be assessed.

This is the first experience of differences of a sub-familial level inside the new systematic framework. Their nature is shown in the brief summary given below to distinguish the new genus for the Victorian leech. It is sufficient at this time to draw attention to the matter, and to postpone nominating groups at this level until our hirudiniform fauna is more fully explored.

With the exception of the genus *Hirudobdella* Goddard 1910, which stands apart from the following (Richardson 1969), the known hirudiniform leeches of the Australian region are divided between two families. Both are sanguivorous, monostichodont, with a hirudoid pharynx and crop.

F. Ornithobdellidae Richardson, 1969

Median reproductive regions, amyomeric, micromorphic; epididymis and ejaculatory bulb (or sperm duct) differentiated on a primary loop on the anterior region of the paired male ducts, the relationship subparallel; genital pores, xi b_5 b_6 and xii/xiii (xiii b_1 b_2). Pattern, reticulate, lacking, or a single median dorsal dark band. Amphibious (? aquatic). Australian region. gg. *Ornithobdella* Benham 1909, 15 5-annulate somites, etc., 1 species, Snares Islands, New Zealand; *Aetheobdella* Moore 1935, 17 5-annulate somites, etc., E. coastal Australia.

F. Richardsonianidae Richardson, 1969

Median reproductive regions, myomeric; no primary loop on the anterior region of the paired male duct, the epididymis posterior to the ejaculatory bulb, the relationship linear; vagina, caecate; genital pores xi and xii b_5 b_6. Pattern striped, aquatic. Australian region.

The genera in this family separate as follows:

1 (10) Vagina and ejaculatory bulbs fusiform to sub-ovoid, the vagina not U-form with subequal limbs when functionally differentiated.

2 (9) ix to xxiv, 5-annulate (16 complete somites); no salivary gland papillae on the jaws (*'australis'* complex).

3 (8) Median regions, bimyomeric, the male a muscular penis-sheath.

4 (7) Male median region, mesomorphic; vaginal duct long, equal to or longer than the vagina; xxv, 4-annulate; a median and two pairs of dark dorsal longitudinal bands.

5 (6) Pharynx terminates in ix.
g. *Richardsonianus* Soos 1968, four species. Bassian, Eyrean, and New Zealand.

6 (5) Pharynx terminates at viii/ix.
g. *Quantenobdella* Richardson 1969, one species. Lord Howe Island.

7 (4) Male median region, micromorphic; no vaginal duct; xxv, 3-annulate; a median and two pairs of orange-red (preserved, pale) dorsal bands. Pharynx ends, viii/ix.
g. *Eunomobdella* Richardson 1969, one species. Torresian.

8 (3) Median regions, hemimyomeric, the male, micromorphic, an elongate thin-walled atrium. Vaginal duct, short, less than half the length of the vagina. Pharynx ends in ix; xxv, 4-annulate; a median dark, and two pairs of orange-red dorsal bands (preserved, fade completely).
g. *Euranophila* Richardson 1969, one species. Torresian.

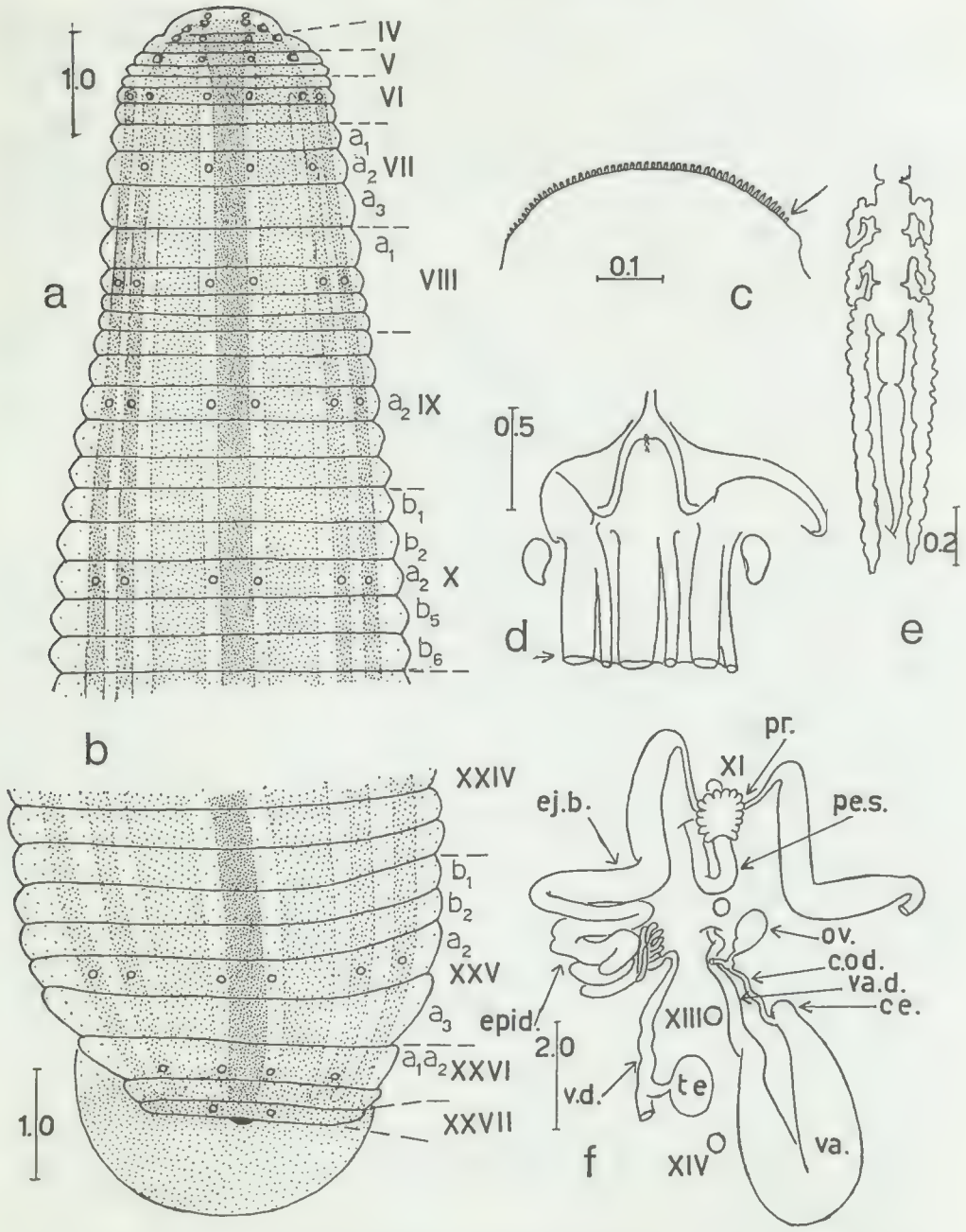

FIG. 1—*Bassianobdella victoriae* gen. et sp. nov. a. Dorsal aspect, somites i to x, and b. somites xxiv a_2 to xxvii and sucker, to show topography of the pattern. c. Jaw and dental ridge (arrow indicates medial end). d. Jaws, and pharynx opened along mid-ventral line to show internal muscular ridges (arrow indicates mid-point in length of pharynx). e. Crop, somites xvii to xix, caecation, and intestine. f. Anterior region of male paired duct (medial aspect shown, dorsal aspect is lateral in the figure); male median region; and female reproductive system.

Somites and somital ganglia indicated by Roman figures; annuli, 'a_2' etc. Abbreviations: c.od. common oviduct, ce. vaginal caecum, ej.b. ejaculatory bulb, epid. epididymus, od. oviduct, ov. ovary, pe.s. penis sheath, pr. prostate, te. testis, va. vagina, va.d. vaginal duct, v.d. vas deferens.

All scales in millimetres. All drawings are from the holotype.

bands along the dorsum; the margins, light, continuous with the immaculate venter.

The length is 45·0 mm; 2·0 mm wide at iv/v; 2·0 mm wide and deep at vii/viii, widening gradually behind this and the depth increasing, to be 3·0 mm wide and deep at x/xi, 6·0 mm from the velum, so that the pregenital region is tapering cylindrical; behind this increasing more in width and depth to be 4·5 mm wide and 3·5 mm deep at xiv, 12·0 mm from the velum; continuing this suboval cross-section back to 40·0 mm with a maximum width of 5·0 mm, then reducing gradually to 2·2 mm at xxvii which forms the base of the deeply cupped sucker which is 2·5 mm in both diameters. The margins are keeled along the posterior quarter of the body.

Colour

Faded; but possibly dark brownish above in life and lighter below. Preserved, only the narrow median black band and the very light margins are obvious; between these pale greyish brown; the three pairs of narrow light stripes, very faint. The posterior half of the dorsum of the sucker is pale grey, darker than the anterior half which is much of the colour of the venter.

Pattern

(Fig. 1a-b)

Preserved, faded, vague, but definitely: the median black band almost filling the median field; the inner pair of narrow light stripes extend along the paramedian line and include these sense organs; a wide pale brownish band fills most of the paramedian field, excepting for the narrow light stripe which completes the lateral part of this field; the inner and outer narrow dark paired bands extend along the intermediate and supramarginal lines of sense organs, include these organs, and are separated by the outer paired narrow light stripe which fills most of the intermediate field.

The margin of the velum is light in colour, continuous with the marginal field (supramarginal + submarginal fields) and the venter. The interocular area on the velum is pale brown, excepting for faint indications of the median black band in iv; behind iv/v, the median black band is well-defined back to xxvi/xxvii, without any indications of this on xxvii and the dorsum of the sucker which are both uniformly dark greyish. The paired narrow light paramedian stripes commence on v a_2, include the paramedians of this annulus, and are continuous of almost uniform width back to xxvi a_1a_2/a_3, and include the paramedians of this somite. The narrow light stripe lateral in the paramedian field commences medial to the 5th eye in vi a_2, is continuous back to xxv/xxvi, vaguely indicated on xxvi, and back to xxvi/xxvii which is probably the actual termination of this stripe which is a little wider along the greater part of the body than at the ends. The two stripes, the paramedian line and lateral in the paramedian field, define the dark band of the paramedian field between the above levels, this band increasing markedly in width along the body as the paramedian field widens, in contrast to the other bands and stripes which are more uniform in width along their length. The narrow paired light stripes of the intermediate fields are faintly indicated at vi/vii, appear to be continuous with the margin of the velum at vi a_2 lateral to the 5th eye, and extend back to xxv/xxvi with indications of them on xxvi back to xxvi/xxvii, but not on xxvii. The lateral light stripe of the paramedian field, the light stripe of the intermediate field, and the light margin define the dark narrow bands along the intermediate and supramarginal lines between the above levels. The termination of the supramarginal band on vi a_2 where it includes the supramarginal sense organ, and the separation of the band at this end from the interocular dark area of the velum, is most unusual.

9 (2) ix to xxiii, 5-annulate (15 complete somites); xxv, 3-annulate; salivary gland papillae on jaws. Pharynx ends at viii/ix; median regions bimyomeric, mesomorphic; no vaginal duct; a median light and two pairs of dark dorsal bands.
g. *Goddardobdella* Richardson 1969, one species. Torresian, Papuan.

10 (1) Vagina and ejaculatory bulbs elongate, cylindroid, the vagina folded lengthwise, U-form with subequal recurrent and procurrent limbs. Somites ix to xxiv, 5-annulate (16 complete somites); xxv, 4-annulate; no salivary gland papillae; a median black and three pairs of dark (preserved, pale) dorsal bands.

11 (12) Common oviduct, long, equal to or longer than the procurrent limb of the vagina; common oviduct closely associated with and extends along the surface of the vaginal duct; pharynx ends in ix. (gen. nov. Two species under description elsewhere. Torresian).

12 (11) Common oviduct, short, about ½ length of procurrent limb of vagina, and not associated with the vaginal duct; pharynx ends viii/ix.
gen. nov. *Bassianobdella*, as follows.

Gen. nov. **Bassianobdella**

Derivation: Bassian = zoogeographic name; bdellos = a leech, f.

Monostichodont; 16 5-annulate somites; xxv, 4-annulate; somital sense organs small; jaws, small; teeth, minute, about 50; no salivary gland papillae; dorsal salivary glands, spaced, sparse, right and left loose clusters, no large columns of aggregated ducts; radial muscles, an obvious extrinsic system; mouth and lumen of pharynx, narrow, the lumen, tubular, tapering; pharynx with six internal muscular ridges, joining as dorsomedian and ventrolateral pairs to enter the jaws, none ending independently between the bases of the jaws; pharynx terminating viii/ix; compartment ix, acaecate, x to xviii each with a single pair of simple caeca median on the compartment and those in xix forming postcaeca extending to xxvi; the compartment on xix fully formed behind the caeca; intestine with a section in xx divided off from the tapering intestine; genital pores, xi b_5/b_6 and xii b_5/b_6; testes, normally 10 pairs; anterior region of male paired duct without a primary loop, epididymis in contiguous halves of xii and xiii and posterior to the elongate cylindrical ejaculatory bulb folding on itself in the contiguous halves of xi and xii; bulbs without cornua; median regions, bimyomeric, mesomorphic; penis, sheath, cylindrical, reflected; oviducts, short; common oviduct longer than oviducts but much shorter than the recurrent limb of the U-form vagina; vaginal duct of the length of the procurrent limb; common oviduct not associated with the vaginal duct.

Size medium, pattern striped, aquatic, sanguivorous. Australian region (Bassian).

Type species: *Bassianobdella victoriae* sp. nov.

Type specimens in National Museum of Victoria, Melbourne.

Holotype G839 45·0 mm long from Thornton, Goulburn Valley, Victoria, 12 April 1904. Donated G. E. Nichols.

Paratype G1510 34·0 mm long, same locality and donor.

Bassianobdella victoriae sp. nov.

(Fig. 1a-f)

A leech of medium size; the dorsum with a narrow median black band, wider than the three pairs of light stripes which divide the dorsum into a wider pair of inner dark longitudinal bands, and narrow intermediate and lateral paired dark bands which are of the width of the light stripes, so that there are seven dark

Annulation

(Fig. 1a-b)

The intersomital and interannular furrows are well-defined, equivalent, and without regular indications of division of the body into true somites; in the genital and post-genital regions, a_2 is occasionally dorsally, commonly ventrally, distinctly longer, giving the appearance of longer singles dividing off shorter annuli as quadruplets. Somital sense organs, small, mostly detectable, often with some difficulty, and commonly the full series cannot be detected across the annulus. Somital sensillae, minute, pointed, obscure. Nephropores small, ventral.

The margin of the velum shows a distinct pair of paramedians anterior to the 1st eyes. The first furrow, iii/iv, extends across the velum between the 2nd and 3rd pair of eyes, but not onto the margin of the velum; iv, 2-annulate, a_1a_2 (with the 3rd pair of eyes and obvious paramedians)—a_3, the furrow a_1a_2/a_3 ending in the intermediate line, and the dorsolateral lobe of the margin of the sucker is not strongly defined anteriorly; v, 2-annulate above, the 4th eyes and the paramedians in $a_1a_2 > a_3$, the furrow a_1a_2/a_3 extending into the submarginal field so that a_1a_2 forms the lateral margin of the sucker and uniannulate v, the ventral margin; vi, 3-annulate above $a_1 < a_2 < a_3$, the 5th pair of eyes, paramedians and supramarginals in a_2, the furrow a_1/a_2 reaching into the submarginal field, and vi, 2-annulate ventrally; vii, 3-annulate above and below, $a_1 < a_2 < a_3$ ($a_3 =$ viii a_1); viii, 4-annulate, $a_1 > a_2 > b_5 = b_6$, the first nephropores on a_1; ix, 5-annulate, $b_1 < b_2 < a_2 < b_5 > b_6$; ix to xxiv, 5-annulate, complete (total, 16); x, $b_1 < b_2 = a_2 > b_5 = b_6$; the relative lengths of the annuli in the somites behind x are variable, some all subequal, in others a_2 distinctly longer and in these $b_1 = b_2 < a_2 > b_5 = b_6$; xxiv, 5-annulate, $b_1 = b_2 > a_2 > b_5 = b_6$, the last nephropore on b_2 just medial to the intermediate line; xxv, 4-annulate, $b_1 = b_2 < a_2 < a_3$, and a_3 the last annulus complete on the venter; xxvi, 2-annulate, $a_1a_2 > a_3$, the somital sense organs posterior in a_1a_2; the furrow xxvi/xxvii, weaker but complete in the median field; xxvii, uniannulate; the anus at the posterior border of xxvii.

No annulation or somital sense organs are detectable on the dorsum of the sucker which is slightly eroded as though the animal had been killed in hot water.

Alimentary Tract

(Fig. 1c-e)

Jaws, small, compressed, slightly taller (0·4 mm) than wide (0·3 mm) across the base; housed in deep grooves with poorly defined margins; the dental ridge, low convex; the teeth, about 50, minute, at the median end 30 microns high, the row diminishing very gradually in height so that the teeth in the middle of the row are about 22·0 microns high, reducing from about the thirtieth tooth to be 15 microns or less at the outer end. No salivary gland papillae.

The mouth and lumen of the pharynx, narrow, the mouth little wider than the base of the dorsomedian jaw, the lumen tubular, tapering; internal muscular ridges, 6, alternating wide and narrow, one of each joining close to and entering the base of the jaw; none ending independently between the bases of the jaws.

Salivary glands, sparse, poorly defined right and left dorsal masses; no obvious thick cords of aggregated ducts. Radial muscles, an obvious extrinsic system extending back into the anterior part of x.

The pharynx, short, commencing at vii/viii and terminating at viii/ix. (In the type, the crop is narrowly tubular from ix to xii, without compartmentation or caecation, an artefact condition found in leeches killed in hot water, v. Richardson, 1969. The Cranbourne specimen shows a full compartment in ix; x to xii, each with a single pair of simple caeca median on the compartment, the caeca progressively longer and folding on themselves in xiii and xiv.) In the type, a simple

pair of median primary caeca on xiv, each folded on itself in the paramedian chamber; the caeca progressively longer in xv to xviii, extending into the following somite, folded; the compartment in xix, complete anterior and posterior to the median caeca which form postcaeca extending into xxvi. The intestine commences with a defined chamber in xx, followed by the tapering intestine. Dissection was not taken to the level of the rectum.

Reproductive System

(Fig. 1f)

The indications are that the specimen is fully male mature.

The genital pores are at xi b_5/b_6 and xii b_5/b_6. The tip of the penis shows as very narrow, cylindrical. The testes, simple, saccular, the first at xiii/xiv, the last at xxii/xxiii, total 10 pairs (11 in the Cranbourne specimen). The vasa deferentia run in the paramedian longitudinal chambers of the body cavity, each tapering in xiii, folding tortuously as the wider epididymis in the contiguous halves of xiii and xii, expanding into a much wider portion folding on itself in xii and xiii, this connecting by a thin-walled narrower short portion to the dorsal end of the elongate cylindrical ejaculatory bulb which has a descending vertical limb in xii and a sub-horizontal limb in xi; the bulbs taper very briefly at each end and are without distinct cornua. Accordingly, there is no primary loop on the anterior region of the paired male ducts; the epididymis, essentially posterior to the ejaculatory bulb; the two in a linear relationship.

A short thin-walled ejaculatory duct connects the anterior end of the bulb to the muscular atrium which is close behind g. ix, continuous with a narrower cylindrical elongate penis sheath reflecting on itself just anterior to g. xii, terminating at the genital pore. The male median region is myomeric, mesomorphic.

The saccular ovaries are in the posterior annuli of xii, connected by thin-walled oviducts, shorter than the ovaries, to the small atrium at xii/xiii; the common oviduct, slightly thicker-walled, weakly muscular, with a relatively large lumen, is much longer than the oviducts, but no more than half the length of the recurrent limb of the vagina, and extends loosely folded between the atrium and the caecate end of the vagina, independently, without association with either the vagina or the vaginal duct. The common oviduct joins the vagina subterminally lateral to g. xiii; the vagina caecate, the caecum, small, the whole muscular, elongate, cylindroid, folded on itself in the contiguous halves of xiv and xv, into subequal recurrent and procurrent limbs, the procurrent limb tapering in the posterior half of xiii to merge gradually into the more muscular folded vaginal duct which is a relatively short, not as strongly muscular as a typical duct, thinner-walled and with a relatively larger lumen than usual. The female median region is myomeric, mesomorphic, caecate with a duct, and the whole system ventral to the crop.

The prostate glands are a large mass covering the atrium and extending along the ejaculatory ducts. The albumin glands invest and conceal the atrium and the full length of the common oviduct.

Other material: One specimen, 22·0 mm long, Cranbourne. Victoria, coll. W. D. Williams, no date. Deposited Australian Museum, Sydney, Coll. No. W4196.

Comparative Morphology of the Female Median Region

This region is well-advanced in functional differentiation in the type of *B. victoriae*; somewhat more so in the paratype where the vagina is markedly increased in diameter and the wall relatively thinned. In both, there is not the usual abrupt transition from vagina to vaginal duct as seen in leeches having a fusiform to sub-ovoid vagina: the wall of the vagina relatively thin but muscular, the lumen, large; the vaginal duct, thick-walled, strongly muscularized, the lumen greatly

reduced; and the vagina and duct sharply distinct morphologically. Instead, in *B. victoriae*, the procurrent limb of the vagina tapers, reducing rather gradually in diameter, the wall remaining thin, the lumen reducing proportionately; so that the terminal portion which has the appearance of a duct, still has the wall thinner and the lumen larger, than is usual. In the two Torresian species with the U-form vagina, the terminal portion is more strongly muscularized, quite readily recognized as a vaginal duct, the division between vagina and duct quite sharply defined in the fully differentiated region, and the common oviduct is elongated and extends along the face of the vaginal duct; but in the Victorian leech, the common oviduct lies loosely tortuous between the atrium and the caecate end of the vagina, and is remote from and shorter than the duct.

In myomeric leeches with a caecate vagina, the female median region differentiates morphologically as a posteriorly directed primary loop; the recurrent limb forming the non-muscularized common oviduct, elongating in morphological differentiation to fold loosely between the atrium and the caecate end of the muscularized portion of the vagina which forms on the posterior part of the recurrent limb, the procurrent limb forming the vaginal duct; or in those without a vaginal duct, the vagina extends along the procurrent limb, so that at this stage it is folded on itself as two subequal limbs, the whole ventral to the crop (e.g. *H. medicinalis* v. Richardson 1969, Fig. 1A). In those without a duct, the vagina straightens during early functional differentiation to become subfusiform and stand more or less erect lateral to the crop (v. *Goddardobdella*, Fig. 2D; *Eunomobdella*, 2E), or extends posteriorly lateral to the crop (v. *Haemopis* s.s., 3C; *Bdellarogativa*, 4A); but in all without a duct, the common oviduct elongates with the vagina, runs closely adherent to the wall of the simple vagina, and is of the length of the vagina.

In those with a caecate vagina and a vaginal duct, on the evidence of the Australian leeches, the condition towards the end of morphological differentiation is much as in those without a duct, the common oviduct loosely folded between the atrium and the caecate end of the vagina, and without association with either the vagina or the duct (v. *Richardsonianus*, Fig. 2A); the whole ventral to the crop. Growth in early functional differentiation is greater on the vaginal duct than on the vagina, the duct extending lengthwise and carrying the end of the vagina posteriorly, the body of the vagina becoming sub-erect lateral to the crop in mesomorphic forms (v. *Quantenobdella*, 2B; *Euranophila*, 2C); or elongate lateral to the crop in the macromorphic form (v. *Mollibdella*, 3D); or both the duct and vagina lateral to the crop in the megamorphic form (v. *Percymoorensis*, 4B); but in all with a duct, the common oviduct elongates and extends along the face of the vaginal duct and has no relationship with the wall of the vagina.

In the Torresian genus, the common oviduct is nearly equal in length or longer than the recurrent limb of the vagina and much of the length of the vaginal duct. It extends along the face of the duct to reach the caecate end of the vagina. The regional relationships of the common oviduct are those typical of leeches having a caecate vagina and a vaginal duct.

In *B. victoriae*, the common oviduct remains relatively short without elongation in functional differentiation although the duct elongates to become folded on itself. The common oviduct does not become closely associated with the vaginal duct; but retains the relationships achieved at the end of morphological differentiation unaltered in functional differentiation.

The persistence of the relationships of the common oviduct as achieved in morphological differentiation, the lack of the usual strongly muscularized wall and the presence of a relatively large lumen in the duct with the associated lack of sharp morphological distinction between the vagina and the duct, together indicate

some measure of failure in the usual organogenic processes elaborating these structures on the primary loop. With only the facilities of hand dissection, the evidence is that the 'duct' has more the nature of a 'vestigial' structure or 'pseudo-duct', and might more correctly be referred to in some such term rather than as a vaginal duct; but this can be decided only from the study of sections.

Acknowledgements

I am most grateful to the Director of the National Museum of Victoria and to Dr B. J. Smith, Curator of Invertebrates, for the privilege of studying leeches in the collection of the Museum; to the Librarian, the University of New England, to Dr J. C. Yaldwyn now of the Dominion Museum, New Zealand, and to Dr R. E. Barwick of the Australian National University, for assistance with literature, as also to Professor Marvin C. Meyer of the University of Maine, for assistance with difficult literature consulted in the course of this study. The Science and Industry Endowment Fund has assisted with the loan of microscopic and other equipment.

References

Becker, L., 1859. A few notes on two kinds of Australian leeches. *Trans. phil. Inst. Vict.* 3: 36-38.

Bosisto, J., 1859. On the *Hirudo australis*. *Trans. phil. Inst. Vict.* 3: 18-22.

Caballero, E., 1959. Hirudineos de Mexico. xx. Taxa y nomenclatura de la Classe Hirudinea hasta generos. (n. ed.). *Anal. Inst. Biol. Mexico* 30 (1-2): 227-242.

Richardson, L. R., 1969. A contribution to the systematics of the hirudinid leeches with description of new families, genera, and species. *Acta Zool. Acad. Sci. Hungar.* 15 (1-2): 97-149.

TWO REMARKABLE *STENUS* FROM NEW GUINEA (COLEOPTERA: STAPHYLINIDAE)*

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The holotype of *S. cribricollis* Lea and a very remarkable new species of *Stenus* are described. The re-description of *S. cribricollis* is necessary because there are many New Guinea species very similar to *cribricollis* in their general shape. The sexual characters are also described.

Stenus cribricollis Lea, 1931

Stenus cribricollis Lea 1931, *Rec. S. Aust. Mus.* 4: 366.

Male (after type): 4th sternite broadly impressed apically, impression convergent and shallowed anteriorly, with a nearly extinct punctation, at posterior margin broadly and very shallowly emarginated. 5th sternite with a broad and deep impression in posterior half having a shallow and not dense punctation, sides of impression posteriorly elevated but not carinated with a dense whitish pubescence. 6th sternite has a very broad and deep impression which is narrowed anteriorly, sides of impression posteriorly carinated, ending in a strong tooth, which does not extend beyond the posterior margin of sternite (lateral aspect), well separated from it by a deep concave sinus, inner sides of the carinae extremely densely whitish pubescent, posterior margin of sternite shallowly and broadly emarginated. 7th sternite slightly shallowed along the middle, finer and twice as densely punctated and pubescent than on the sides, at posterior margin very shallowly and moderately broadly emarginated. 8th sternite (Fig. 2). 9th sternite broadly rounded at posterior margin and sawed. 10th tergite broadly rounded. Aedeagus (Fig. 1) long and slender, median lobe acuted into a long and slender spine-like apex, which looks like a tooth in lateral aspect. In proportion to the basal portion the apical portion of median lobe is very short, showing two lateral carinae and between them a nearly circular pit. Inside there are longitudinal expulsion-bands, strongly sclerotized expulsion-mechanisms, and a long tubous internal sac. Parameres well extending beyond the median lobe, triangularly enlarged apically with many moderately long setae.

Measurements: Length of body: 8·00 mm (not 9).

Width of head: 1275μ, average distance between eyes: 750μ, width of prothorax: 887μ, length of prothorax: 1326μ, width of elytra: 1276μ, length of elytra: 1676μ, length of suture: 1427μ, posterior tarsi: 350—163—175—175—275μ.

The whole abdomen is distinctly but shallowly reticulated.

Stenus (Hypostenus) thalassinus n. sp.

This new *Stenus* belongs to a species-group which must be placed (after definition) into the subgenus *Hypostenus* (also *bucephalus* Benick from the Moluccas) but phylogenetically is intermediate between *Hypostenus* and *Parastenus* (com-

* 68th contribution to the knowledge of Steninae.

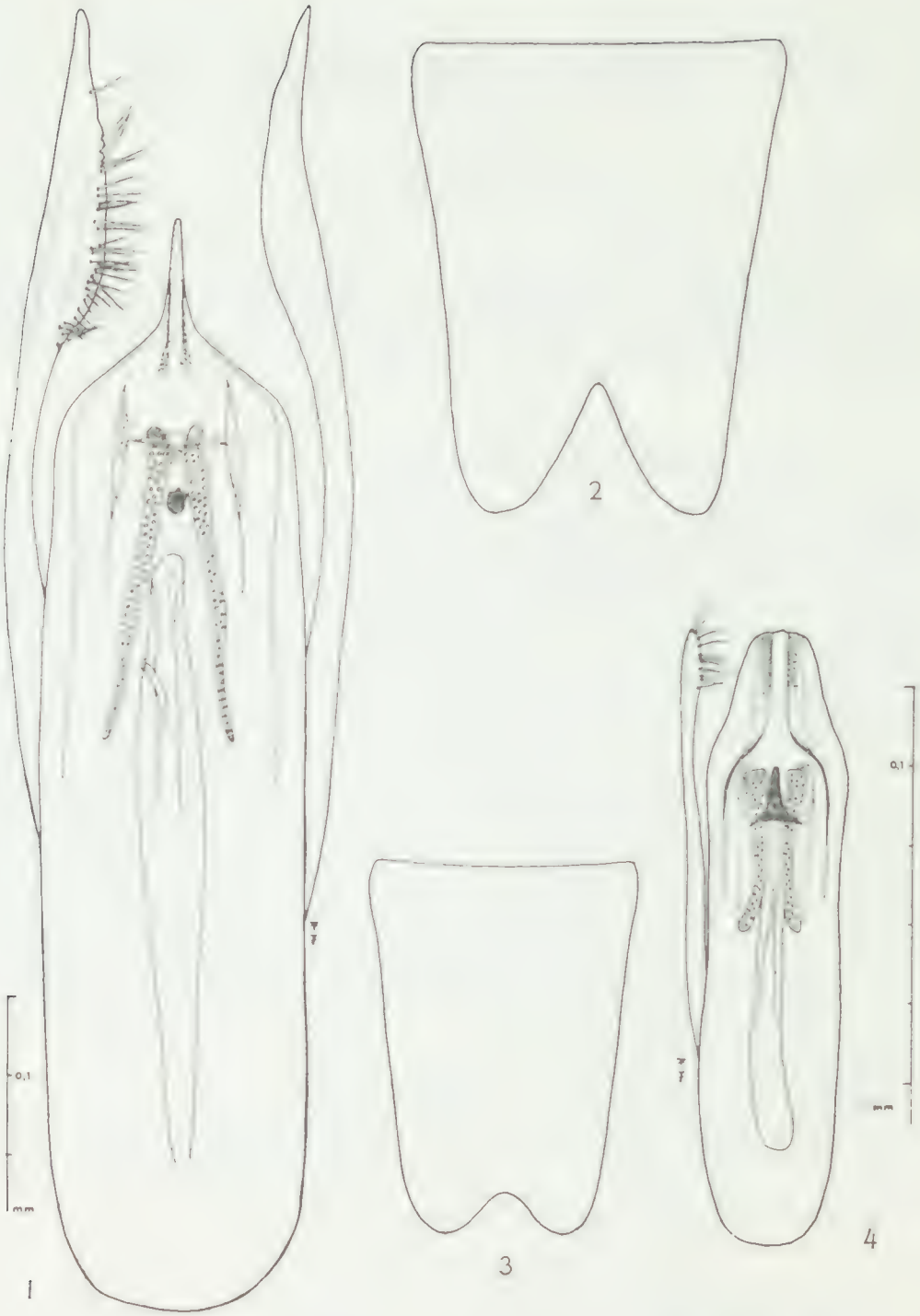

FIG. 1—*Stenus (Hypostenus) cribricollis* Lea (holotype), ventral aspect of aedeagus, right paramere without setae.
FIG. 2—*Stenus cribricollis* Lea. 8th sternite of male.
FIG. 3—*Stenus (Hypostenus) thalassinus* n. sp. (holotype), 8th sternite of male.
FIG. 4—*Stenus (Hypostenus) thalassinus* n. sp. (holotype), ventral aspect of aedeagus, without right paramere.

pare *magnificus* Benick from New Guinea). It is very remarkable for its sea-green colour and its very coarse and close punctation of the whole body.

Sea-green with a somewhat blue tint, shining, very coarsely and closely, somewhat rugosely punctated, very shortly pubescent. Antennae yellow with the club slightly infuscated. Palpi yellow. Legs yellow, the knee-portion of femora infuscated. Labrum yellowish-brown.

Length: 4·7-5·3 mm.

♂—holotype and ♀—paratype: New Guinea: Wareo, Finschaven, trapped by sticky seeds of *Pisonia,* Rev. L. Wagner leg.

Head distinctly broader than elytra (987:826μ), front moderately narrow (average distance between eyes: 663μ), having shallow longitudinal furrows, median portion distinctly broader than each of the side-portions, only somewhat elevated, not extending to the level of inner eye-margins. Punctation all over coarse and close, diameter of puncture fully as large as apical section of 3rd antennal segment, interspaces smaller than half a puncture.

Antennae moderately slender, when reflexed distinctly not extending to the posterior margin of pronotum, penultimate segments about twice as long as broad. Prothorax distinctly longer than broad (876:663μ), sides nearly straight. Punctation very coarse and dense, sometimes transversely confluent, interspaces smaller than half a puncture.

Elytra short and narrow, distinctly narrower than head (826:987μ), slightly longer than broad (837:826μ), sides behind narrow shoulders distinctly and straightly dilated posteriorly, broadest in posterior sixth, afterwards retraced, hind margin deeply emarginated (length of suture: 588μ). No sutural, and no humeral impression. Punctation throughout about as on pronotum, diameter of a puncture about as large as section of 2nd antennal segment.

The nearly cylindrical abdomen is slightly narrowed posteriorly, basal restrictions of first segments deep, 7th tergite with a narrow, rudimentally membranous fringe apically. Punctation all over very coarse and dense, only on tergite 10 sparser and finer. This tergite in both sexes is remarkably acute towards apex.

Legs moderately slender, posterior tarsi nearly as long as two-thirds of tibiae, 1st segment nearly as long as the 3 following together, distinctly longer than the last joint: 298—127—102—119—170μ, 2nd to 4th segment bilobed.

Microsculpture lacking except on the head.

Male: legs lacking special characters. Anterior sternites very coarsely and densely punctated. 7th sternite near posterior margin finely and sparsely punctated. 8th sternite (Fig. 3). 9th sternite with a large lateral tooth on each side apically, concave between them.

Aedeagus (Fig. 4) with a broad apex of median lobe, which is weakly sclerotized in the middle of its apical portion, having numerous papillae on each side. Inside there are longitudinal expulsion-bands, a strongly sclerotized expulsion clasp which is apically acuted, and a tubous internal sac. Parameres slender, slightly extending beyond median lobe. Female: 8th sternite roundly acuted towards apex of posterior margin. Valvifera narrowed into a strong tooth apicolaterally.

Stenus thalassinus n. sp. resembles somewhat *S. bucephalus* Bck. from Buru and even more closely *S. magnificus* Bck. from New Guinea, from which it is at once distinguished by its very coarse and dense punctation of the whole body. *Stenus magnificus* should be its sister-species (sensu Hennig 1965).

Holotype in the South Australian Museum, Adelaide; paratype in my collection. I am indebted to Mr G. F. Gross for the loan of specimens.

References

BENICK, L., 1925. Fauna Buruana. Der erste *Stenus* (Latr.) von den Molukken (Col. Staph). *Treubia* 7: 11-13.

————, 1926. Neue Megalopsidiinen und Steninen, vorwiegend aus dem Zoologischen Museum in Hamburg (Col.). *Ent. Mitt.* 15: 262-279.

HENNIG, W., 1965. Phylogenetic Systematics. *A. Rev. Ent.* 10: 97-116.

LEA, A. M., 1931. Australasian Coleoptera. *Rec. S. Aust. Mus.* 4: 365-408.

REVISION OF THE AUSTRALIAN SPECIES OF THE GENUS *STENUS* LATREILLE (COLEOPTERA; STAPHYLINIDAE)*

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Abstract

A revision of all Australian *Stenus* species hitherto described (20 species, 1 syn. nov.), including lectotypology of the Macleay species, and diagnoses of six new species are given. Phylogenetic analysis shows that there are seven species groups in Australia, four of them monophyletic and the other three not clear at present. One group (containing most of the species) is Australian, three Oriental, and three Papuan. Pleistocene land connection between New Guinea and Queensland explains the high number of species and species groups in NE. Australia, and the occurrence of three taxa common to Papua and Queensland.

Introduction

The staphylinid genus *Stenus* Latr. is one of the largest genera of the world (about 1400 described species). It is distributed over nearly all the world except (apparently) New Zealand—a striking fact already noted by Fauvel (1903). Occurrence of *Stenus* in Tasmania is not known at present but highly probable.

The first *Stenus* species from Australia were described by Macleay (1871), who gave very short diagnoses without subgeneric subdivisions. Fauvel (1877, 1878) redescribed most of those species from original material, arranged them in subgenera, and described new species. The other taxa were published by Waterhouse (1877), Blackburn (1891), Lea (1899), and Benick (1926, 1928); total number 23. My revision is based on the types and other material of most of the Australian and European museums, which provided 600 specimens for study. If there is any material in a collection not revised by me, I would be glad to get it for study.

The type of only one species (*viridiaeneus* Macleay) has not been found in any of the collections quoted below.

1. The *cupreipennis*-group in defined by characters of the last abdominal segments, aedeagus, short and cordiform prothorax, and the concave front. Species of that group are also known from New Guinea (*prismalis* Fauvel, *illiesi* Puthz), New Britain (*dahli* L. Benick), and the Solomons (*aphrodite* Puthz, *aglaia* Puthz). Because at present I do not know definite relations to Oriental species groups I assume that this group is an autochthonous-Australian group.
2. *cursorius*-group (1 species *cursorius* L. Benick 2·6%)
   The monophyletic *cursorius*-group (sister-group: the Oriental *simulans*-group) is an Indo-African group (cf. Puthz in press a). *Stenus cursorius* is euryoecous and also known from Timor and New Guinea. It might have invaded the northern parts of Australia over the land connections during the last glacial period or by active dispersal later.
3. *piliferus*-group (3 taxa 7·8%, *piliferus, obesulus, hornensis, gayndahensis*)
   This is also a monophyletic group, well defined by the last abdominal segments, aedeagus, short pronotum, and shining plaques on head and/or pronotum. Most of the taxa are distributed over the Oriental Region, some invaded Australia. *Stenus gayndahensis* should be regarded as a relatively young species because of its remarkable characters of the 9th sternite/valvifera (apomorphic).

* 72nd contribution to the knowledge of Steninae.

4. *coelestis*-group (2 species 5·2%, *pseudocoeruleus, improbus*)
   This group (monophyletic ?) has most of its species in the Papuan subregion. In Australia it is only found in Queensland and New South Wales where it must have come during the last glacial period.
5. *platythrix*-group (1 species 2·6%)
   Relatives in New Guinea, certainly also derived from the Papuan fauna.
6. *coeruleus*-group (1 species 2·6%), also phylogenetically belonging to the Papuan fauna. Sister-species *hestiocorus* Puthz living in New Britain and Manus Island.
7. *guttulifer*-group (4 species 10·5%, *guttulifer, bifenestratus, maculatus, pustulifer*)
   This group contains the 4 Australian *Parastenus*. It is well characterized by the spermatheca of the female and the aedeagus. Close relatives are found in New Guinea (*thalassinus* Puthz, *magnificus* L. Benick, *gigas* L. Benick), other relatives: the Oriental *guttalis*-group (compare internal sac Puthz 1968). This species must be regarded as species incertae sedis. Two of the total number of described taxa have been synonymized by me previously (1968e, in press), one new synonymy is given here, and six new species are described below. Thus the present number of Australian *Stenus* species and subspecies is 26.

Compared with other tropical faunas, that of Australia is very poor (Africa and Madagascar 255, South America 279, Oriental Region 340), a fact which is understandable for ecologic and phylogenetic reasons. Most of the *Stenus* species need a high degree of humidity; they are ripicolous near creeks and lakes, and also humicolous (cryptic) in forests, only a very small number living in subhumid and semiarid climates.

Regarding the distribution of the Australian species (see map), nearly all live in areas with a yearly rainfall over 20 inches, most in places where the humidity is high.

The distribution of the 26 known taxa in Australia is: 22 in Queensland (85%), 12 in New South Wales (46%), 6 in Victoria (23%), 6 in W. Australia (23%), 3 in Perth (12%), 2 (+ 1, *villosiventris* ?) in Kimberley (12%), 2 in S. Australia (8%), 1 in the N. Territory (4%), 20 taxa have been found only in E. Australia (77%), 3 only in W. Australia (12%), 3 occur in E. and W. Australia (12%), and 3 live also in New Guinea (12%).

Thus Queensland has the highest number of taxa. This fact can be explained by phylogenetic analysis (and ecological reasons), which shows that there are seven phylogenetic groups in Australia of which at least four are monophyletic:

1. *cupreipennis*-group (13 + 1 species: *cupreipennis, puncticollis, janthinipennis, olivaceus, retitogatus, atrovirens, macellus, convexiusculus, leai, caviceps, villosiventris, neboissi, australicus* + *viridiaeneus* (?))

This is the largest group (36%), although monophyletic their species belong (according to definition) to two subgenera: *Stenus* s. str. and *Tesnus* Rey, which shows that our present subgeneric divisions do not agree with phylogenetic relationship, but are only helpful for identification (Puthz 1967, 1968). Certainly this group is also phylogenetically derived from the Oriental stock. Because of its distribution over Western Australia and the high degree of differentiation connections to the Oriental stem must have been broken in the Tertiary. The two species *maculatus* and *pustulifer* seem to be ecological vicariants.

Summarizing, it is evident that most of the groups are of Oriental or Papuan, i.e. extra-Australian, origin and that most of them occur in the NE. part of Australia, where rain forest is to be found. The 'strong inter-mixing of Papuan elements' is well known from this part of Australia (Hedley 1894, Troughton

1959, Gressitt 1961), the fauna of which has been characterized as 'atypical for Australia' by Toxopeus (1950).

My thanks are due to Dr L. Benick (Lübeck), Dr E. B. Britton (Div. Entomology, CSIRO, Canberra), Mr E. Dahms (Queensland Museum, Brisbane), Mr M. G. Fagel (Institut Royal des Sciences Naturelles de Belgique, Brússels), Mr R. Gaedike (Deutsches Entomologisches Institut, Eberswalde), Prof. J. L. Gressitt (Bishop Museum, Honolulu), Mr G. F. Gross (S. Australian Museum, Adelaide), Mr P. M. Hammond (British Museum Nat. Hist., London), Dr L. H. Herman (American Museum of Natural History, New York), Dr Fr Hieke (Zoologisches Museum, Berlin), Mr C. F. H. Jenkins (Dept. of Agriculture, S. Perth), Dr Z. Kaszab (Ungarisches Nationalmuseum, Budapest), Mr L. E. Koch (W. Australian Museum, Perth), Dr J. F. Lawrence (Museum of Comparative Zoology, Harvard University), Dr H. B. Leech (California Academy of Sciences, San Francisco), Mr G. B. Monteith (University of Queensland Museum, St. Lucia, Brisbane), Mr A. Neboiss (National Museum of Victoria, Melbourne), Dr P. I. Persson (Naturhistorisk Riksmuseet, Stockholm), Prof. Dr O. Scheerpeltz (Wien), Dr P. Stanbury (Macleay Museum, Sydney), Dr R. zur Strassen (Senckenberg-Museum, Frankfurt am Main), and Dr T. E. Woodward (University of Queensland Museum, Brisbane).

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Abbreviations

BM = British Museum Natural History, London.
BMH = Bishop Museum, Honolulu.
CAS = California Academy of Sciences, San Francisco.
DASP = Department of Agriculture, S. Perth.
DEI = Deutsches Entomologisches Institut, Eberswalde.
MCZH = Museum of Comparative Zoology, Harvard University.
MLM = Macleay Museum, Sydney.
NMV = National Museum of Victoria, Melbourne.
QM = Queensland Museum, Brisbane.
SAM = S. Australian Museum, Adelaide.
SMF = Senckenberg-Museum, Frankfurt am Main.
UMQ = University of Queensland Museum, Brisbane.
WAMP = W. Australian Museum, Perth.
ZMB = Zoologisches Museum, Berlin.

1. **Stenus (s. str.) cupreipennis** Macleay, 1871

Stenus cupreipennis Macleay 1871, *Trans. Ent. Soc. N.S.W.* 2(2): 148
Stenus cupreipennis, Fauvel 1877, *Ann. Mus. Civ. Stor. Nat. Genova* 10: 209.
Stenus cupreipennis, Fauvel, 1878, *l.c.* 13: 502
Stenus cupreipennis, Lea, 1899, *Proc. Linn. Soc. N.S.W.* 23: 545.
Stenus cupreipennis, Scheerpeltz, 1935, *Rev. Suisse Zool.* 42: 652.

This remarkable species was found in numerous collections confounded with *S. puncticollis* Macleay, from which it is distinguished by its nearly smooth pronotum, differently emarginated 6th and 8th sternite of male and the aedeagus, of which the median lobe is somewhat broader than in *puncticollis* and the parameres which do not extend the median lobe.

♂ 7th sternite with a broad and deep emargination in posterior 7th of which the sides are somewhat elevated showing many whitish setae. 8th sternite with a narrow,

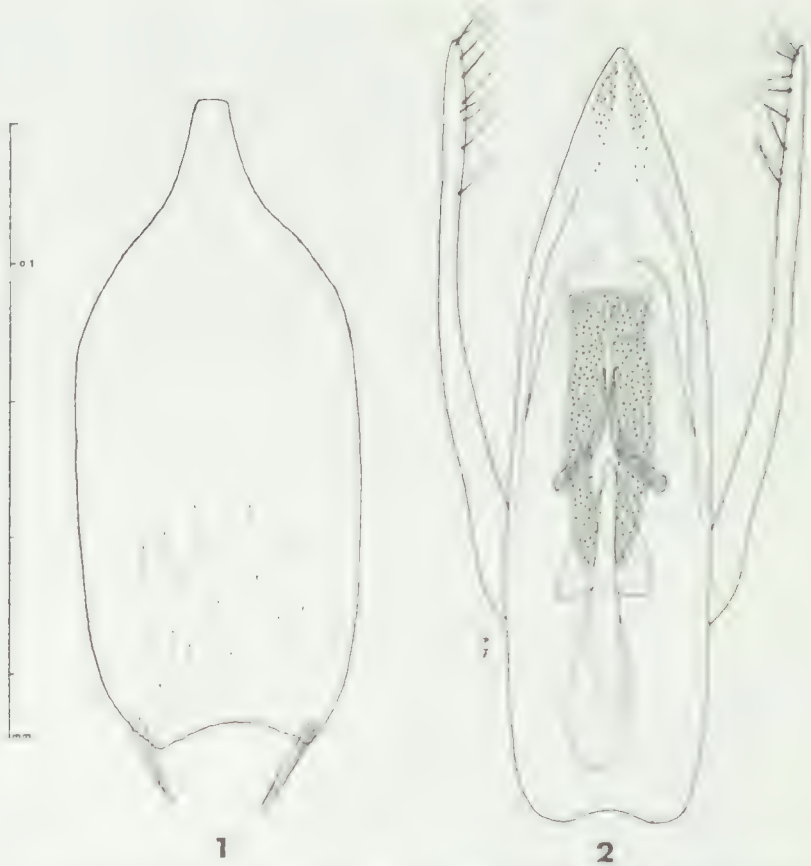

Fig. 1, 2—*Stenus cupreipennis* Macleay (Qld). 1: 9th sternite of ♂. 2: Ventral aspect of aedeagus.

moderately deep, triangular excision in posterior 12th. 9th sternite (fig. 1). Aedeagus (fig. 2).

Length of body: 4·0–4·8 mm.

Material examined: 2 ♂♂, 2 ♀♀ syntypes from Gayndah on two cards, ♂ lectotype, 1 *Stenus cupreipennis* Macl., Gayndah; 2 ♂ lectotype right/Puthz 1969; 3 ♀ paralectotype left/ Puthz 1969; 4 *Stenus cupreipennis* Macleay V. Puthz vid. 1969. Right antenna and right middle and posterior legs partly damaged. 2 ♀♀ –PLT ibid.; S.A.: 1 ♂ Adelaide (coll. Scheerpeltz); V: 1 ♂, 3 ♀♀ Mulgrave R., Hacker (DEI, coll. Benick); 2 ♂♂, 1 ♀ Goulburn R., Kerrisdale (NMV); 2 ♂♂ Kerrisdale (coll.m.); 2 ♂♂, 2 ♀♀ Eltham, Oke (NMV); 1 ♂, 5 ♀♀ Mooroopna, F. E. Wilson (NMV, SAM); 1 ♀ Warburton, Oke (NMV); 2 ♀♀ Melbourne, E. Fischer (NMV); 1 ♂, 2 ♀♀ Diamond Creek, Eltham, Dixon (NMV); Qld: 7 ♂♂, 2 ♀♀ Queensland (SMF, NMV, SAM, coll.m.); 2 ♂♂, 2 ♀♀ N. Queensland (QM); 3 ♂♂, 2 ♀♀ Gayndah (coll. Benick, coll. Fauvel); 1 ♀ Bundaberg, Moller (UMQ); 1 ♂ Gympie, Mooney (UMQ); 1 ♂, 1 ♀ Maryborough, in flood debris, E. W. Fischer (coll. Scheerpeltz); N.S.W.: 1 ♂, 5 ♀♀ Cairns, Hacker (UMQ); N.S.W.: 1 ♂ Narromine, Ferguson (CSIRO); 3 ♂♂, 2 ♀♀ Australia (NMV, coll.m.).

Distribution: S.A., V, N.S.W., Qld, ripicolous at creeks etc.

2. **Stenus (s. str.) puncticollis** Macleay, 1871

Stenus puncticollis Macleay 1871, *Trans. Ent. Soc. N.S.W.* 2(2): 149.
Stenus puncticollis, Fauvel, 1877, *Ann. Mus. Civ. Stor. Nat. Genova* 10: 209 f.
Stenus puncticollis, Fauvel, 1878, *l.c.* 13: 502 f.

♂ Ventral characters of abdomen about as in *cupreipennis*, but the 7th sternite with an apical emargination in posterior tenth, the emargination of sternite 8 less triangular, in posterior thirteenth. Aedeagus with a narrower median lobe than in *cupreipennis* and parameres which extend distinctly but moderately beyond the median lobe.

Length of body: 4·2–4·4 mm.

Material examined: 2 ♂♂ syntypes on one card from Gayndah ♂ lectotype, 1 *Stenus puncticollis*, Macl., Gayndah; 2 ♂ lectotype right/Puthz 1969; 3 ♂ Paralectotype left/Puthz 1969; 4 *Stenus puncticollis* Macleay vid. V. Puthz 1969. The lectotype is intact, the paralectotype has the abdomen, partly damaged by *Anthrenus*.

V: 1 ♀ Victoria (coll. Fauvel); 2 ♂♂, 6 ♀♀ Ringwood, Pottenger, Wilson (QM, NMV, coll.m.); 2 ♂♂, 1 ♀ Diamond Creek, Dixon (CSIRO); 1 ♂ Eltham, Oke (UMQ); 2 ♂♂ Beechworth, Oke (NMV); 3 ♂♂, 2 ♀♀ Belmore, Taylor, Carter (NMV); 1 ♂, 3 ♀♀ Caulfield, Oke (NMV); 1 ♂, 2 ♀♀ Mts. Vic., French, Blackburn (NMV, SAM); 1 ♀ Healsville (NMV); 1 ♂ Melbourne (NMV); N.S.W.: 1 ♂, 1 ♀ N.S.W. (American Museum of Natural History, New York); 1 ♂ Sydney (coll. Fauvel); 1 ♂, 1 ♀ Brisbane, Hacker, Carter (QM, NMV); 1 ♂, 1 ♀ Valleys near Blackheath, Blue Mts., 3000 ft, Darlington (MCZH); 1 ♂ Yerranderie (CSIRO); 1 ♀ Cumberland, Rye (coll. Steel); 1 ♀ Sandgate, F. Muir (BMH). Qld: 2 ♂♂, 1 ♀ Cairns (CSIRO, coll. Scheerpeltz).

Distribution: V, N.S.W., Qld together with *cupreipennis*, ripicolous at creeks etc.

3. **Stenus (s. str.) janthinipennis** Lea, 1899

Stenus janthinipennis Lea 1899, *Proc. Linn. Soc. N.S.W.* 23: 544
Stenus janthinipennis, L Benick, 1916, *Ent. Mitt.* 5: 240 f

♂ Ventral characters of abdomen about as in *puncticollis*. Aedeagus (Fig. 3) with a distinctly narrower median lobe than in *cupreipennis*, also somewhat narrower than in *puncticollis*.

This species is remarkable by its aeneous shine and the reticulated abdomen having fine granules and no punctures on the anterior tergites.

Length of body: 4·0–4·5 mm.

Material examined: ♀ holtotype and 3 ♂♂, 5 ♀♀ paratypes Upper Ord R. (SAM); 2 ♂♂, 1 ♀ Kimberley District, Mjöberg (Naturhistorisk Riksmuseet Stockholm, coll.m.); 5 ♂♂, 7 ♀♀ W. Aust. (DASP, DEI, coll.m.); ♂♂ Adelaide R., N.T. (B.M.)

Distribution: N.T., W. Australia, ripicolous like the preceding species.

4. **Stenus (s. str.) olivaceus** Macleay, 1871

Stenus olivaceus Macleay 1871, *Trans. Ent. Soc. N.S.W.* 2(2): 148 f.
Stenus olivaceus, Fauvel, 1877, *Ann. Mus. Civ. Stor. Nat. Genova* 10: 209.
Stenus olivaceus, Fauvel, 1878, *l.c.* 13: 503 f.
Stenus olivaceus, Lea, 1899, *Proc. Linn. Soc. N.S.W.* 23: 545.

♂ ventral characters of abdomen about as in *cupreipennis* but emargination of sternite 8 broader and shallower (Fig. 25). Aedeagus (Fig. 4).

Length of body: 4·0–4·3 mm.

Material examined: 1 ♂, 3 ♀♀ syntypes from Gayndah on two cards (MLM) ♂ lectotype, 1 *Stenus olivaceus*, Macl. Gayndah; 2 ♂ lectotype right/Puthz 1969; 3 ♀ paralectotype left/Puthz 1969; 4 *Stenus olivaceus* Macleay vid. V. Puthz 1969. The lectotype has somewhat damaged antennae, the paralectotype mounted on its

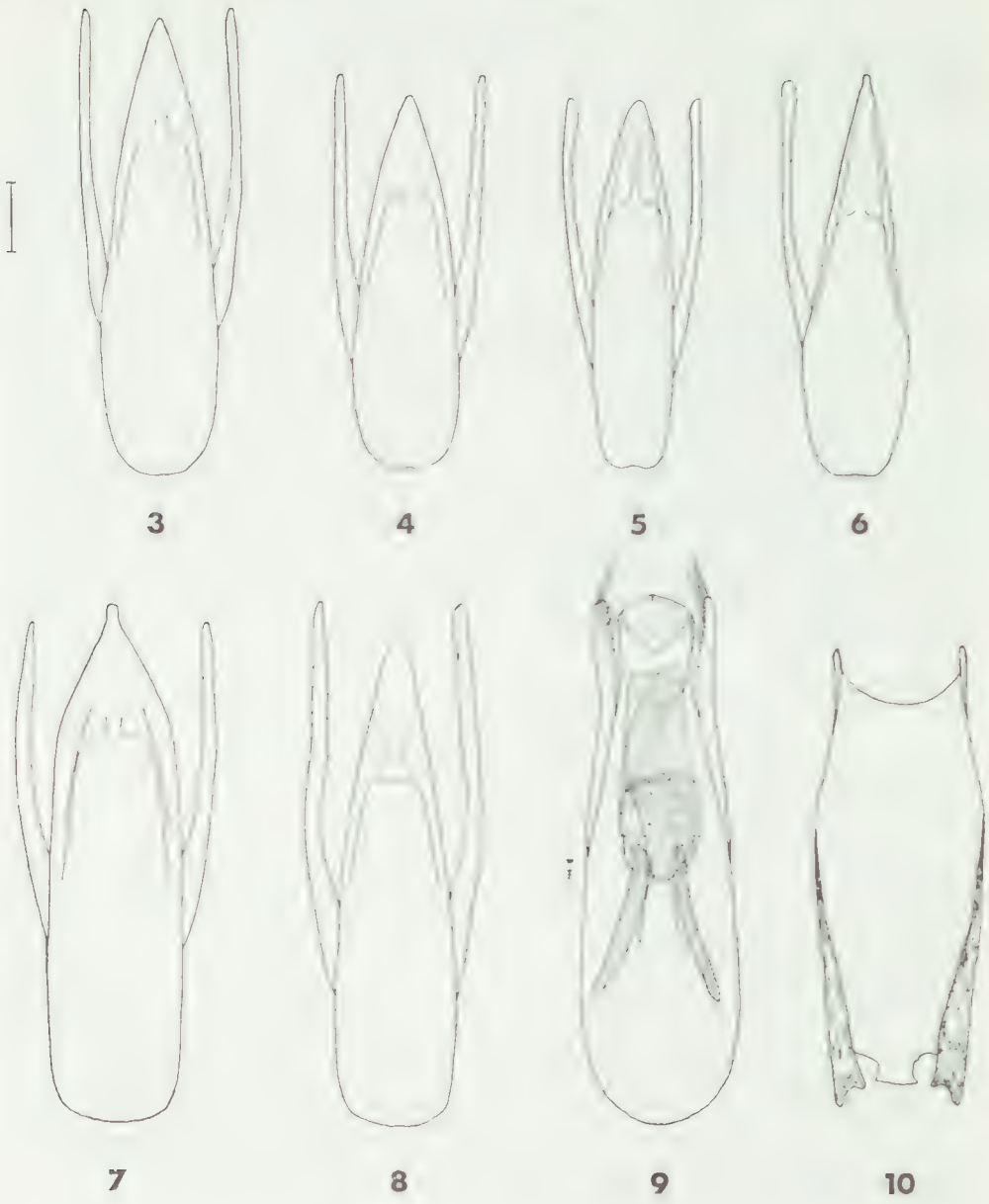

Fig. 3-8—Outline of ventral aspect of aedeagus. 3: *Stenus janthinipennis* Lea (Kimberley district). 4: *Stenus olivaceus* Macleay (Gayndah). 5: *Stenus retitogatus* n. sp. (holotype). 6: *Stenus atrovirens* Fauvel (*similis* Macleay lectotype). 7: *Stenus leai* (right paramere lacking) Bernhauer et Schubert (holotype). 8: *Stenus neboissi* n. sp. (holotype).

Fig. 9, 10—*Stenus gayndahensis* Macleay (lectotype). 9: Ventral aspect of aedeagus. 10: 9th sternite of ♂. Scale = 0·1 mm.

dorsal side. 2 ♀♀ paralectotypes ibidem. N.S.W.: 1 ♀ Windsor, Ferguson (CSIRO); 1 ♂ near Cooma, Pospisil (coll. Scheerpeltz); 5 ♂♂, 2 ♀♀ Clarence River (SAM); Qld: 1 ♂, 1 ♀ Gayndah (coll. Fauvel, coll. Benick); 3 ♂♂, 2 ♀♀ Cairns, Hacker ("*sjöstedti* Bernh. i.l.") (DEI, coll. Benick, coll.m.); 1 ♀ Brisbane, Coates (SAM); 1 ♂ Qld. (DEI); 1 ♂, 1 ♀ Maryborough, E. W. Fischer (coll. Scheerpeltz).

Distribution: N.S.W., Qld, ripicolous as the preceding species.

5. **Stenus (s. str.) retitogatus** sp. nov.

This new species resembles *S. olivaceus* in its general facies, *S. janthinipennis* in its microsculpture.

Black with an olive tint, moderately shining, coarsely and closely puncturated, not very distinctly pubescent. Antennae yellowish brown, the club infuscated. Palpi yellow. Legs with the basal portion of femora yellow, the apical portion dark brown, tibiae yellowish brown, tarsi yellowish brown with the apices of segments infuscated. Labrum dark brown.

Length: 3·6–3·9 mm.

♂ holotype, N.W. Qld. Charters Towers, W. of Hughenden, Hacker; 1 ♂ 1 ♀ paratypes, Adelaide R., N.T. (BM)

Measurements (in microns): Width of head 699; average distance of eyes 407; width of pronotum 547; length of pronotum 623; distance between shoulders about 636; width of elytra 776; length of elytra 857; length of suture 724; posterior tarsi 168–140–127–101–152.

♂ ventral surface of abdomen coriaceous. 7th sternite broadly emarginated at posterior border, with a distinct impression, the sides of which are carinated posteriorly, inside it very finely and densely granulated and pubescent. 8th sternite with a narrower but not deeper emargination than in *olivaceus*. The aedeagus (Fig. 5) is very similar to those of the related species, somewhat narrower than in *olivaceus* and *janthinipennis* with the median lobe longer in proportion to the parameres and apically somewhat broader.

From *olivaceus* the new species differs by its densely and closely reticulated abdomen, which is scarcely perceptibly puncturated, shallower puncturation of the whole surface, especially of the pronotum, and its remarkable reticulation also of the foreparts. From *janthinipennis* it is at once distinguished by longer and narrower elytra, the colouration and deeper excavated middle of front.

Distribution: Qld.

Holotype in the Deutsches Entomologisches Institut, Eberswalde, D.D.R.

6. **Stenus (s. str.) atrovirens** Fauvel, 1878

Stenus atrovirens, Fauvel 1878, *Ann. Mus. Civ. Stor. Nat. Genova* 13: 503
Stenus similis, Macleay 1871 (nec Herbst 1784), *Trans. Ent. Soc. N.S.W.* 2(2): 149.
Stenus macleayi, Scheerpeltz 1933, *Col. Cat.* 129: 1159 (n.n.) nov. syn.

From both species I examined the types; they are conspecific. ♂ 7th sternite with a broad and short impression posteriorly, finely and very densely punctated and pubescent, outside of the impression finely and very sparsely punctated, at posterior margin broadly and shallowly emarginated. 8th sternite with a somewhat narrower emargination than in *olivaceus* which is as shallow as in *olivaceus*. Aedeagus (Fig. 6).

Material examined: ♂ holotype and 1 ♂, 1 ♀ paratypes of *atrovirens* (BM, coll. Fauvel), 2 ♂♂ syntypes of (*similis* Macleay) (MLM); 1 ♂, 1 ♀ Rockhampton, Lea (SAM, coll.m.).

Distribution: Qld.

7. **Stenus (s. str.) macellus** Fauvel, 1878

Stenus macellus, Fauvel 1878, *Ann. Mus. Civ. Stor. Nat. Genova* 13: 504.
Stenus macellus, Puthz (in press), *Bull. Inst. r. Sci. nat. Belg.*

♂ 6th sternite with a triangular impression in posterior half, inside it nearly impunctate, sides with longer pubescence. 7th sternite deeper impressed than in *cupreipennis*, sides distinctly carinated, with longer pubescence, inside finely and moderately densely punctated. Emargination of 8th sternite slightly deeper than in *olivaceus*. The aedeagus has a relatively broad and short median lobe which is triangularly acuted to apex and curved dorsally having a ventro-median carina. Parameres about as long as median lobe.

Length of body: 3·4–3·7 mm.

Material examined: 1 ♂, 2 ♀♀ syntypes King George Sound, two on one card, ♂ lectotype, 1 ♂ lectotype right Puthz 1969; 2 K. George Sound (red label); 3 Sharp Coll. 1905-313.; 4 44 *Stenus macellus* Fauvel types K. Geo. Sound (Sharp's handwriting); 5 ♀ paralectotype left Puthz 1969; 6 *Stenus macellus* Fauvel vid. V. Puthz 1969 (BM). The aedeagus of the lectotype extracted. 1 ♀ paralectotype in coll. Fauvel.

Distribution: W. Australia.

8. **Stenus viridiaeneus** Macleay, 1871 (species incertae sedis)

Stenus viridiaeneus, Macleay 1871, *Trans. Ent. Soc. N.S.W.* 2(2): 149.
Stenus viridiaeneus, Fauvel 1877, *Ann. Mus. Civ. Stor. Nat. Genova* 10: 209.

Of this species the types could not be located in the author's or other collections. The description is completely insufficient, it is impossible to recognize the subgenus.

The diagnosis is as follows:

"Length 2 lines. Black, opaque. Head smooth between the eyes. Thorax without puncturation in the middle, but with transverse looking punctures towards the apex and base, which are both rather constricted. Elytra strongly punctured, and of a brassy green colour with a ruddy hue in the middle."

9. **Stenus (Tesnus) convexiusculus** L. Benick, 1921

Stenus convexiusculus, L. Benick 1921, *Ent. Mitt.* 10: 193 (n.n.).
Stenus indistinctus, Lea 1899 (nec Casey 1884), *Proc Linn. Soc. N.S.W.* 23: 543.
Stenus indistinctus, L. Benick 1961, *Ent. Mitt.* 5: 241.

♂ Metasternum along the middle smooth. 6th sternite near posterior margin somewhat shallowed, denser punctated and pubescent than on the sides, with a distinct but shallow and broad emargination posteriorly. Emargination of sternite 8 about as in *cupreipennis*. Aedeagus with a narrow median lobe having a narrowly rounded apex but not button shaped as in *caviceps*, parameres well extending beyond the median lobe. Variability: Middle of pronotum distinctly to indistinctly smooth.

Material examined: 2 ♂♂, 4 ♀♀ types (all on one large card). N.S.W.: Clarence River (SAM, coll.m.); 1 ♂ paratype Clarence R. (BM); 1 ♀ Qld: Tambourine Mt., 17.II.1960, E. M. Exley leg. (QM).

Distribution: N.S.W., Qld.

10. **Stenus (Tesnus) leai** Bernhauer et Schubert, 1911

Stenus leai, Bernhauer et Schubert 1911, *Cat. Col.* 29: 175 (n.n.).
Stenus leai, L. Benick 1916, *Ent. Mitt.* 5: 241.
Stenus longiventris, Lea 1899 (nec Sharp 1886), *Proc. Linn. Soc. N.S.W.* 23: 542 f.

♂ 3rd–5th sternite somewhat sparser punctated posteriorly than on sides, 6th sternite in posterior half with a broad but short impression, inside finer and sparser punctated than on sides, 7th sternite with a broad-triangular and deep impression in posterior two thirds, inside finely and not densely punctated and coriaceous, sides of

impression somewhat denser pubescent, posterior margin with a broad and shallow emargination. 8th sternite in posterior eleventh broadly triangularly emarginated, somewhat narrower than in *caviceps*. Aedeagus (Fig. 7).

Material examined: ♂♀ types (on one card) W. Australia: E. Kimberley, Behn River, R. Helms (SAM); Qld: 1 ♀ Claudie River, Kershaw (NMV); 1 ♀ Cairns dist., Dodd (SAM); 2 ♀♀ without locality (QM, coll.m.).

Distribution: Qld and E. Kimberley.

11. **Stenus (Tesnus) caviceps** Fauvel, 1877

Stenus caviceps, Fauvel 1877, *Ann. Mus. Civ. Stor. Nat. Genova* 10: 207 f.
Stenus caviceps, Fauvel 1878, *l.c.* 12: 223.
Stenus caviceps, L. Benick 1928, *Ent. Mitt.* 17: 177 f.
Stenus caviceps, Puthz (in press), *Bull. Inst. r. Sci. nat. Belg.*
Stenus caviceps, Puthz (in press), *Ann. Mus. Civ. Stor. Nat. Genova.*

The description of the ♂ sexual characters with figures was given by me in the first quoted publication, the lectotypology in the second.

Material examined: ♂ lectotype and ♀ paralectotype. Qld: Somerset, Cape York (Museo Civico di Storia Naturale di Genova, coll. Fauvel); 2 ♂♂, 4 ♀♀ Coen, Hacker, Oke (NMV, DEI, coll.m.); 5 ♂♂, 7 ♀♀ Cairns, Oke, Hacker (DEI, NMV, coll. Benick, coll.m.); 1 ♂ Mulgrave R., Hacker (SAM); 1 ♀ Qld Hacker (SAM); 1 ♀ New Guinea, Katau near Fly River (Museo Civico di Storia Naturale di Genova).

Distribution: N.E. Australia, S.E. New Guinea.

12. **Stenus (Tesnus) villosiventris** Lea, 1899

Stenus villosiventris, Lea 1899, *Proc. Linn. Soc. N.S.W.* 23: 543 f.
Stenus villosiventris, L. Benick 1916, *Ent. Mitt.* 5: 241.

♂ ventral characters of abdomen about as in *cupreipennis*, aedeagus with a very narrow and apically narrowly button-shape-rounded median lobe, parameres distinctly shorter than median lobe. Internal structures as in *cupreipennis*.

Length of body: 5·0–5·5 mm.

This species is easy to identify by its long erect pubescence of the abdomen.

Material examined: ♂ holotype and ♂♀ paratypes Windsor (SAM); V: 1 ♂ Clarkefield, Wilson (NMV); 1 ♂ Warburton, Oke (NMV); 2 ♀♀ Carrum, Oke (NMV, coll.m.); 1 ♀ Belgrave, Wilson (NMV); 1 ♀ Bendigo, Oke (NMV); 1 ♀ Beaconsfield, Oke (NMV); N.S.W.: 2 ♂♂, 2 ♀♀ Windsor (coll. Fauvel, coll.m.); 6 ♂♂, 1 ♀ N.S.W. (CSIRO, DEI, NMV, Tschechisches Nationalmuseum Prag); Qld: 1 ♂ Cairns, Oke (NMV); 1 ♂, 1 ♀ "W. Australia" (DASP) (false patria?).

Distribution: V, N.S.W., Qld, and W. Australia (?).

13. **Stenus (Tesnus) neboissi** sp. nov.

This new species resembles *S. australicus* and (much less) *S. caviceps*.

Brilliant black, slightly aeneous, head and pronotum finely, elytra very coarsely, abdomen extremely finely punctured, shortly pubescent. Antennae reddish-brown. Palpi pale. Legs reddish yellow, apical portion of femora and apices of tarsal segments infuscated. Labrum dark brown.

Length: 4·0–4·7 mm.

♂ holotype and ♀ paratype Qld: Cairns, Jan. 1950, C. Oke leg.; 2 ♀♀ paratypes Halifax, 9.6.1919, F. X. Williams leg.

Head about as broad as elytra (♂) (measurements in microns) (839: 832), in the ♀ slightly narrower, with a narrow front (average distance of eyes 467) separated into 3 portions nearly equal in width; two side portions distinctly but not very much declining from inner eye margins towards middle, and middle of front, which is deeply excavated from the side portions and even. Punctation moderately fine and sparse,

Antennae reddish brown, club infuscated. Palpi yellowish brown, apex of 3rd segment and 4th segment brown. Base of femora (about two thirds) bright-red, rest of legs dark brown. Labrum blackish brown.

Length: 4·1 mm.

♀ holotype "Mountains of Victoria," near Wandiligong (BM).

Narrow head slightly broader than elytra between humeri (794: 768), front moderately broad (average distance of eyes 448), its middle portion fully even, deeply excavated, about as broad as each of the side portions. Puncturation fine and sparse, diameter of a puncture smaller than basal section of 3rd antennal segment, interspaces larger than punctures. The smooth antennal tubercles represent the only elevated portions of the front.

Antennae when reflexed extending about to the posterior margin of pronotum, penultimate segments distinctly longer than broad.

Prothorax distinctly somewhat longer than broad (678: 614), widest distinctly behind the middle, to anterior margin firstly straight then shallowly concave, to posterior margin distinctly concavely narrowed, with a shallow anterior and a shallow posterior restriction on surface. Punctation differently coarse and close, in middle the punctures are about as fine as on head, very sparse, near anterior, posterior margin and the sides its diameter often exceeds the section of 3rd antennal segment, interspaces sometimes smaller than half of a puncture.

Elytra large, between humeri somewhat narrower than head, much broader than head in its broadest point (935: 794), somewhat longer than broad (973: 935), sides behind prominent shoulders scarcely straightly enlarged posteriorly, distinctly restricted in posterior quarter, posterior margin very deeply emarginated (length of suture 819). Surface very uneven (resembling *S. kitondoensis* Cameron from Africa), impression of suture not very distinct, humeral impression somewhat before middle of elytra enlarged and deepened, in posterior half a distinct external impression. Punctation very coarse and differently close, average diameter of a puncture larger than section of 2nd antennal segment. In posterior two third the elytra are smooth near suture on the rest the interspaces of punctures are as large as or smaller than the punctures.

Abdomen cylindrical, scarcely narrowed posteriorly, basal furrows of first segments very deep, 7th tergite with a distinct membranous fringe at posterior margin. Punctation very fine and very sparse.

Legs slender, posterior tarsi at least as long as two thirds of the femora, 1st segment about as long as 2 and 3 together, much longer than the last.

Whole surface lacks microsculpture.

♀ 8th sternite broadly rounded.

To differ *S. australicus* from the related species see key below.

15. **Stenus (Hypostenus) cursorius** L. Benick, 1921

Stenus cursorius, L, Benick 1921, *Ent. Mitt.* 10: 193 (n.n.).
Stenus cursorius, L. Benick 1938, *Stett. Ent. Ztg.* 99: 5, 26.
Stenus cursorius, Puthz (in press). *Bull. Inst. r. Sci. nat. Belg.* (figs).
Stenus planifrons, Fauvel 1889, *Rev. Ent.* 8: 253.
Stenus planifrons, Fauvel 1903, *l.c.* 22: 262.

This species is widely distributed in the whole Oriental, Australian and Melanesian Regions, subspecies also in the Ethiopian Region. From Australia it was firstly announced by Fauvel 1903.

Material from Australia examined: N. Australia: 2 ♀♀ Adelaide River (coll. Fauvel); Qld: 1 ♂ Paluma Dam, Monteith (UMQ); 2 ♂♂, 2 ♀♀ Townsville (BM, SAM, coll.m.); 1 ♂, 2 ♀♀ Mulgrave River, Hacker (BM, DEI); 3 ♂♂, 5 ♀♀ Cairns, Hacker (DEI, SAM); 1 ♀ Coen, Cape York, Hacker (DEI); 1 ♀ Redlynch, R. G. Wind (CAS); 1 ♂ Mont Molloy, Darlington (MCZH); 1 ♀ Gayndah, Macleay (MLM);

diameter of a puncture nearly as large as basal section of 3rd antennal joint, interspaces larger than punctures, middle of front almost impunctate.

Antennae when reflexed extending about to the posterior margin of pronotum, joints of club distinctly longer than broad.

Prothorax bulging, distinctly longer than broad (696: 594), widest behind the middle, to anterior margin slightly convexly (before anterior margin somewhat concavely), to posterior margin very distinctly concavely narrowed (cordiforme), with a shallow anterior and distinct posterior restriction on surface. Punctation moderately fine and sparse, punctures near anterior and posterior margins somewhat larger than section of 3rd antennal segment, interspaces here not at all as large as punctures, finer in the middle, about as fine as on front, interspaces larger than punctures, middle sometimes nearly impunctate.

Elytra in the ♂ nearly as broad as head (832: 839), in the ♀ somewhat broader, slightly longer than broad (882: 832), humeri angulate, sides nearly straight, distinctly restricted in posterior quarter, posterior margin deeply emarginated (length of suture 772). Sutural depression not very distinct, humeral depression distinct but shallow. Punctation very coarse and moderately dense, diameter of a puncture larger than section of 2nd antennal segment, interspaces about half as large as a puncture, sometimes about as large as near suture, on posterior declination of elytra the punctation is much finer and sparser.

Abdomen cylindrical, immarginated, slightly narrowed posteriorly, basal furrows of first segments very deep. 7th tergite with a distinct membranous fringe at posterior margin. Except for the bases of tergites 3 and 4 the puncturation throughout is extremely fine and sparse, diameter of a puncture about as large as one eyefacet,- interspaces three times or more as wide as punctures.

Legs slender, hind tarsi at least as long as two thirds of femora, 1st segment somewhat shorter than the three following together, nearly twice as long as the last 323–136–110–85–78. 4th segment simple.

The whole insect lacks microsculpture, except for hind portion of sternite 7.

♂ femora in middle somewhat enlarged. 6th sternite at posterior margin nearly imperceptibly emarginated. 7th sternite broadly shallowed and there distinctly denser puncturated and pubescent like the preceeding ones, with a shallow and broad emargination at posterior margin. 8th sternite with a triangular excavation in posterior sixth (much deeper than in *caviceps*). 9th sternite about as in the related species. 10th tergite broadly rounded. Aedeagus (Fig. 8) about as in *atrovirens* but the parameres longer.

♀ 7th sternite with a very shallow emargination at posterior margin, before it denser punctated, pubescent, and somewhat microsculptured. 8th sternite rounded.

Stenus neboissi can be distinguished from the Australian *Steni* having their abdomen immarginated and the tarsi simple as follows: from *australicus* Blackburn by its larger head and the nearly even elytra, from *caviceps* Fauvel, *leai* Bernhauer et Schubert, and *convexifusculus* L. Benick by its extremely fine abdominal puncturation, from *villosiventris* Lea by lacking long erect abdominal pubescence and broader head. It resembles mostly *S. australicus* which should be regarded as its sister-species.

I am pleased to name this remarkable new species after Mr. A. Neboiss, Curator of Insects in the National Museum of Victoria, to express my thanks for cooperation.

Holotype in the National Museum of Victoria, Melbourne, paratypes in The Bishop Museum, Honolulu, and in my collection.

14. **Stenus (Tesnus) australicus** Blackburn, 1891

Stenus australicus, Blackburn 1891, *Proc. Linn. Soc. N.S.W.* (2) 5: 788.

From the British Museum Natural History I got the ♂ holotype for revision and give a redescription of it because of the insufficient diagnosis given by the author:

Brilliant black, differently coarsely and sparsely punctated, scarcely pubescent.

margin moderately emarginated (length of suture 678). Sutural and humeral impression distinct but not deep. Puncturation about as coarse and close as on pronotum, the inner third scarcely sparser punctated than the outer two thirds.

Abdomen cylindrical, moderately narrowed posteriorly, basal restrictions of first segments moderately deep, 7th tergite with a distinct membranous fringe posteriorly. Punctation coarse and close, on first segments as coarse as on elytra, posteriorly finer, on tergite 7 about as large as basal section of 3rd antennal segment, distances about as large or somewhat larger than punctures themselves.

Legs moderately slender, posterior tarsi about two thirds as long as tibiae 115–90–90–102–147.

The whole surface lacks microsculpture.

♂ femora thicker than in ♀. 3rd–5th sternite coarsely and closely punctated, 6th sternite with a very fine and little dense punctation, 7th sternite with a very shallow emargination at posterior border, not shallowed along the middle, very finely and densely puncturated and pubescent. 8th sternite (Fig. 26). 9th sternite (Fig. 10). 10th tergite rounded. The aedeagus (Fig. 9) has a large opening of the median lobe anteriorly which shows apical portions of membranes set with small spines. Inside there are a strong sclerotized broadly tubous internal sac and basally two longitudinal clasps. Parameres about as long as median lobe, closely set with fine setae at their ends.

♀ 8th sternite broadly rounded. Valvifera with a long tooth apicolaterally. 10th tergite broadly rounded. Distinctly sclerotized spermatheca lacking.

For determination see key below.

Distribution: N.S.W., Qld.

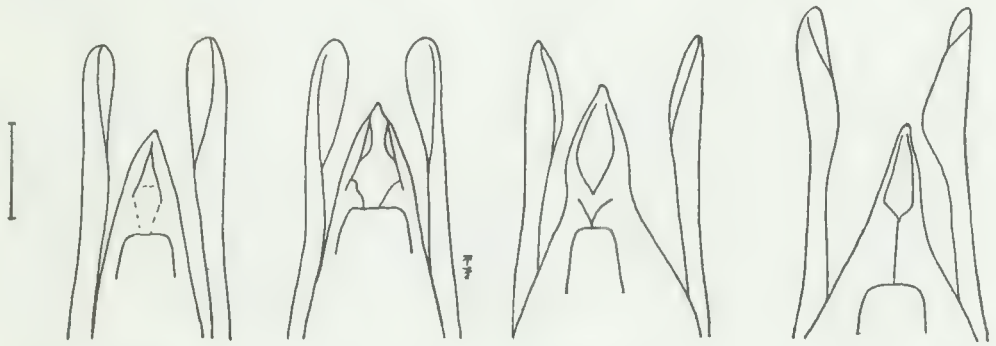

Fig. 11-14—Apical portion of aedeagus ventral facies, for demonstrating the variability of *Stenus piliferus obesulus* Fauvel: 11 (Brisbane), 12 (Blackall), 13 (Molloy, N. Qld), 14 (Wide Bay). Scale = 0·1 mm.

17. **Stenus (Hypostenus) piliferus obesulus** Fauvel, 1878 ssp. propr.

Stenus obseulus, Fauvel 1878, *Ann. Mus. Civ. Stor. Nat. Genova* 13: 506.
Stenus hackeri, L. Benick 1928, *Ent. Mitt.* 17: 180 ff.
Stenus piliferus gayndahensis, Puthz 1966, *Mem. Est. Mus. Zool. Univ Coimbra.* 297: 11 f., figs.

Because of not knowing the types of *gayndahensis* and of remarks of Lea 1899 (see above) in 1966 I confused *piliferus obesulus* with *gayndahensis*. Both are quite distinct, although very similar in general appearance. The striking differences are to be found in the ♂ sexual characters, in the aedeagus and in the 9th sternite. Both forms belong to the same monophyletic group, *gayndahensis* is the apomorphic species (after Hennig).

1 ♀ Bellenden Ker, Mjöberg (SAM); 2 ♂♂ Laura, Mjöberg (SAM); 1 ♂, 1 ♀ N. Qld, Hacker (SAM); 2 ♂♂, 2 ♀♀ Rockhampton, Lea (SAM).

Distribution: N. and N.E. Australia, New Guinea, New Caledonia, Oriental Region.

16. **Stenus (Hypostenus) gayndahensis** Macleay, 1871

Stenus gayndahensis, Macleay 1871, *Trans. Ent. Soc. N.S.W.* 2(2): 149.
Stenus gayndahensis, Fauvel 1877, *Ann. Mus. Civ. Stor. Nat. Genova* 10: 209.
Stenus gayndahensis, Lea 1899, *Proc. Linn. Soc. N.S.W.* 23: 545.
Stenus piliferus gayndahensis, Puthz 1966, *Mem. Est. Mus. Zool. Univ. Coimbra*, 297: 11 f. (falsus).

Because of a note of Lea 1899 I confounded this species with *piliferus obesulus* Fauvel. The original description is insufficient, Macleay also confounded his species with two others, therefore it was necessary to choose a lectotype (see below).

Redescription: Black, shining, coarsely and closely punctated, with a short but distinct argenteous pubescence. Antennae yellowish red, the club infuscated. Palpi yellow, 3rd joint infuscated. Legs reddish yellow, femora at apex narrowly dark brown, bases of tibiae lighter than apical two thirds, which are sometimes brownish, apices of tarsal joints infuscated. Labrum brown.

Length: 3·5–4·1 mm.

Material examined: 1 ♂, 1 ♂ syntypes (on one card); the ♂ left has "a short raised smooth line on the middle" = *gayndahensis* lectotype, the ♂ right has the front uniformly punctated = *cursorius* L. Benick. Because of the smooth head portions the left ♂ is without any doubt the true *gaynhahensis* Macleay. In his collection there were to be found 4 specimens from Wide Bay (by Macleay determinated as "*gaynda-hensis*" but all belonging to *piliferus obesulus*, which is from its general facies very similar to *gayndahensis*). ♂ lectotype: 1 *Stenus gayndahensis*, Macl. Gayndah; 2 ♂ lectotype left/Puthz 1969; 3 *Stenus gayndahensis* Macleay left vid. V. Puthz 1969; 4 *Stenus cursorius* Bek. ♂ right det. V. Puthz 1969.

N.S.W.: 1 ♂, 1 ♀ Bogan River, Armstrong (coll. Steel); Qld: 2 ♀♀ "Coomoo 1, Dawson distr. Austr. mér." (coll. Fauvel; is it near Dawson River or Cooma in Victoria?); 1 ♂ Mt. Glorious, Savage (QM); 1 ♂, 1 ♀ Brisbane, Haseler (UMQ, coll.m.); 1 ♂, 1 ♀ Archer Creek, Mt. Garnet, Brooks (NMV); 1 ♂ Cairns, Oke (NMV); 1 ♀ Mogill near Brisbane, Gressitt (BMH). Specimens quoted by Lea 1899 should be found in the SAM (not seen and because of many wrong determinations of Lea doubtful), 1♂1♀ Townsville (BM); 1♂ Eungella Nat. Park 4 Aug. 1968 T. Weir (UMQ).

Head about as broad as elytra between shoulders (692 : 678), front narrow (average distance of eyes 333) with five distinct shining plaques: one in the middle, two antennal tubercles, and one near each inner eye margin. The front has two distinct and narrow longitudinal furrows, its smooth median portion is about as broad as each of the side portions, distinctly elevated, extending beyond the inner margins of eyes. Punctation moderately coarse and very dense, diameter of puncture about as large as section of 6th antennal segment, distances smaller than half a puncture.

When reflexed the short antennae do not extend to the posterior margin of pronotum, penultimate joints distinctly longer than broad.

Prothorax scarcely longer than broad (589: 577), broadest in the middle, to anterior margin convexely rounded, to posterior margin shallowly concavely restricted. Punctation coarse and close, diameter of a puncture nearly as large as section of second antennal joint, distances smaller than half a puncture. The interspaces between the punctures are larger along the middle, nearly as large as one puncture, giving a facies of a smooth central line which is not raised.

Elytra somewhat broader than long (872: 832) with the shoulders prominent, sides posteriorly scarcely enlarged, distinctly restricted in posterior quarter, hind

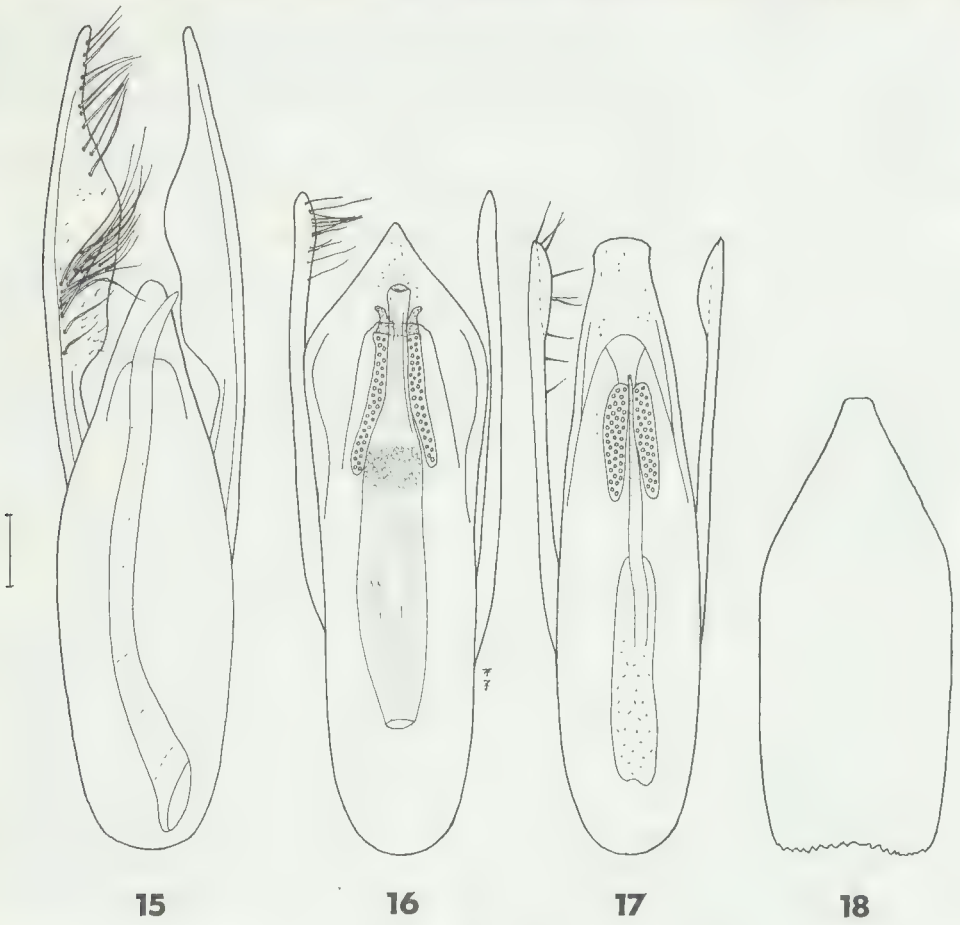

Fig. 15-18—Ventral aspect of aedeagus, setae of right paramere not figured. 15: *Stenus coeruleus* Waterhouse (paratype), expulsation mechanism not figured. 16: *Stenus platythrix* n. sp. (paratype). 17: *Stenus pseudocoeruleus* n. sp. (Cairns). 18: 9th sternite of ♂ of 17. Scale = 0·1 mm.

by which it is at once distinguished from all other Australian species. The sister-species is *hestiocorus* Puthz of New Britain (cf. Puthz 1968d).

Material examined: ♂ holotype and ♀ paratype Port Bowen, N.S.W. (BM); ♂ holotype of *semicoeruleus* L. Benick env. Sydney (ZMB). N.S.W.: 1 ♂ Barrington House via Salisbury, Monteith (UMQ); 1 ♂ Atherton, ex citrus, Ettershank (UMQ); 2 ♀♀ Atherton, ex *Passiflora edulis*, Ettershank (coll.m.); 1 ♂ Eungai, Carter et Deane (UMQ); 7 ♂♂, 15 ♀♀ N.S.W. (DASP, CAS, NMV, American Museum of Natural History, coll.m.); 1 ♂, 4 ♀♀ Sydney (coll. Fauvel, coll.m., CSIRO); 1 ♀ Kurrajong, H.S.C. (UMQ); 3 ♂♂, 1 ♀ Clyde River (CSIRO); 2 ♂♂, 1 ♀ Illawarra, Carter (NMV); 1 ♂, 2 ♀♀ Comboyne, Armstrong (coll. Steel); 1 ♂, 1 ♀ Narara, Oke (NMV); 1 ♀ Clarence R., Lea (SAM); 2 ♀♀ Gosford (SAM); 1 ♂, 1 ♀ Upper Williams River, Lea et Wilson (NMV); Qld: 1 ♀ Deception Bay, Belton (UMQ); 2 ♂♂ Nambour, Yeo (UMQ); 1 ♀ Tibrogargan Creek, Cantrell (UMQ); 1 ♀ Eungella, Woodward (UMQ); 1 ♂ Cedar Creek, Shepherd (UMQ); 2 ♀♀ Lamington National Park, Monteith (UMQ); 1 ♂ Maleay, Deane (UMQ); 2 ♀♀ Brisbane, Martin, Webb (UMQ); 2 ♂♂, 1 ♀ Millaa Millaa, Monteith (UMQ); 2 ♂♂, 1 ♀ Blackall Rgs., Wilson (UMQ, NMV);

Material examined: ♂ type 3 ♂♂ paratypes Qld. (BM); V: 1 ♂, 1 ♀ Warburton, Oke (NMV); Qld: 1 ♂ Maryborough, F. W. Fischer (coll. Scheerpeltz); 1 ♂, 2 ♀♀ Molloy, Darlington (MCZH, coll.m.); 1 ♂, 3 ♀♀ Wide Bay (amongst them 1 ♀ syntype of *obesulus* (of which the type, not seen, is in BM), coll. Fauvel, MLM); 2 ♂♂, 2 ♀♀ Brisbane, Hacker, Monteith (types of *hackeri* Bck. amongst them, DEI, UMQ); 3 ♂♂, 5 ♀♀ Blackall, Hacker (types of *hackeri* Bck. amongst them, DEI, coll.m.); 1 ♂ Bulburin, State Forest, Webb (UMQ); S.A.: 1 ♂ Lucindale, Lea (SAM); N.S.W. :2♂♂1♀ Clarence R., Lea (SAM); 1♂4♀♀ Tweed R., Lea (SAM); 1 ♂ Richmond R., (SAM).

This subspecies of the polytypic *piliferus* Motschulsky (which is distributed over the whole Oriental, Australian and Melanesian Region) shows a remarkable variability in Australia which is figured in Figs. 11–14. At the present state the few material does not allow any considerations on different subspecies in Australia.

Distribution: V, S.A., N.S.W., Qld.

18. **Stenus (Hypostenus) hornensis** sp. nov.

This new species resembles *S. gayndahensis* Macleay and perhaps represents a subspecies of it. Decision is possible only after knowing the male. A detailed diagnosis is not necessary; a comparison with *gayndahensis* is sufficient.

Black, slightly shining, coarsely and very densely punctated, distinctly but shortly argenteous pubescent. 1st antennal segment blackish brown, 2nd–6th segment reddish yellow, the club blackish brown. Palpi reddish yellow, apex of 2nd joint (narrowly) and apical two thirds of 3rd joint dark brown. Legs blackish brown, base of tibiae and bases of tarsal segments reddish yellow. Labrum blackish brown, moderately densely pubescent.

Length: 4·5 mm (abdomen somewhat extended).

♀ holotype Horn Island, Pellew Group, N.T., 22–28.II.1968, B. Cantrell leg.

This new species is distinguished from *gayndahensis* by its colouration, its more robust facies and above all its punctation of head and pronotum which is much denser than in *gayndahensis*. *S. gayndahensis* has the front distinctly furrowed longitudinally and five well separated shining plaques, the longitudinal furrows of *hornensis* are less distinct, the smooth plaques distinctly (although not at all) reduced, facies of front therefore more even and more uniformely punctated. Pronotum in opposition to *gayndahensis* without a smooth median line.

Stenus hornensis can be distinguished from *piliferus obesulus* by its different colouration and denser punctation, especially that of head.

Holotype in the Department of Entomology of the University of Queensland Museum of Entomology, Brisbane (T. 6700).

19. **Stenus (Hypostenus) coeruleus** Waterhouse, 1877

Stenus coeruleus, Waterhouse 1877. *Ent. mon. Mag.* 14: 24.
Stenus coeruleus, Fauvel 1877, *Ann. Mus. Civ. Stor. Nat. Genova* 10: 209 f
Stenus coeruleus, Fauvel 1878, *l.c.* 13: 506.
Stenus coeruleus, Lea 1899, *Proc. Linn. Soc. N.S.W.* 23(1898): 545.
Stenus coeruleus, L. Benick 1928, *Ent. Mitt.* 17: 178 (falsus).
Stenus coeruleus, Puthz (in press). *Mitt. Zool. Mus. Berlin* 46.
Stenus semicoeruleus, L. Benick 1928, (nec Cameron 1928) *l.c.* 179 ff.

This bright blue species belongs to a group which is very uniform in its general facies and of which the species are often confounded. Benick confounded *coeruleus* with his *semicoeruleus* which has been synonymized by me. The species regarded as *coeruleus* by Benick is a new one described below.

To differ *coeruleus* from the resembling species see key below. ♂ 8th sternite (Fig. 27). Aedeagus (Fig. 15) has a broad tubous internal sac and very large parameres

1 ♂, 2 ♀♀ Cairns, Britton (BM, CSIRO); 3 ♂♂, 4 ♀♀ Nerang (CAS); 1 ♀ Mt. Tambourine, Lea (DEI); 1 ♀ Townsville, Balogh (Hungarian National Museum, Budapest); 1 ♀ Mt. Glorious, Gressitt (BMH); 1 ♀ Childers, Pemberton (BMH); 1 ♂ Coolangata, Muir (BMH); 1 ♂, 1 ♀ Mogill near Brisbane, Gressitt (BMH); 1 ♂ Australia (CAS).

Distribution: N.S.W., Qld.

Remarks: Before knowing the types of *coeruleus* I determined this species as "*semicoeruleus* Bck." which should be corrected in the various collections.

20. **Stenus (Hypostenus) pseudocoeruleus** sp. nov.

This new species resembles very closely *S. coeruleus* and the other blue or blue-green coloured *Hyposteni* from Australia. Determination only by the general facies is difficult.

♂ holotype and 5 ♂♂, 8 ♀♀ paratypes Cairns, Hacker, Balogh, Williams and Chiu Chong; 2 ♂♂, 2 ♀♀ paratypes Hambledon, XI.1921, Pemberton; 2 ♂♂ paratypes Babinda, 18.IV.1919, F. X. Williams; 1 ♂ paratypes Eungai, N.S.W., XI.1928, Carter and Deane; 3 ♂♂, 1 ♀ paratypes New Guinea: N.E. Papua, Mt. Lamington, 1300–1500 ft, C. T. McNamara. 1♀ paratype Cairns district Lea (SAM).

Length: 5·5–6·3 mm.

Measurements (in microns): Width of head 940; average distance of eyes 508; width of pronotum 699; length of pronotum 889; distance between humeral angles about 826; width of elytra 1029; length of elytra 1270; length of suture 1003.

♂ sternite 5 in its apical half finely and very sparsely punctured, the punctures smaller than one eye facet, interspaces more than twice as large as punctures (in *coeruleus* the punctation is distinctly coarser and denser, the punctures are somewhat larger than one eye facet, the interspaces somewhat larger than the punctures, distinctly smaller than two punctures). 6th sternite shallowed in its apical middle, somewhat finer but twice as dense punctated than sternite 5. 7th sternite with a very fine and dense punctation in the middle, especially in basal half, where it is also somewhat shallowed (in *coeruleus* there is no ventral impression nor a shallowed portion). 8th sternite (Fig. 28). 9th sternite (Fig. 18). 10th tergite as in *coeruleus*. Aedeagus (Fig. 17) has a median lobe which is very broadly rounded apically. Inside there are longitudinal expulsation bands, a broad internal sac, and a strongly sclerotized tube. Parameres about as long as median lobe with some scattered long setae.

This new species can be distinguished from *platythrix* m. (s.b.) by the not reticulated anterior abdomen, from *improbus* m. (s.b.) by its proportions, finer elytral punctation and different ventral characters of abdomen, from *coeruleus* as mentioned above, and from *coelestis* Fauvel by different ventral characters of abdomen, from all by the aedeagus.

This species belongs to a phylogenetic group which has most of the species in New Guinea.

Holotype in the Deutsches Entomologisches Institut, Eberswalde, D.D.R., paratypes in Queensland Museum, Brisbane (T 6693-6695), the University Museum of Queensland, Brisbane, the British Museum Natural History, London, the Hungarian National Museum, Budapest, the DEI, the Bishop Museum, Honolulu, coll. Benick (Lübeck) and my collection.

21. **Stenus (Hypostenus) improbus** sp. nov.

This new species resembles very closely the two preceding ones and *coelestis* Fauvel. From all it is very difficult to separate it by knowing only the general facies.

Length: 6·0–6·5 mm.

Measurements (in microns): Width of head 1014; average distance of eyes 522; width of pronotum 724; length of pronotum 928; distance between humeral angles about 864; width of elytra 1092; length of elytra 1348; length of suture 1053.

♂ holotype Cairns, Hacker.

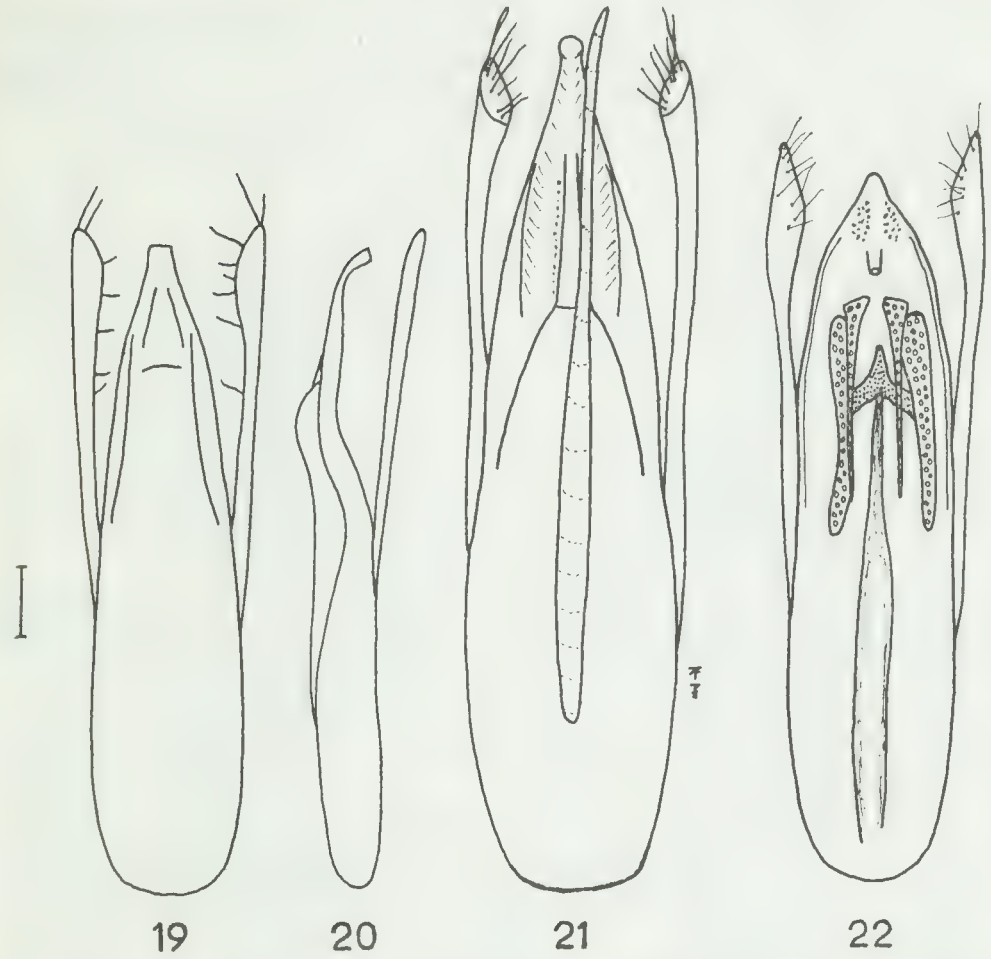

Fig. 19-22—Aedeagus, ventral and (20) lateral aspects. 19, 20: *Stenus improbus* n. sp. (holotype), without internal structures. 21: *Stenus bifenestratus* L. Benick (W. Aust.), without internal sac and expulsation mechanisms. 22: *Stenus guttulifer* Waterhouse (paratype). Scale = 0·1 mm.

It differs from *coeruleus* by its greenish shine, the elytra, which in proportion to the head are narrower and longer, the head, which is finer and sparser punctated and coarser punctation of elytra. The punctures of elytra are at least as large as the section of the 2nd antennal segment, their interspaces somewhat smaller than in *coeruleus*, the abdominal pubescence sparser and less erect.

♂ Punctation of sternite 3–5 coarse and sparse, twice as coarse at base, in the middle of sternite 5 punctures are nearly as large as basal section of 5th antennal segment, interspaces smaller than punctures. 6th sternite with a distinct impression in posterior fourth, sides carinated, posteriorly prominent like a small tooth, puncturation in impression fine and close, pubescence short, posterior margin between carinae very shallowly and nearly straightly emarginated. 7th sternite with a basal impression, finely punctated, pubescent, and coriaceous. 8th sternite deeply and narrowly emarginated (length of sternite: length of emargination = 63: 22). 9th sternite and 10th tergite like in *coeruleus*. The aedeagus (Figs. 19, 20) resembles that

of *pseudocoeruleus*, but the median lobe is narrower, its apex remarkably curved dorsally. Internal sac with a long tube which is somewhat expulsated in the type.

Stenus improbus can be distinguished from *pesudocoeruleus* by its proportions, coarser and closer puncturation of the elytra, and the ventral male characters, from *coelestis* Fauvel by its colour and the proportions, from both by the aedeagus.

Holotype in the Deutsches Entomologisches Institut, Eberswalde, D.D.R.

22. **Stenus (Hypostenus) platythrix** sp. nov.

In its general facies this new species resembles *S. coeruleus* and its allies, with which it was confounded by Lea although it is easy to differ. For description a comparison is sufficient. Dark blue, shining, coarsely and not densely punctated, procumbently pubescent. Antennae, palpi, and legs yellow, apices of tarsal joints infuscated. Clypeus densely pubescent. Labrum dark brown, sparsely pubescent.

Length: 5·5–6·0 mm.

♂ holotype and 1 ♂, 1 ♀ paratypes Cairns dist., A. M. Lea; 1 ♀ paratype env. Ingham, Qld, 22–28.III.1965, Expedition Dr. J. Balogh; 1 ♂, 2 ♀♀ paratypes Longland's Gap Evelyn Tableland, N. Qld, 350 m, 10.III.1956, J. L. Gressitt; 1 ♀ paratype E. Evelyn, N. Qld, in jungle, 11.III.1956, J. L. Gressitt. 1♀ paratype Kuranda 28 Nov. 1909 Bryant (BM); 7♂♂ 10♀♀ paratypes N. Qld. Blackburn (SAM, coll.m.); 17♂♂ 16♀♀ paratypes Cairns district, Lea (SAM, coll.m.).

Measurements (in microns) : Width of head 864; average distance of eyes 445; width of pronotum 648; length of pronotum 813; distance between humeral angles about 826; width of elytra 991; length of elytra 1180; length of suture 953. Posterior tarsi 203–83, 89–89–152.

One contradiction to *coeruleus* and the other resembling species the pubescence in the new species is sparsely and procumbent, especially on the abdomen ("*platythrix*"). Also the whole abdomen is microsculptured while in the other species only the last tergites have microsculpture.

♂ 3rd–5th sternite with denser punctation along the middle than on sides. 6th sternite shallowed along the middle, finely and densely punctated, chagreened, and pubescent, at posterior margin nearly imperceptibly emarginated. 7th sternite in the middle somewhat coarser punctated than sternite 6, but although finely and densely, chagreened, and pubescent, at posterior margin with a narrow, very shallow emargination. 8th sternite with atriangular notch in posterior sixth (length of sternite: length of emargination = 81: 14). 9th sternite with the sides apicolaterally somewhat produced and distinctly sawed, middle concave. 10th tergite broadly rounded. Aedeagus (Fig. 16) with a triangularly narrowed median lobe and a broad and tubous internal sac. Parameres slender, extending distinctly but not far beyond the median lobe.

♀ 8th sternite rounded, in middle somewhat produced.

Holotype in coll. Scheerpeltz (Wien), paratypes ibidem, in the Hungarian National Museum, Budapest, the Bishop Museum Honolulu, and in my collection.

23. **Stenus (Parastenus) bifenestratus** L. Benick, 1926

Stenus bifenestratus, L. Benick 1926, *Ent. Mitt.* 15: 278 f.

The types of this species have been destroyed in the last war with the Hamburg Museum. Specimens of the same series (topotypes) were found in Fauvel's collection.

This species is easy to identify by its very dense but not confluent elytral punctation and the spot (Fig. 29).

♂ ventral abdomen coarsely and densely punctated, interspaces shining, punctation of the middle of sternite 7 somewhat finer and closer. 8th sternite with a moderately narrow triangular notch in posterior eleventh. 9th sternite with a short rounded tooth on each side apicolaterally, concave in middle. 10th tergite rounded. Aedeagus (Fig. 21) with a long tube of internal sac.

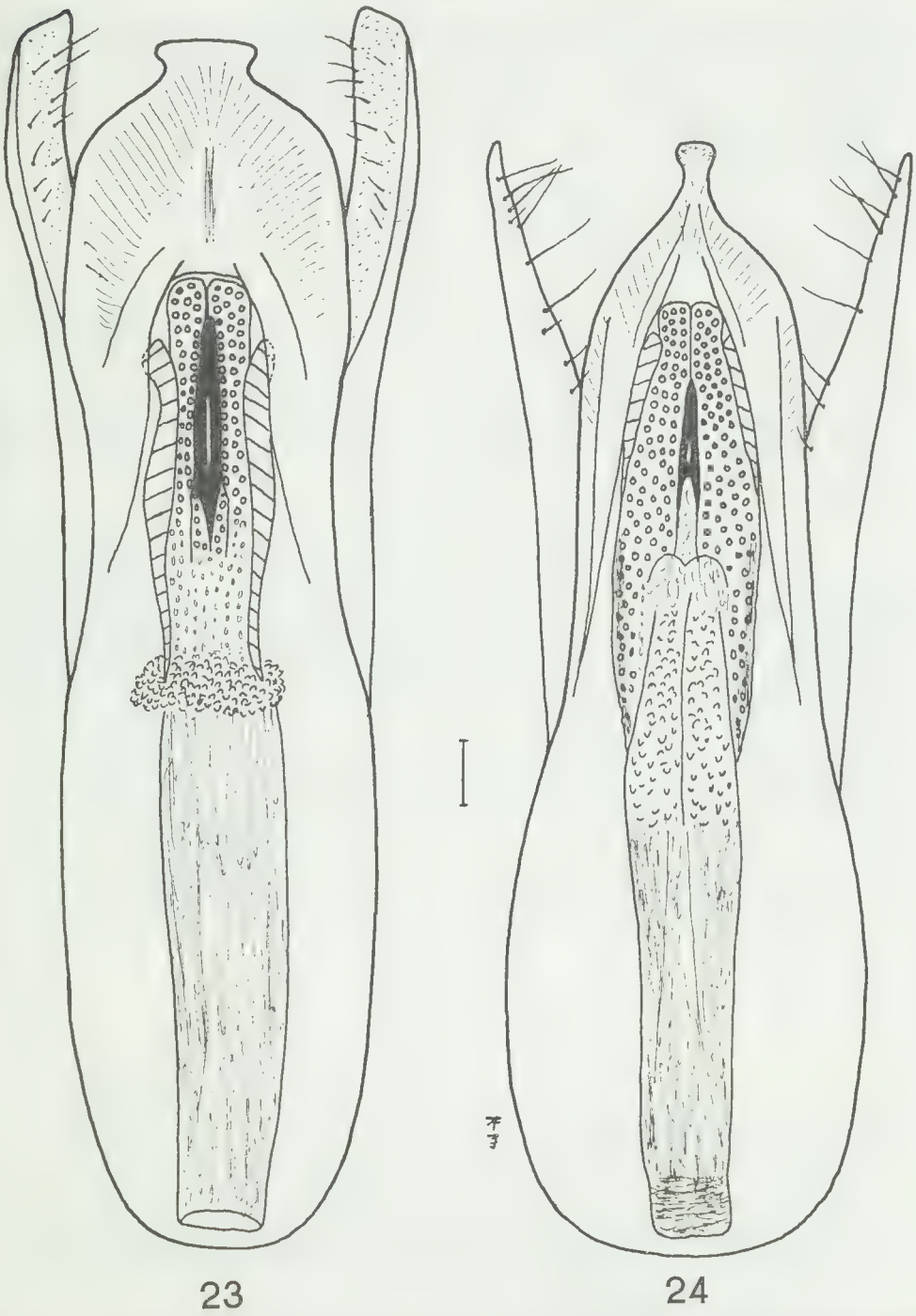

Fig. 23, 24—Ventral aspect of aedeagus. 23: *Stenus maculatus* Macleay (lectotype). 24: *Stenus pustulifer* Fauvel (Club Terrace, E. V). Scale = 0·1 mm.

Material examined: 2 ♂♂, 2 ♀♀ "Austr. occ." (coll. Fauvel, coll.m.); 1 ♀ W. Aust. Darlington 450 ft, 5.IV.62, E. S. Ross and D. Q. Cavagnaro leg. (CAS); 2 ♂♂, 5 ♀♀ Dingup (WAMP), coll.m.); 1 ♂ Namaaring (NMV); 1 ♀ W. Margaret River, Sedlacek (BMH); 3 ♀♀ Bridgetown, Darling Rgs., Lea (SAM); 1 ♂ W. Aust. (QM); 1 ♂ Mt. Tambourine, Oke (NMV: probably wrong locality—Neboiss i.l.).

Distribution: W. Australia.

24. **Stenus (Parastenus) guttulifer** Waterhouse, 1877

Stenus guttulifer, Waterhouse 1877, *Ent. mon. Mag.* 14: 24.
Stenus guttulifer, Fauvel 1877, *Mus. Civ. Stor. Nat. Genova* 10: 208 f.
Stenus guttulifer, Lea 1899, *Proc. Linn. Soc. N.S.W.* 23: 545.
Stenus guttulifer, L. Benick 1926, *Ent. Mitt.* 15: 278 f.

This species also is easy to identify by its narrow facies, confluent punctation and the small elytral spot which is somewhat variable in its width (Figs. 30–32).

♂ ventral abdomen moderately coarsely and moderately closely punctated. 8th sternite with a broad-triangular emargination in posterior eleventh (88: 10). 9th sternite apicolaterally moderately produced, in the middle shallowly concave. 10th tergite broadly rounded. Aedeagus (Fig. 22) inside with a remarkable, strongly sclerotized expulsation clasp. Parameres well extending beyond median lobe with some scattered setae at their ends.

♀ 8th sternite rounded, in middle distinctly produced.

Material examined: ♂ holotype and ♂ paratype N.S.W.: King George's Sound (BM); 1 ♀ ibidem (coll. Fauvel); 1 ♀ Sydney (coll. Fauvel); 2 ♂♂, 3 ♀♀ Qld (DASP); W. Australia: 2 ♂♂, 2 ♀♀ Albany (coll. Fauvel, coll.m.); 1 ♀ Margaret River, Darlington (MCZH); 1 ♂ W. Margaret River, Sedlacek (BMH); 1 ♀ Darlington, 450 ft, Ross and Cavagnaro (CAS); 1 ♀ Merivale Downs e. Esperance, Brown (coll.m.); 2 ♂♂, 3 ♀♀ Pemberton, Glanert (WAMP); 2 ♂♂ Mundaring (NMV); 3 ♂♂, 1 ♀ W. Australia (NMV, coll. Benick); 1 ♀ Donnybrook, W.A. (SAM); 2 ♂♂, 2 ♀♀ Swan River, Lea (SAM).

Regarding the internal structures of the aedeagus, *S. guttulifer* resembles *S. thalassinus* Puthz from New Guinea and *S. bifenestratus*.

Distribution: Australia.

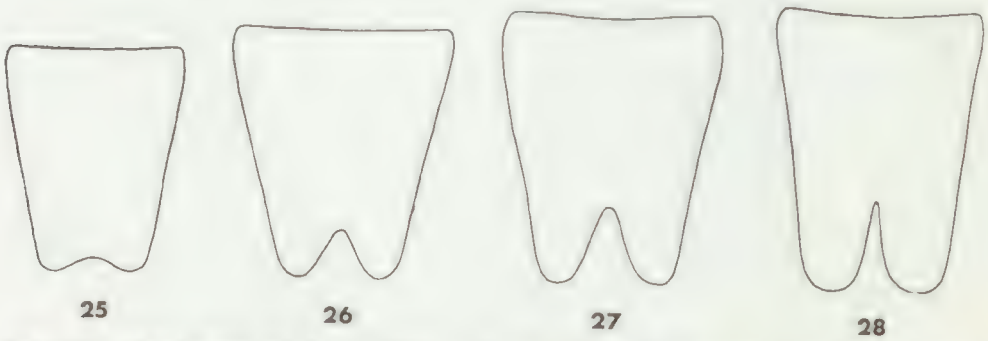

Fig. 25-28—8th sternite of ♂. 25: *Stenus olivaceus* Macleay (Gayndah). 26: *Stenus gayndahensis* Macleay (lectotype). 27: *Stenus coeruleus* Waterhouse (Cairns). 28: *Stenus pseudocoeruleus* n. sp. paratype). 25, 26 and 27, 28 same scale.

25. **Stenus (Parastenus) maculatus** Macleay, 1871

Stenus maculatus, Macleay 1871, *Trans. Ent. Soc. N.S.W.* 2(2): 148.
Stenus maculatus, Fauvel 1877, *Ann. Mus Civ. Stor. Nat. Genova* 10: 208.
Stenus maculatus, Fauvel 1878, *l.c.* 13: 405 f.
Stenus maculatus, Lea 1899, *Proc. Linn. Soc. N.S.W.* 23 (1898): 545.

This very remarkable species was often confounded with Fauvel's *pustulifer*, from which it is not easy to distinguish by general facies. The best characters of differentiation are the sexual characters:

♂ posterior trochanter with a sharp and prominent tooth, posterior femora with a striking enlargement in the middle, distinctly curved before it. 5th and 6th sternite with a distinct impression in posterior middle, sparser and finer punctated than on sides. 7th sternite shallowly impressed in basal middle, finely and moderately densely punctated and pubescent in posterior middle. 8th sternite with a moderately broad and deep rounded notch posteriorly. Aedeagus (Fig. 23) with the apical portion of the median lobe enlarged, its apex very broadly rounded. Parameres long spoon shaped.

♀ 8th sternite rounded, not or indistinctly produced in middle. Spermatheca strongly sclerotized, distinct. There are also some other distinctly sclerotized structures in the last segments: striking differences to those of *pustulifer* have not been found by me.

Material examined: 3 ♂♂, 1 ♀ syntypes from Gayndah (MLM) on two cards. ♂ lectotype: 1 Gayndah; 2 *Stenus maculatus* Macl., Gayndah; 3 ♂ lectotype: light/ Puthz 1969; 4 ♂ paralectotype left/Puthz 1969; 5 *Stenus maculatus* Macleay vid. V. Puthz 1969. Aedeagus of the lectotype extracted, lectotype lacks the right antenna. Paralectotypes 1 ♂, 1 ♀ ibidem, genitalia of female extracted.

N.S.W.: 1 ♀ Woy Woy (UMQ); 1 ♂, 3 ♀♀ Sydney, Du Boulay (NMV, coll. Fauvel, coll.m.); 1 ♂, 3 ♀♀ N.S.W. (NMV, DASP, coll. Fauvel); Qld: 10 ♂♂, 9 ♀♀ Brisbane, Illidge, Pottenger, Hacker, Wassell (UMQ, QM, CSIRO, coll. Benick, coll.m.); 1 ♀ Highvale, Teh (UMQ); 3 ♂♂ Mt. Glorious, Cribb (UMQ); 1 ♀ Sandgate, Diatloff (UMQ); 1 ♂ Ellis Beach, D. Smith (UMQ); 2 ♀♀ Sunnybank, Pottenger (QM); 1 ♂, 1 ♀ National Park, Hacker (QM); 1 ♀ Mt. Tambourine, Pottenger (QM); 4 ♂♂, 1 ♀ Mulgrave River, Hacker (DEI, coll.m.); 1 ♂ Kuranda, Carter (NMV); 2 ♂♂, 1 ♀ Blackall Rgs., Wilson (NMV, coll.m.); 1 ♀ Sth. Pine R., Brooks (BMH); 1 ♀ Mackay (NMV); 1 ♂, 3 ♀♀ Qld, Hacker (NMV, SAM); 1 ♀ Australia (NMV).

The normal facies of elytra and its spot shows Fig. 33. I also saw 1 ♀ from Malanda, N. Qld, G. F. Hill leg. (coll. Scheerpeltz) which differs from *maculatus* by its length (8·1 mm somewhat extended), finer and sparser abdominal punctation, and larger elytra (Fig. 34) having very close and regular rugae. Possibly this female represents a new species or subspecies. Before not knowing the male decision is impossible.

Distribution: N.S.W., Qld, mainly in localities of open forest dominated by *Eucalyptus*.

26. **Stenus (Parastenus) pustulifer** Fauvel, 1878

Stenus pustulifer, Fauvel 1878, *Ann. Mus. Civ. Stor. Nat. Genova* 13: 505.
(*Stenus degeneratus* Puthz i.l.)

This species was found confounded with *maculatus* in nearly all collections studied. Before not knowing the type I regarded it as a new one which I named "*degeneratus*" which should be corrected in some collections.

Because it is very similar to *maculatus*, and both species are also considerably variable, a determination only by regarding the general facies is difficult. Sure characters for differentiation are the sexual characters:

♂ posterior trochanter without or with a blunt tooth, posterior femora less enlarged in the middle than in *maculatus* not so strikingly curved before it. 5th and 6th sternite very slightly shallowed along middle, somewhat sparser and finer punctated than on sides. 7th sternite finely and moderately densely punctated in posterior middle. 8th sternite with a moderately narrow and deep rounded notch posteriorly. Aedeagus (Fig. 24) with the apical portion of the median lobe narrowed in proportion to basal

portion, narrowed and curved to the apex which is moderately narrowly rounded and button-shaped. Parameres triangularly narrowed to their apices.

♀ 8th sternite rounded, distinctly produced in middle. Spermatheca and internal structures resembling those of *maculatus* (see above). Elytra (Fig. 35).

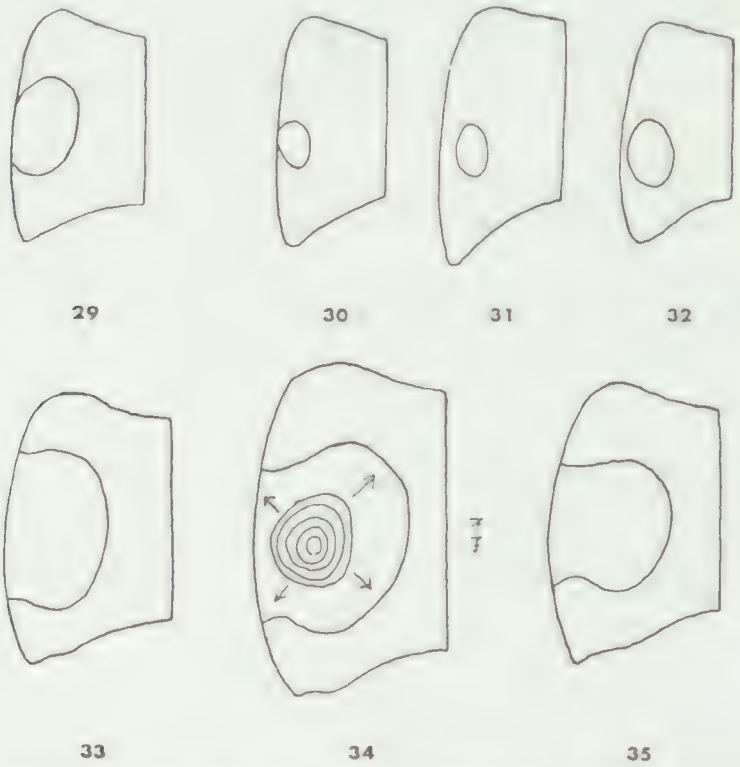

Fig. 29-35—Left elytra (same scale). 29: *Stenus bifenestratus* L. Benick (W. Aust.) 30-32: *Stenus guttulifer* Waterhouse (30: Albany, 31: Merivale, 32: W. Margaret River). 33:*Stenus maculatus* Macleay (Mulgrave River). 34: *Stenus* cf. *maculatus* Macleay (Malanda). 35: *Stenus pustulifer* Fauvel (Mt. Tomah).

Material examined: ♂ holotype N.S.W. (BM); V: 4 ♂♂ Warburton, Oke (NMV, coll.m.); 5 ♂♂, 9 ♀♀ Belgrave, Dixon (NMV, coll.m.); 1 ♂ Emerald, Oke (NMV); 1 ♂ Club Terrace, E. Vic., Monteith (UMQ); N.S.W.; 1 ♂ Otford (UMQ); 1 ♂, 2 ♀♀ Pt. Lockout via Ebor, 5200 ft, Cantrell (UMQ, coll.m.); 1 ♂ Ebor, Monteith (coll.m.); 1 ♀ (cf) Gosford, Carter (SAM); 1 ♀ Narara, Oke (NMV); 2 ♂♂, 2 ♀♀ Mt. Wilson, Carter (CSIRO, NMV); 1 ♀ (cf.) Barrington House via Salisbury, Monteith (UMQ); 2 ♂♂ Mt. Kiera via Wollongong, Monteith (UMQ, coll.m.); 1 ♀ Macquarie Pass via Wollongong, Monteith (UMQ); 1 ♂ Carrai Plateau via Kempsey, Monteith (UMQ); 2 ♂♂ Illawarra, Carter (NMV); 1 ♂, 1 ♀ Blue Mountains, Ferguson (CSIRO, coll.m.); 1 ♂ Mt. Irvine, Armstrong (coll. Steel); Qld: 1 ♀ Lamington National Park, Monteith (UMQ); 1 ♀ (cf.) Finchhatton Gorge via Finchhatton, Monteith (UMQ); 1 ♀ National Park, 3000 ft, Turner (QM); 1 ♀ (cf.) Crater Nt. Park via Ravenhoe, Cantrell (UMQ); 1 ♀ National Park, McPershon Range, 3–4000 ft, Darlington (MCZH); 1 ♀ Kuranda, Oke (NMV); 1 ♂ Australia (NMV).

Distribution: V, N.S.W., Qld, mainly from rainforest areas.

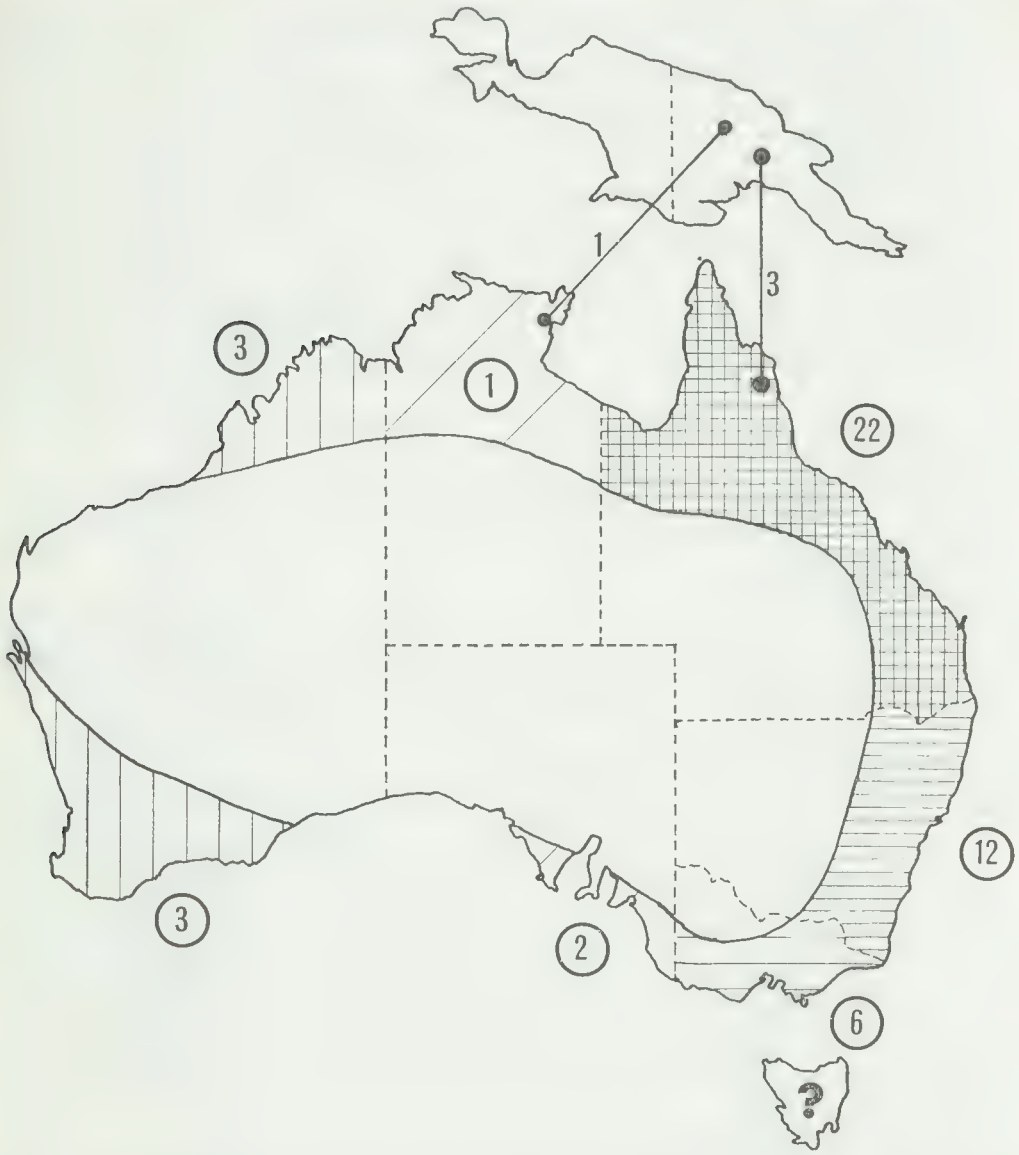

Fig. 36—Number of *Stenus* species occurring in the Australian provinces where average yearly rainfall is over 20 in. (cf. Paranomov 1959).

Key to the Australian Species of the Genus *Stenus* Latr.

1 (22) Abdomen completely margined throughout.
2 (15) Tarsi simple.
3 (6) Whole surface, especially that of abdomen, densely microsculptured.
4 (5) Elytra shorter and broader, on apical portion with distinct coppery shine, abdomen also coppery shining, aedeagus (fig. 3). 4·0-4·5 mm. W. Aust. . . . . *janthinipennis* Lea.
5 (4) Elytra longer and narrower with a greenish shine, not coppery, aedeagus (fig. 5). 3·6-3·9 mm. Qld. . . . . *retitogatus* sp. n.

6 (3) Surface lacks microsculpture or has only indistinct trace of a very shallow reticulation.
7 (12) Abdomen impunctate or very finely punctated, punctures at least as large as one eye facet.
8 (11) Middle of pronotum impunctate or with a nearly extinguished punctation.
9 (10) Elytra distinctly coppery. 9th sternite of ♂ (fig. 1), aedeagus (fig. 2). 4·0-4·8 mm. S. Aust., V, NSW, Qld. . . . . *cupreipennis* Macleay.
10 (9) Elytra black with a dark greenish tint, aedeagus (fig. 6). 3·4-4·0 mm. Qld. . . . . *atrovirens* Fauvel.
11 (8) Middle of pronotum distinctly punctated (but finer than on sides). Abdomen between the very fine punctures without any microsculpture. Elytra distinctly coppery. 4·2-4·4 mm. V, NSW, Qld. . . . . *puncticollis* Macleay.
12 (7) Punctation of abdomen distinctly coarser, punctures larger than one eye facet.
13 (14) 3rd segment of palpi black. 3·4-3·7 mm. W. Aust. . . *macellus* Fauvel.
14 (13) 3rd segment of palpi yellow. 8th sternite of ♂ (fig. 25), aedeagus (fig. 4). 4·0-4·3 mm. NSW, Qld. . . . . *olivaceus* Macleay.
15 (2) Tarsi bilobed.
16 (19) Elytra with smaller reddish yellowish spots.
17 (18) Narrower, elytral punctation confluent, spots smaller (figs. 30-32). Aedeagus (fig. 22). 5·0-6·0 mm. Australia. . . . *guttulifer* Waterhouse.
18 (17) Broader, more robust, elytral punctation very dense but not confluent, spots larger (fig. 29). Aedeagus (fig. 21). 4·8-5·8 mm. W. Aust. . . *bifenestratus* L. Benick.
19 (16) Elytra with very large yellowish reddish macules.
20 (21) Punctation of the fore-parts mostly regular, elytra (fig. 33). ♂ trochanter of hind legs with a sharp and prominent tooth, posterior femora strikingly enlarged in middle, 8th sternite's notch broader, aedeagus (fig. 23). ♀ 8th sternite rounded, not or indistinctly produced in middle. 6·0-7·8 mm. NSW, Qld. . . . . *maculatus* Macleay.
21 (20) Punctation of the fore-parts more irregular, tortuous-confluent on elytra (fig. 35). ♂ trochanter or hind legs without or with a blunt tooth, posterior femora less enlarged in middle, 8th sternite's notch narrower, aedeagus (fig. 24). ♀ 8th sternite rounded, distinctly produced in middle, 6·5-8·0 mm. V, NSW, Qld. . . . . *pustulifer* Fauvel.
22 (1) Abdomen not, or only the first and second segments very finely margined.
23 (34) Tarsi simple.
24 (27) Abdominal punctation extremely fine and sparse.
25 (26) Elytra with deep impressions, head distinctly narrower than elytra. 4·1 mm. V. . . . . *australicus* Blackburn.
26 (25) Elytra nearly even, head as broad or scarcely narrower than elytra, aedeagus (fig. 8). 4·0-4·7 mm. Qld. . . . . *neboissi* sp. n.
27 (24) Abdominal punctation coarse and differently close.
28 (29) Abdominal pubescence long and erect. ♂ parameres distinctly shorter than the median lobe. 5·0-5·5 mm. V, NSW, Qld, W. Aust. (?). . . . . *villosiventris* Lea.
29 (28) Abdominal pubescence fine and procumbent.
30 (31) Head as broad as elytra, these short, not longer than pronotum. ♂ sexual characters (cf. Puthz under press a). 4·0-4·7 mm. Qld, SE. New Guinea. . . . . *caviceps* Fauvel.

31 (30) Head distinctly narrower than elytra, these distinctly longer than pronotum.
32 (33) Punctation of front and abdomen coarse and dense, aedeagus (fig. 7). 4·7-5·7 mm. W. Aust. (Kimberley), Qld. . . *leai* Bernhauer et Schubert.
33 (32) Punctation of front finer and sparser, middle of front mostly smooth, abdomen moderately coarsely and sparsely punctated, median lobe very narrow. 4·8-5·3 mm. NSW, Qld. . . . . *convexiusculus* L. Benick.
34 (23) Tarsi bilobed.
35 (42) Smaller species, not blue/green/copper/violet-metallic.
36 (37) Whole surface extremely densely punctated, not shining. Aedeagus (cf. Puthz in press a). 2·8-3·2 mm. N. Aust., Qld, New Guinea, New Caledonia, Oriental Region. . . . . *cursorius cursorius* L. Benick.
37 (36) At least portions of front shining.
38 (41) Legs yellowish red with the knees narrowly infuscated.
39 (40) Punctation of the fore-parts denser, interspaces on elytra at least as large as half a puncture. 9th sternite of ♂ (fig. 10), 8th sternite (fig. 26), aedeagus (fig. 9). 3·5-4·1 mm. NSW, Qld. . *gayndahensis* Macleay.
40 (39) Punctation of the fore-parts sparser, interspaces on elytra often larger than half a puncture. ♂ 8th sternite (fig. 11, Puthz 1966). 9th sternite without an apical fork in middle. Aedeagus (figs. 11-14). 3·5-4·5 mm. V, Qld. . . . . *piliferus obesulus* Fauvel.
41 (38) Legs almost blackish brown. 4·5 mm. Horn Island. . . *hornensis* sp. n.
42 (35) Larger species, remarkable by their metallic colours.
43 (44) The whole abdomen distinctly microsculptured, its pubescence sparse and procumbent. 8th sternite of ♂ with a triangular notch in posterior sixth, aedeagus (fig. 16). 5·5-6·0 mm. Qld. . . . . *platythrix* sp. n.
44 (43) At least segments 3-6 without any microsculpture between the punctures, pubescence different in the following species.
45 (48) Abdominal pubescence erect, more distinct in *coeruleus* than in *pseudocoeruleus*.
46 (47) Whole abdomen lacks microsculpture between punctures, punctation of apical half of 5th sternite coarse and moderately dense, diameter of puncture larger than one medial eye facet. 8th sternite of ♂ (fig. 27). aedeagus (fig. 15). 5·0-6·0 mm. NSW, Qld. . . *coeruleus* Waterhouse.
47 (46) Tergites 7-10 distinctly microsculptured, punctation of apical half of 5th sternite fine and sparse, diameter of puncture at least as large as one medial eye facet. 8th sternite of ♂ (fig. 28), 9th sternite (fig. 18), aedeagus (fig. 17). 5·5-6·3 mm. NSW, Qld, NE. Papua (New Guinea). . . . . *pseudocoeruleus* sp. n.
48 (45) Abdominal pubescence procumbent.
49 (50) 7th-10th tergite very densely microsculptured, matt. Aedeagus (cf. Puthz in press b). 5·5-6·5 mm. New Guinea (perhaps also in NE. Australia). . . . . *coelestis* Fauvel.
50 (49) 7th-10th tergite with very shallow and sparse microsculpture, shining. Aedeagus (figs. 19, 20). 6·0-6·5 mm. Qld. . . . . *improbus* sp. n.

References

BENICK, L., 1916. Beitrag zur Kenntnis der Megalopinen und Steninen (Col., Staphyl.). *Ent. Mitt.* 5: 238-252.
———, 1921. Nomenklatorisches über Steninen (Col., Staph.). *l.c.* 10: 191-194.
———, 1928. Alte u.neue Steninen aus Australien u.Ozeanien (Col., Staph.). *l.c.* 17: 177-182.
———, 1938. F. C. Drescher's Steninen-Sammlungen von Java und Bali (Col., Staph.). *Stett. ent. Ztg.* 99: 1-49.

Bernhauer, M., et Schubert, K., 1911. Coleoptm Cat. (Junk Schenkling) pars 29.
Blackburn, Th., 1891. Notes on Australian Coleoptera with descriptions of new species. Part IX. *Proc. Linn. Soc. N.S.W.* (2) 5 (1890): 775-790.
Fauvel, A., 1877. Les Staphylinides de l'Australie et de la Polynésie. *Annali Mus. civ. Stor. nat. Genova* 10: 168-298.
———, 1878. Idem II. *Ibid.* 13: 465-598.
———, 1889. Les Coléoptères de la Nouvelle Calédonie et dépendances avec descriptions, notes et synonymies nouvelles (suite). *Revue Ent.* 8: 242-271.
———, 1903. Faune analytique des Coléoptères de la Nouvelle-Calédonie. *Revue Ent.* 22: 203-379.
Gressitt, J. L., 1961. Problems in the zoogeography of Pacific and Antarctic insects. *Pacif. Insects Monogr.* 2: 1-94.
Hedley, C., 1894. The faunal regions of Australia. *Rep. Australas. Ass. Advmt. Sci.* 5: 444-446.
Hennig, W., 1965. Phylogenetic systematics. *A. Rev. Ent.* 10: 97-116.
Keast, A, 1959. The Australian environment, in *Biogeography and Ecology in Australia, Monogr. biol.* 8: 15-35.
Lea, A. M., 1899. Descriptions of Australian Coleoptera V. *Proc. Linn. Soc. N.S.W.* 23 (1898): 521-645
Macleay, W. J., 1871. Notes on a collection of insects from Gayndah. *Trans. ent. Soc. N.S.W.* 2 (2): 79-205.
Paranomov, S. J., 1959. Zoogeographical aspects of the Australian dipterofauna. *Monogr. biol.* 8: 164-191.
Puthz, V., 1966. Dois anos de colheitas em Timor Portuguẽs por Raul do Nascimento Ferreira. 2. Coleoptera, Polyphaga: Staphylinidae: Steninae. 38. Beitrag zur Kenntnis der Steninen. *Mems. Estud. Mus. zool. Univ. Coimbra* 297: 1-24.
———, 1967. Über *Stenus (Parastenus) alpicola* Fauvel und andere abweichend gebaute paläarktische Parastenus-Arten (Coleoptera, Staphylinidae). 44. Beitrag zur Kenntnis der Steninen. *Ann. Ent. Fenn.* (= *Suom hyönt. Aikak.*) 33: 226-256.
———, 1968. Die *Stenus*-und *Megalopinus*-Arten Motschulskys und Bemerkungen über das Subgenus *Tesnus* Rey, mit einer Tabelle der paläarktischen Vertreter (Coleoptera, Staphylinidae) (54. Beitrag zur Kenntnis der Steninen). *Notu. ent.* 48: 197-219.
———, in press. a. Revision der äthiopischen Steninenfauna und Allgemeines über die Gattung *Stenus* Latr. (Coleoptera, Staphylinidae). 56. Beitrag zur Kenntnis der Steninen. *Annls. Mus. r. Afr. cent.*
———, ———. b. Revision der Fauvelschen *Stenus*-Arten, exklusive madagassische Arten. 55. Beitrag zur Kenntnis der Steninen. *Bull. Inst. r. Sci. nat. Belg.*
———, ———. c. The Noona-Dan Expedition, 1961-62. Coleoptera: Staphylinidae: Steninae. 63. Beitrag zur Kenntnis der Steninen. *Ent. Meddr.*
———, ———. d. The first *Stenus*-species from the Solomons (Coleoptera: Staphylinidae). *Pacif. Insects* 11.
———, ———. e. Zwei neue *Stenus*-Arten aus dem Kaukasus nebst synonymischen Bemerkungen zu anderen Arten (Coleoptera, Staphylinidae). 66. Beitrag zur Kenntnis der Steninen. *Mitt. zool. Mus. Berl.* 46.
———, ———. f. Two remarkable *Stenus* from New Guinea in the collection of the S. Australian Museum (Coleoptera, Staphylinidae). 68th contribution to the knowledge of Steninae. *Mem. nat. Mus. Vict.*
———, ———. g. Uber Steninen aus dem Museo Civico di Storia Naturale di Genova (Coleoptera, Staphylinidae). 69. Beitrag zur Kenntnis der Steninen. *Annali Mus. civ. Stor. nat. Genova.*
Scheerpeltz, O., 1933. Coleoptm Cat. pars 129.
Toxopeus, L. J., 1950. The geological principles of species evolution in New Guinea (A study on parallelisms in geological and lepidopterological development). *Proc. 8th Int. Congr. Ent.* 508-522.
Troughton, E. le G., 1959. The marsupial fauna: its origin and radiation. *Monogr. biol.* 8: 69-88.
Waterhouse, Ch., 1877. Descriptions of new Coleoptera from various locations. *Entomologists mon. Mag.* 14: 23-38 (cont.).

CATALOGUE OF CHITON (AMPHINEURA, MOLLUSCA) TYPES IN THE NATIONAL MUSEUM OF VICTORIA, AUSTRALIA

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Abstract

Details of the type specimens of 39 species of chitons held by the National Museum are given. These include primary types of 16 species. All are listed by their original genera.

Introduction

The extensive collection of chitons in the National Museum contains type material of 39 species, including primary types of 16 species, the remainder being secondary types. Although the general reference collection contains two large comprehensive chiton collections (the A. F. Basset Hull Collection purchased in 1946 and the J. S. Mackay Collection bequeathed in 1934), the types of most of the species they described were lodged elsewhere prior to the Museum's acquisition of these collections.

In the latter part of last century J. Bracebridge Wilson carried out a faunal survey of the lower part of Port Phillip Bay, Victoria, under the sponsorship of the Royal Society of Victoria. The chitons from this survey were described by E. R. Sykes, including six new species, the types of which were originally lodged in the Museum of the Melbourne University Zoology Department. However, they were transferred to the National Museum on 28 January 1931. The MUZD Reg. Nos. are given with these species. Most of the remaining types, and especially those of the species represented by secondary types only, were obtained as part of the Hull Collection. However, because of the potential importance of the knowledge of the source collection, and the large number of such collections contributing specimens to this list, the source is given with each species.

The original generic names are used, arranged alphabetically, and under each genus the specific names are so arranged. All the specimens are dry unless otherwise stated. Where the valves have not been disarticulated, the specimens are described either as *entire* (for specimens with only the valves and girdle present) or *entire with animal,* for specimens when the dried body is also present. Where species have been synonymized in subsequent revisions, the currently accepted status is recorded with its authority.

The following abbreviations are used in the text for States: Vict. = Victoria, Tasm. = Tasmania, Qd. = Queensland, N.S.W. = New South Wales, West. Aust. = Western Australia, S. Aust. = South Australia; and for Museums: AM = Australian Museum, Sydney; AIM = Auckland Institute and Museum, New Zealand; DM = Dominion Museum, Wellington, New Zealand; MCZ = Museum of Comparative Zoology, Harvard University, U.S.A.; QM = Queensland Museum; SAM = South Australian Museum; TM = Tasmanian Museum; WAM = Western Australian Museum.

Genus **Acanthochites** Risso, 1826

Acanthochites (Notoplax) glyptus Sykes, 1896

Proc. malac. Soc. Lond. 2: 92, pl. 6, figs. 5-5a.

Holotype: F680, entire specimen with animal, with three valves separated from it (Old Reg. 61900).

PARATYPE: F27307, one entire specimen found with the holotype (Old Reg. 61901).

LOCALITY: Port Phillip Bay, Vict., collected J. B. Wilson.

NOTES: MUZD 906.

Acanthochites leuconotus Hedley & Hull, 1912

Proc. Linn. Soc. N.S.W. 37: 275, pl. 12, figs. 4a-f.

PARATYPE: F27308, one entire specimen with animal (Holotype in AM C33118).

LOCALITY: Lord Howe Island.

NOTES: Specimen from Hull, in Gabriel Coll.

Acanthochites pilsbryi Sykes, 1896

Proc. malac. Soc. Lond. 2: 91, pl. 6, figs. 6, 6a.

HOLOTYPE: F678, entire specimen with animal, valves damaged (Old Reg. 61899).

LOCALITY: Port Phillip Bay, Vict., collected J. B. Wilson.

NOTES: MUZD 903.

Acanthochites (Notoplax) wilsoni Sykes, 1896

Proc. malac. Soc. Lond. 2: 92, pl. 6, figs. 2, 2a.

HOLOTYPE: F679, entire specimen with animal, with three valves separated (Old Reg. 61902).

LOCALITY: Port Phillip Bay, Vict., collected J. B. Wilson.

NOTES: MUZD 907.

Genus **Acanthochiton** Herrmannsen, 1846

Acanthochiton complanatus Hull, 1925

Proc. R. Soc. Qd. 36: 112, pl. 21, figs. 2a-c.

PARATYPES: F17979, three entire specimens with animals. F15155, one entire specimen with animal (Holotype in QM Mo1138).

LOCALITY: Magnetic Island, Townsville, Qd.

NOTES: From Hull Coll., original label missing from F15155.

Acanthochiton crocodilus debilior Iredale & Hull, 1925

Aust. Zool. 4: 87, pl. 10, fig. 13.

PARATYPE: F15124, one entire specimen with animal (Holotype in AM C51554).

LOCALITY: Bottle and Glass Rocks, Vaucluse, N.S.W.; in description 'Port Jackson and Shellharbour'.

NOTES: From Hull Coll., original label missing.

Acanthochiton (Notoplax) gabrieli Ashby, 1922

Trans. R. Soc. S. Aust. 46: 10, pl. 3, fig. 3.

HOLOTYPE: F447, entire specimen with animal (Old Reg. 71195).

LOCALITY: Caloundra, Qd., collected Gatliff.

NOTES: From Gatliff Coll.

Acanthochiton gatliffi Ashby, 1919

Trans. R. Soc. S. Aust. 43: 398, pl. 42, figs. 2-5.

PARATYPES: F27309, F27310, two entire specimens with animal (Holotype in SAM D12189).

LOCALITY: Port Lincoln, S. Aust. (type locality) and Point Cook, Port Phillip Bay, Vict., dredged in 8 fm on a tunicate (F27309, F27310).

NOTES: F27309 from Gatliff Coll.; F27310 from Gabriel Coll.

Acanthochiton macrocystialis Ashby, 1924

Trans. R. Soc. S. Aust. 48: 324, pl. 31, figs. 3a-c.

PARATYPES: F16717, two entire specimens. F17984, one entire specimen (Holotype in SAM D10704).

LOCALITY: Point Puer, Port Arthur, Tasm., living on the roots of the alga *Macrocystis pyrifera.*

NOTES: F16717 from Hull Coll.; F17984 from Gatliff Coll.

Acanthochiton thackwayi Ashby, 1924

Trans. R. Soc. S. Aust. 48: 318, pl. 31, figs. 1-2.

PARATYPES: F17978, two entire specimens (Holotype in SAM D10716).

LOCALITY: Shellharbour, N.S.W.; in description 'Fly Point, Port Stephens, N.S.W.', collected Ashby.

NOTES: From Hull Coll.

Acanthochiton zealandicus doubtlessensis Ashby, 1926

Proc. malac. Soc. Lond. 17: 12, pl. 1, figs. 2a-c; pl. 2, fig. 6.
= *Acanthochiton zealandicus hookeri* (Gray 1843) after Iredale and Hull 1930.

PARATYPE: F16376, one entire specimen (Holotype in SAM D11109).

LOCALITY: Doubtless Bay, North Island, New Zealand.

NOTES: From Hull Coll.

Genus **Callistelasma** Iredale & Hull, 1925

Callistelasma periousia Iredale & Hull, 1925

Aust. Zool. 3: 353, pl. 40, fig. 8.

PARATYPES: F15560, two entire specimens (Holotype in QM Mo1209).

LOCALITY: Grassy Island, Whitsunday Group, Qd., collected Hull, May 1924.

NOTES: From Hull Coll.

Genus **Chiton** Linnaeus, 1758

Chiton inornatus Tenison-Woods, 1881

Trans. Roy. Soc. Vict. 17: 82, figs. 8-9.

HOLOTYPE: F637, entire specimen (Old Reg. 44690).

LOCALITY: Launceston, Tasm.

NOTES: Donated by Tenison-Woods on 12 November 1880. Iredale and Hull stated that the type was in the TM, but that institution holds no types of this species.

Chiton marmoreus var. coeruleus Winkley, 1894

Nautilus 8: 78, not figured.

PARATYPE: F16715, one entire specimen (Holotype in MCZ, MCZ 32856).

LOCALITY: Eastport, Maine, U.S.A.

NOTES: From Hull Coll., original label is on MCZ label. The number 1707 is written on the shell; its significance is not known.

Genus **Componochiton** Milne, 1963

Componochiton raceki Milne, 1963

J. malac. Soc. Aust. 7: 25, figs. 1-5.

PARATYPE: F23568, dry disarticulated valves of one specimen and the girdle and animal in spirit (Holotype in AM C63297).

LOCALITY: Port Stephens, N.S.W., from 75 fm, collected Racek on 3 July 1959 on 'Challenge'.

Genus **Enoplochiton** Gray 1847

Enoplochiton torri Bastow & Gatliff, 1907

Proc. Roy. Soc. Vict. 20: 27, pl. 3-4, figs. 1-12.
= *Squamopleura curtisiana* (Smith 1884) after Iredale and Hull 1927.

HOLOTYPE: F16375, disarticulated valves (Old Reg. 62655).

PARATYPES: F16374, two entire specimens with animals. F17986, one entire specimen and two entire specimens with animals.

LOCALITY: Qd., collected Torr.

NOTES: F16375 from Bastow Coll., F17986 from Gatliff Coll.

Genus **Glyptelasma** Iredale & Hull, 1925

Glyptelasma matthewsi occidentalis Iredale & Hull, 1925

Aust. Zool. 4: 95, pl. 11, figs. 18, 20.

PARATYPE: F15164, one entire specimen (Holotype in WAM 11660).

LOCALITY: Middleton Beach, King George Sound, West. Aust., collected Hull.

NOTES: From Hull Coll.

Genus **Ischnochiton** Gray, 1847

Ischnochiton acomphus Hull & Risbec, 1930

Aust. Zool. 6: 278, pl. 20, figs. 1-8, text figs. 1-24.

HOLOTYPE: F16711, entire specimen.

PARATYPE: F27311, disarticulated valves of one specimen.

LOCALITY: Baie de l'Orphelinat, Noumea, New Caledonia; the paratype bears only the locality 'New Caledonia'.

NOTES: From Hull Coll.

Ischnochiton araucarianus Hedley, 1898

Proc. Linn. Soc. N.S.W. 23: 100, text figs. 3-6.
= *Squamopleura miles* (Pilsbry 1893) after Iredale and Hull 1927.

PARATYPE: F16712, one entire specimen with animal (Holotype in AM C4344).

LOCALITY: Isle of Pines, New Caledonia, collected Hedley, October 1887.

NOTES: From Hull Coll.; the data is on a label bearing AM No. C4344.

Ischnochiton atkinsoni brunyensis Ashby, 1927

Pap. Proc. R. Soc. Tasm. 1926 (1927): 111, not figured.

PARATYPES: F16710, two entire specimens with animals (Holotype in SAM D11966).

LOCALITY: South Bruny Island, Tasm.

NOTES: From Hull Coll.

Ischnochiton atkinsoni lincolnensis Ashby, 1920

Trans. R. Soc. S. Aust. 44: 275, pl. 12, figs. 5a-b.
= *Ischnochiton variegatus* (Adams and Angas 1864) after Iredale and Hull 1927.

PARATYPE: F17988, one entire specimen with animal (Holotype in SAM D11763).

LOCALITY: San Remo, Vict.

Ischnochiton (Isochiton) bardwelli Ashby & Cotton, 1934

J. Proc. R. Soc. West. Aust. 20: 217, pl. 13, fig. 5.

HOLOTYPE: F17977, entire specimen.

LOCALITY: Broome, West. Aust., collected Bardwell.

NOTES: From Bardwell Coll.

Ischnochiton crispus var. decorata Sykes, 1896

Proc. malac. Soc. Lond. 2: 87, not figured.
= *Ischnochiton elongatus* (Blainville 1825) after Iredale and Hull 1927.

HOLOTYPE: F683, entire specimen with animal (Old Reg. 61903).

LOCALITY: Port Phillip Bay, Vict., collected J. B. Wilson.

NOTES: MUZD 890.

Ischnochiton examinandus laetior Hull, 1923

Aust. Zool. 3: 160, pl. 24, figs. 14-17.

PARATYPES: F13084, four entire specimens. F13085, ditto. F15158, one entire specimen (Holotype in AM C49543).

LOCALITY: Caloundra (F13084, F15158) and Point Cartwright (F13085), Qd.

NOTES: All from Hull Coll. The original label is missing from F15158.

Ischnochiton falcatus Hull, 1912

Proc. Roy. Soc. Vict. 25: 121, pl. 8.

HOLOTYPE: F732, entire specimen with animal.

PARATYPE: F27312, disarticulated valves of one specimen in box with holotype.

LOCALITY: Western Port Bay, Vict., dredged in 6-8 fm between Phillip and French Islands by Gabriel.

NOTES: A label with the paratype states '3 valves figured'.

Ischnochiton gabrieli Hull, 1912

Proc. Roy. Soc. Vict. 25: 120, pl. 8, figs. 1a-f.

HOLOTYPE: F733, entire specimen.

PARATYPE: F27313, disarticulated valves of one specimen in box with holotype.

LOCALITY: Western Port Bay, Vict., dredged in 6-8 fm between Phillip and French Islands by Gabriel.

NOTES: A label with the paratype states '3 valves figured'.

Ischnochiton (Haploplax) pura Sykes, 1896

Proc. malac. Soc. Lond. 2: 88, pl. 6, figs. 3, 3a.

HOLOTYPE: F681, entire specimen with animal, one valve missing (Old Reg. 61894).

PARATYPES: F27314, two entire specimens with animals (Old Reg. 61895-6).

LOCALITY: Port Phillip Bay, Vict., collected J. B. Wilson.

NOTES: MUZD 897.

Ischnochiton wilsoni Sykes, 1896

Proc. malac. Soc. Lond. 2: 89, pl. 6, figs. 1, 1a.

HOLOTYPE: F682, entire specimen with animal, two valves separated (Old Reg. 61897).

PARATYPE: F27315, one entire specimen with animal (Old Reg. 61898).

LOCALITY: Port Phillip Bay, Vict., collected J. B. Wilson.

NOTES: MUZD 898.

Genus **Ischnoradsia** Shuttleworth, 1853

Ischnoradsia australis divaricata Hull, 1923

Aust. Zool. 3: 196, pl. 27, figs. 1a-c.

SYNTYPE: F17976, one entire specimen (see notes).

LOCALITY: Point Cartwright, Qd., collected Hull.

NOTES: From Hull Coll. and noted 'type' in pencil on a label. However, Iredale and Hull (1927) state that the type is in the QM. This latter institution does hold three specimens labelled *Ischnoradsia australis* collected by Hull in August 1922 (the date of collection for the type material of this subspecies). These three specimens could be syntypes of this subspecies.

Genus **Kopionella** Ashby, 1919

Kopionella tasmanica Ashby, 1920

Trans. R. Soc. S. Aust. 44: 268, pl. 11, figs. 1a-c.
= *Kopionella matthewsi* (Iredale 1910) after Iredale and Hull 1927.

PARATYPE: F16720, one entire specimen with animal (Holotype presumed lost, see notes).

LOCALITY: D'Entrecasteaux Channel, Tasm.

NOTES: From Hull Coll. The type could not be found in the TM, AM, or SAM and is presumed lost.

Genus **Lepidopleurus** Risso, 1826

Lepidopleurus badius Hedley & Hull, 1909

Rec. Aust. Mus. 7: 260, pl. 73, figs. 1-2.

PARATYPES: F16404, two entire specimens (Holotype in AM C30459).

LOCALITY: Long Reef, Manly, N.S.W.; a note with the specimens states 'Found in one place only, in cluster of about 15 on under surface of stone in shallow water'.

NOTES: From Hull Coll.

Genus **Lorica,** H. & A. Adams, 1852

Lorica paucipustulosa Hull, 1923

Aust. Zool. 3: 197, pl. 27, fig. 3.

PARATYPE: F16088, one entire specimen (Holotype in WAM 11659).

LOCALITY: Rabbit Island, King George Sound, West. Aust.

NOTES: From Hull Coll.

Genus **Lucilina** Dall, 1882

Lucilina tilbrooki Milne, 1958

Proc. R. zool. Soc. N.S.W. 1956-1957 (1958): 152, figs. 1-4.

HOLOTYPE: F18471, entire specimen with animal.

PARATYPE: F18061, disarticulated valves of one specimen.

LOCALITY: Heron Island, Qd.

Genus **Notoplax** Adams, 1862

Notoplax (Amblyplax) mariae haurakiensis Ashby, 1926

Proc. malac. Soc. Lond. 17: 26, pl. 2, figs. 3a-c.
= *Notoplax mariae* (Webster 1908) after Iredale and Hull 1931.

PARATYPES: F16755, two entire specimens (Holotype of 3 valves only in AIM, TM 535).

LOCALITY: Hauraki Gulf, N.Z., dredged in 20 fm between Tiri-Tiri and Kawan Islands on dead *Atrina* shells.

NOTES: From Hull Coll.

Notoplax (Amblyplax) oliveri Ashby, 1926

Proc. malac. Soc. Lond. 17: 18, pl. 1, figs. 4a-c.
= *Craspedochiton rubiginosus* (Hutton 1872) after Iredale and Hull 1931.

PARATYPES: F16713, two entire specimens (Holotype in DM M1585).

LOCALITY: Hauraki Gulf, N.Z., dredged in 20 fm between Tiri-Tiri and Kawan Islands on dead *Atrina* shells.

NOTES: From Hull Coll.

Notoplax rottnestensis Ashby, 1929

J. Proc. R. Soc. West. Aust. 15: 47, figs. 10-13.

PARATYPE: F16718, one entire specimen (Holotype in WAM 12880).

LOCALITY: Bathurst Point, Rottnest Island, West. Aust., collected by Glauert.

NOTES: From Hull Coll.

Genus **Onithella** Mackay, 1933

Onithella helenae Mackay, 1933

Aust. Zool. 7: 345, pl. 18, figs. 1-13, text figs. 15b, 16b.

HOLOTYPE: F970, entire specimen (Mackay 3676).

PARATYPES: F969, disarticulated valves of one specimen (Mackay 3677), F27316, a slide of the girdle of this specimen. F17980, one entire specimen.

LOCALITY: Alma Bay, Magnetic Island, Qd.

NOTES: F17980 from Hull Coll.

Genus **Stenochiton** Adams & Angas, 1864
Stenochiton pilsbryanus dilatus Iredale & Hull, 1924

Aust. Zool. 3: 287, pl. 36, fig. 11.

PARATYPES: F16089, ten entire specimens (Holotype in WAM 11658).

LOCALITY: Quarantine Station, Albany, West. Aust.

NOTES: From Hull Coll.

Genus **Terenochiton** Iredale, 1914
Terenochiton erratus Hull, 1923

Aust. Zool. 3: 159, pl. 24, figs. 6-9.

PARATYPES: F17982, two entire specimens with animals (Holotype in AM C49541).

LOCALITY: Rabbit Island, King George Sound, West. Aust.

NOTES: From Hull Coll.

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References

ASHBY, E., 1919. Descriptions of six new species of Australian Polyplacophora (four Acanthochitons and two Callistochitons), with other notes. *Trans. R. Soc. S. Aust.* 43: 394-404.
————, 1920a. Chitons of the D'Entrecasteaux Channel, Southern Tasmania. Including additions to the Tasmanian fauna, and descriptions of a new species and a new variety. *Trans. R. Soc. S. Aust.* 44: 263-271.
————, 1920b. A review of *Chiton crispus* Reeve (Order Polyplacophora) and its allies, with proposed recognition of Blainville's *Chiton lineolatus*, and description of three new species. *Trans. R. Soc. S. Aust.* 44: 272-282.
————, 1922. Notes on Australian Polyplacophora with descriptions of three new species and two new varieties. *Trans. R. Soc. S. Aust.* 46: 9-22.
————, 1924a. The chiton fauna (Polyplacophora) of Port Stephens, New South Wales. *Trans. R. Soc. S. Aust.* 48: 312-322.
————, 1924b. Further notes on Australian Polyplacophora with descriptions of three new species. *Trans. R. Soc. S. Aust.* 48: 323-327.
————, 1926. The Acanthoid chitons of New Zealand, with descriptions and figures, including several new species. *Proc. malac. Soc. Lond.* 17: 5-34.
————, 1927. Notes on, and additions to, the chiton fauna of north-west Tasmania, together with a brief review of the genus Stenochiton. *Pap. Proc. R. Soc. Tasm.* 1926: 92-117.
————, 1939. Contributions to the fauna of Rottnest Island. *J. Proc. R. Soc. West. Aust.* 15: 47-54.
———, and COTTON, B. C., 1934. New species of chiton from Broome, Western Australia. *J. Proc. R. Soc. West. Aust.* 20: 213-219.
BASTOW, R. A., and GATLIFF, J. H., 1907. New species of Australian chiton from Queensland, *Enoplochiton torri*. *Proc. Roy. Soc. Vict.* 20: 27-30.
HEDLEY, C., 1898. Descriptions of new mollusca, chiefly from New Caledonia. *Proc. Linn. Soc. N.S.W.* 23: 97-105.
————, and HULL, A. F. B., 1909. Descriptions of new and notes on other Australian Polyplacophora. *Rec. Aust. Mus.* 7: 260-266.
————, ————, 1912. The Polyplacophora of Lord Howe and Norfolk Islands. *Proc. Linn. Soc. N.S.W.* 37: 271-281.
HULL, A. F. B., 1912. Description of two new Ischnochitons from Western Port, Victoria. *Proc. Roy. Soc. Vict.* 25: 120-121.
————, 1923. New Australian Polyplacophora, and notes on the distribution of certain species. *Aust. Zool.* 3: 157-166.
————, 1923. New Australian Loricata and notes on the distribution of certain species. 1. *Aust. Zool.* 3: 195-201.

————, 1925. New Queensland Loricates (Phylum Mollusca, Order Loricata). *Proc. R. Soc. Qd.* 36: 109-116.
————, and Risbec, J., 1930. The Loricates of the New Caledonian region (Class Mollusca —Order Loricata). *Aust. Zool.* 6: 277-286.
Iredale, T., and Hull, A. F. B., 1924. A monograph of the Australian Loricates (Phylum Mollusca—Order Loricata) III. *Aust. Zool.* 3: 277-297.
————, 1925. A monograph of the Australian Loricates (Phylum Mollusca—Order Loricata) IV. *Aust. Zool.* 3: 339-362.
————, 1925. A monograph of the Australian Loricates (Phylum Mollusca—Order Loricata) V. *Aust. Zool.* 4: 75-111.
————, 1927. A monograph of Australian Loricates (Phylum Mollusca—Order Loricata). *Royal Zoological Society of New South Wales.* Sydney pp. 1-168.
————, 1930. The Loricates of the Neozelanic Region. *Aust. Zool.* 6: 157-168.
————, 1931. The Loricates of the Neozelanic Region. *Aust. Zool.* 7: 59-76.
Mackay, J. S., 1933. A new Loricate from North Queensland. *Aust. Zool.* 7: 345-348.
Milne, K. L., 1958. Descriptions of new species of chitons (Mollusca, Loricata). *Proc. R. zool. Soc. N.S.W.* 1956-57: 152-155.
————, 1963. A new deep-water chiton (Polyplacophora: Chitonidae) from Eastern Australia. *J. malac. Soc. Aust.* 7: 25-27.
Sykes, E. R., 1896. Report on a collection of Polyplacophora from Port Phillip, Victoria. *Proc. malac. Soc. Lond.* 2: 84-93.
Tenison-Woods, J. E., 1881. On some new marine Mollusca. *Trans. Proc. Roy. Soc. Vict.* 17: 80-83.
Winkley, H. W., 1894. Eastport Notes. *Nautilus* 8: 78-79.

CATALOGUE OF ECHINODERM TYPES IN THE NATIONAL MUSEUM OF VICTORIA, AUSTRALIA

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Abstract

Type specimens of twenty-four species of echinoderms from all five classes are listed. They include paratypes of species described by H. L. Clark (1938), syntypes of echinoid species described by Tenison-Woods, type series of species described by A. M. Clark (1966), holothurian types described by Joshua and the type of one holothurian from Macquarie Island described by Pawson.

Introduction

The echinoderm type material held in the National Museum of Victoria comes from five sources and contains mainly secondary type material. No major work on the phylum has been carried out at the Museum and no major collection of echinoderms from a leading worker in the field has been acquired by the Museum.

In March 1880 the Rev. J. E. Tenison-Woods donated a large collection of invertebrates to the Museum including syntypes of three species of echinoids he had described in the previous year. In the first 20 years of this century a local amateur naturalist, E. C. Joshua, carried out some collecting and taxonomic work on holothurians from southern Australia. By himself and in association with E. Creed from South Australia he described several new species. In 1938 H. L. Clark of the Museum of Comparative Zoology, Harvard University, U.S.A., donated paratypes of seven of the new species he described from his extensive collecting expedition to Australia.

Dr D. L. Pawson, Curator of Echinoderms at the Smithsonian Institution, U.S.A., lodged the type of a new holothurian collected by Miss J. H. Macpherson, a member of the Museum staff, from Macquarie Island in 1959. Finally Dr A. M. Clark of the British Museum described four new species collected on the Survey of Port Phillip Bay, Victoria, carried out between 1957 and 1963 jointly by the Museum and the Fisheries and Wildlife Department.

The 24 species are divided into classes with the original genera arranged alphabetically with the species so arranged. Where the species is represented by a secondary type, the location of the primary type is given. The abbreviations for States are as follows: Vict. = Victoria, W. Aust. = Western Australia, Qd. = Queensland, and for other museums are as follows: MCZ = Museum of Comparative Zoology, Harvard, U.S.A., AM = Australian Museum, SAM = South Australian Museum.

Class Crinoidea

Genus **Aporometra** Clark, 1938

Aporometra occidentalis Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 43, not figured.

Paratypes: H117, two dry specimens (holotype in the MCZ).

Locality: Koombana, Bay, Bunbury, W. Aust., 5-8 fm, collected October 1929.

Class Asteroidea

Genus **Asterina** Nardo, 1834

Asterina alba Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 150, pl. 22, fig. 7.

Paratypes: H118, two dry specimens (holotype in the MCZ).

Locality: Neds Beach, Lord Howe Island, collected April 1932.

Asterina lutea Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 153, pl. 12, fig. 2.

Paratype: H119, one dry specimen (holotype in the MCZ).

Locality: Entrance Point, Broome, W. Aust., under stones, collected August 1929.

Genus **Echinaster** Mueller & Troschel, 1840

Echinaster varicolor Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 184, pl. 11, fig. 1.

Paratype: H120, one dry specimen (holotype in the MCZ).

Locality: SW. of Broome, W. Aust., in 5-8 fm, collected June 1932.

Genus **Nepanthia** Gray, 1840

Nepanthia hadracantha Clark, 1966

Mem. nat. Mus. Vict. 27: 320, pl. 3, figs. 4-6, text figs. 3a-b.

Holotype: H14, in spirit.

Locality: Cape Schank, Vict., collected 8 June 1961.

Other Specimens: H121, one specimen in spirit collected with the holotype at Cape Schank but not included as a type.

Nepanthia variabilis Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 176, pl. 10, figs. 4-5; pl. 20, figs. 4-5.

Paratype: H122, one dry specimen (holotype in the MCZ).

Locality: Broome, W. Aust., collected August 1929.

Class Ophiuroidea

Genus **Amphiura** Forbes, 1843

Amphiura clandiformis Clark, 1966

Mem. nat. Mus. Vict. 27: 331, text figs. 6f-i.

Holotype: H40, disc and two arm fragments only, in spirit.

Paratype: H123, one complete specimen, except for the ends of three arms broken.

Locality: Port Phillip Bay, Vict. (Area 32—sample site 277).

Notes: The paratype was not designated as such in the materials section of the description but was mentioned in the paper as such. This specimen was located with the holotype in the collections but not mentioned in the museum register.

Other Specimens: H124, one entire specimen in spirit from Port Phillip Bay, Vict. (Area 33). H125, one broken specimen in spirit from Port Phillip Bay, Vict. (Area 47). H126, one entire specimen in spirit from Port Phillip Bay, Vict. (Area 43). H127, one entire specimen in spirit from Port Phillip Bay, Vict. (Area 61). Fragments of several specimens from Port Phillip Bay, Vict. (Area 20), H128, and Areas 11, 12 and 13 (H129).

Amphiura (Ophiopeltis) parviscutata Clark, 1966

Mem. nat. Mus. Vict. 27: 337, text fig. 8.

HOLOTYPE: H17, in spirit with arms coiled.

LOCALITY: Port Phillip Bay, Vict., near Mornington (Area 55—sample site 147).

NOTES: Due to a printer's error the genus name in the original description was mis-spelt '*Amphuira*'.

OTHER SPECIMENS: H130, two entire specimens from Port Phillip Bay, Vict. (Area 27). H131, one entire specimen from Port Phillip Bay, Vict. (Area 25).

Amphiura phrixa Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 232, not figured.

PARATYPE: H132, one broken dry specimen (holotype in MCZ).

LOCALITY: Broome, W. Aust., in mud S. of the jetty, collected June 1932.

Genus **Ophiacantha** Mueller & Troschel, 1842

Ophiacantha alternata Clark, 1966

Mem. nat. Mus. Vict. 27: 328, text fig. 4.

HOLOTYPE: H15, in spirit.

PARATYPE: H16, one specimen in spirit.

LOCALITY: Port Phillip Bay near Port Phillip Heads (Area 58—sample sites 150-4).

Genus **Ophiactis** Luetken, 1856

Ophiactis fuscolineata Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 266, not figured.

PARATYPE: H133, one dry specimen with arm ends slightly broken (holotype in MCZ).

LOCALITY: Broome, W. Aust., 5-8 fm, collected June 1932.

Class ECHINOIDEA

Genus **Echinus** Linnaeus, 1758

Echinus darnleyensis Tenison-Woods, 1878

Proc. Linn. Soc. N.S.W. 2: 165, not figured.
= *Nudechinus darnleyensis* (Tenison-Woods) after Mortensen (1943).

SYNTYPE: H134, one dry specimen, with spines, attached to a wooden tablet (Old Reg. 44430). Other syntypes in AM.

LOCALITY: Darnley Island, Torres Strait, Qd., collected Chevert Expedition.

NOTES: Donated by Tenison-Woods March 1880 and noted 'Type' on the museum label.

Genus **Eupatagus** Agassiz, 1847

Eupatagus dyscritus Clark, 1938

Mem. Mus. comp. Zool. Harv. 55: 436, pl. 28, figs. 10-11.
= *Lissospatangus dyscritus* (Clark) after Mortensen (1951).

HOLOTYPE: H135, broken test only (Old Reg. 68686).

LOCALITY: Unknown, but assumed to be Victoria, collected T. S. Hall on 19 May 1921.

Genus **Hemiaster** Desor, 1847

Hemiaster (Rhynobrissus) apicatus Tenison-Woods, 1879

Proc. Linn. Soc. N.S.W. 4. 283, pl. 13, figs. 1-5.
= *Rhinobrissus hemiasteroides* Agassiz after Mortensen (1951).

SYNTYPE: H136, one dry test (no spines) (Old Reg. 44397).

LOCALITY: Moreton Bay, Qd.

NOTES: Donated Tenison-Woods March 1880 and noted 'Type' on the museum label; also on the label is 'No others as perfect known to me'.

Genus **Phyllacanthus** Brandt, 1835

Phyllacanthus parvispina Tenison-Woods, 1879

Proc. Linn. Soc. N.S.W. 4: 286, pl. 14, figs. A-B.

SYNTYPE: H137, one complete dry specimen (Old Reg. 44419). Other syntypes in AM.

LOCALITY: E. Coast of Australia. Localities given in the description are Botany Bay, Port Jackson and along the E. coast as far as Moreton Bay.

NOTES: Donated Tenison-Woods March 1880 and noted 'Type' on the museum label.

Class HOLOTHUROIDEA

Genus **Cucumaria** Blainville, 1830

Cucumaria mutans Joshua, 1914

Proc. Roy. Soc. Vict. 27: 4, pl. 1, figs. 1a-d.
= *Cucumella mutans* (Joshua) after Hickman (1962).

SYNTYPES: H138, two entire specimens in spirit (Old Reg. 60636-6). H139, one large dissected specimen and two small entire specimens (Old Reg. 60637-8). H140, one slide of ossicles from one of the syntypes.

LOCALITY: Western Port Bay (H138), also Port Phillip Bay and Victorian coastline. H139 has no locality.

NOTES: H138 is noted 'Type' on the label and H139 has the note 'in MSS'.

Cucumaria striata Joshua & Creed, 1915

Trans. R. Soc. S. Aust. 39: 18, pl. 3, figs. 2a-d.

SYNTYPES: H141, one dissected specimen in spirit (Old Reg. 60675). H142, one slide of ossicles from one of the syntypes.

LOCALITY: Great Australian Bight, W. Aust., collected J. W. Howard, August 1888.

NOTES: Obtained on exchange from SAM 1919. The other syntype was returned to SAM, but a recent search failed to locate it.

Genus **Phyllophorus** Grube, 1840

Phyllophorus ventripes Joshua & Creed, 1915

Trans. R. Soc. S. Aust. 39: 19, pl. 2, fig. 1; pl. 3, fig. 5.
= *Lipotrapeza ventripes* (Joshua and Creed) after Clark 1966.

SYNTYPES: H143, three specimens (none dissected) in spirit (Old Reg. 60676-8).

LOCALITY: South Coast of South Australia.

NOTES: Obtained on exchange from SAM 1919. Other syntypes were returned to SAM, but a recent search failed to locate them.

Phyllophorus vestiens Joshua, 1914

Proc. Roy. Soc. Vict. 27: 5, pl. 1, figs. 2a-d.
= *Lipotrapeza vestiens* (Joshua) after Clark 1966.

HOLOTYPE: H144, dissected specimen in spirit with the label 'Type' tied to it (Old Reg. 60639).

PARATYPE: H145, one entire specimen in spirit (Old Reg. 60640).

LOCALITY: Label with the types records Torquay, Vict. The description gives: Port Phillip Bay, Westernport Bay and Victorian coastline.

NOTES: H146 is a slide of a large section of 'skin' and is labelled 'MSS' (Old Reg. 62782). From the register this appears to have been used in the description and should be included as a paratype. However, neither of the existing types have any skin missing.

Genus **Taeniogyrus** Semper, 1868

Taeniogyrus allani Joshua, 1912

Proc. Roy. Soc. Vict. 25: 79, pl. 3-4, figs. 1-11.
= *Trochodota allani* (Joshua) after Clark 1966.

SYNTYPES: H29, one dissected specimen in spirit (Old Reg. 60646). H30, sixteen specimens in spirit (Old Reg. 60673) (see notes below). H147, one slide of a piece of 'skin' (Old Reg. 62784).

LOCALITY: Port Phillip Bay, Vict., 5-10 fm in mud banks, collected November 1910. H29 and H30 both bear the locality Victoria. H147 bears the locality Altona Bay, November 1910.

NOTES: H30 must be considered questionable syntypes for, although they bear the label 'co-types', the old register indicates one specimen under 60673. Also the label is possibly not in Joshua's handwriting.

Genus **Thyone** Oken, 1815

Thyone nigra Joshua & Creed, 1915

Trans. R. Soc. S. Aust. 39: 20, pl. 3, figs. 3a-e, 4.

SCHIZOHOLOTYPE: H148, a slide of ossicles from the holotype (holotype in SAM).

LOCALITY: Between 33°-37°S. and 132°-140°E., S. Aust., collected Verco.

Thyone vercoi Joshua & Creed, 1915

Trans. R. Soc. S. Aust. 39: 19, pl. 2, figs. 2-4; pl. 3, figs. 1a-g; pl. 4.
= *Staurothyone vercoi* (Joshua and Creed) after Clark 1966.

SCHIZOHOLOTYPE: H149, one slide of ossicles from the holotype (holotype in SAM).

LOCALITY: Between 33°-37°E. and 132°-140°E., S. Aust., collected Verco.

Genus **Trachythyone** Studer, 1876

Trachythyone macphersonae Pawson, 1962

Trans. R. Soc. N.Z. 2: 47, pl. 1, figs. 1-5.

HOLOTYPE: H1, in spirit.

LOCALITY: Garden Cove, Macquarie Island, at low tide level among sea anemones, collected J. H. Macpherson on 12 Dec. 1959.

Genus **Trochodota** Ludwig, 1891

Trochodota roebucki Joshua, 1914

Proc. Roy. Soc. Vict. 27: 9, pl. 1, figs. 4a-c.

HOLOTYPE: H34, dissected specimen in spirit, with the label 'Type' tied to it.

PARATYPES: H35, two small entire specimens in spirit.

LOCALITY: Torquay, Vict.

NOTES: H150, one slide of 'skin with tentacles' labelled 'MSS' Torquay, 23 Mar. 1913 (Old Reg. 62783). However, this could not have come from any of the type specimens described above.

References

CLARK, A. M., 1966. Port Phillip Survey 1957-1963. Echinodermata. *Mem. nat. Mus. Vict.* 27: 289-355.

CLARK, H. L., 1938. Echinoderms from Australia, an account of collections made in 1929 and 1932. *Mem. Mus. comp. Zool. Harv.* 55: 1-596.

HICKMAN, V. V., 1962. Tasmanian sea-cucumbers (Holothuroidea). *Pap. Proc. R. Soc. Tasm.* 96: 49-72.

JOSHUA, E. C., 1912. On a new holothurian of the genus *Taeniogyrus* found in Port Phillip Bay. *Proc. Roy. Soc. Vict.* 25: 79-81.

————, 1914. Victorian Holothuroidea, with descriptions of new species. *Proc. Roy. Soc. Vict.* 27: 1-11.

————, and CREED, E., 1915. South Australian Holothuroidea, with descriptions of new species. *Trans. R. Soc. S. Aust.* 39: 16-24.

MORTENSEN, T., 1943. A monograph of the Echinoidea. 3 (2): 1-553.

————, 1951. A monograph of the Echinoidea. 5 (2): 1-593.

PAWSON, D. L., 1962. A new sea-cucumber from Macquarie Island. *Trans. R. Soc. N.Z.* 2: 47-48.

TENISON-WOODS, J. E., 1878. The Echini of Australia (including those of the Chevert Expedition). *Proc. Linn. Soc. N.S.W.* 2: 145-176.

————, 1879. On some new Australian Echini. *Proc. Linn. Soc. N.S.W.* 4: 282-291.

CATALOGUE OF TRICLAD (PLATYHELMINTHES) TYPES IN THE NATIONAL MUSEUM OF VICTORIA, AUSTRALIA

By Brian J. Smith
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and Leonie Convey
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Abstract

Spencer and Dendy described 39 new species and sub-species of land planarians, types of 22 species and sub-species of which are listed, the remaining 17 being presumed lost. Paratypes of one species described by Steel are included and also the types of one species of marine triclad.

Introduction

Between 1889 and 1894 Dr Arthur Dendy of Melbourne University described 29 new species and subspecies of land planarians in nine papers and Professor W. Baldwin Spencer described 10 new species in two papers. Dendy donated some of his specimens to the National Museum in 1891 and Spencer donated some planarian material in 1916, but most of the planarian collections of these two workers remained in the Zoology Department of the University of Melbourne, unrecognized as to their importance. This material was donated to the Museum in May 1968. Of the 39 new species and subspecies proposed by these two workers, type material of only 22 species can be located and after searches at Melbourne University, the National Museum of Victoria, the Australian Museum, the Queensland Museum, the Tasmanian Museum and the South Australian Museum failed to reveal any of these missing types, they are presumed lost. Although one or two of the specimens were labelled 'figured specimen' or 'one of the types', the vast majority of the specimens here recognized as syntypes are done so by inference only. Because no other check could be given, no lectotypes have been selected. Included in the catalogue are paratypes of a species described by Steel which were designated as such in the Spencer donation in 1916. Included also is the type series of one marine triclad species in the collections.

The original generic names are used, arranged alphabetically, and under each genus the specific names are so arranged. With the specimens acquired from the Melbourne University Zoology Department in May 1968, the MUZD catalogue number is given. Details are also given of specimens other than types which were identified by the original authors in their own handwriting. The marine species is placed at the end of the catalogue as it is in a different suborder. The abbreviations for States are as follows: Vict. = Victoria, Tasm. = Tasmania, Qd. = Queensland, N.S.W. = New South Wales, S. Aust. = South Australia.

Suborder Terricola (Hyman, 1951)

Genus **Cotyloplana** Spencer, 1892

Cotyloplana punctata Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 45, pl. 5, figs. 5-8.

Syntype: G1452, one entire specimen. Length in spirit 42 mm.

Locality: Lord Howe Island, collected T. Whitelegge, 1887.

Notes: From MUZD (no number) and labelled 'Figured Specimen'.

Cotyloplana whiteleggei Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 44, pl. 5, figs. 1-4.

SYNTYPES: G1452, one entire specimen. Length in spirit 24 mm. G1453, one broken specimen.

LOCALITY: Lord Howe Island, collected T. Whitelegge, 1887.

NOTES: From MUZD (no number) and both jars labelled 'Figured Specimen'.

Genus **Geoplana** Mueller, 1857

Geoplana adae Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 73, fig. 7.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Macedon and Warburton, Vict.

OTHER SPECIMENS: G624, two specimens from Ferntree Gully, Vict., donated by Dendy on 27 April 1891 (Old Reg. No. 55155). G622, one specimen from Macedon, Vict., collected Spencer, June 1891. G1454, two specimens from Narrewarren, Vict. (MUZD 548). G1455, one specimen from Ferntree Gully (MUZD 564).

Geoplana adae var. **extralineata** Dendy, 1892

Proc. Roy. Soc. Vict. 4: 38, not figured.

SYNTYPE: G1456, one entire specimen. Length in spirit 9 mm.

LOCALITY: Narrewarren, Vict., collected Spencer and French, July 1891.

NOTES: MUZD 563.

Geoplana adae var. **fusca** Dendy, 1894

Proc. Roy. Soc. Vict. 6: 182, not figured.

SYNTYPE: G1457, one entire specimen. Length in spirit 18 mm.

LOCALITY: S. end Lake St. Clair, Tasm., collected Spencer, January 1893.

NOTES: From MUZD, no number.

Geoplana alba Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 75, figs. 10-11.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: McMahon's Creek, Warragul, Macedon, Croajingolong, Vict.

Geoplana alba var. **roseolineata** Dendy, 1892

Proc. Roy. Soc. Vict. 4: 36, not figured.

SYNTYPE: G1458, one entire specimen. Length in spirit 15 mm.

LOCALITY: Loch, Vict., collected Spencer, July 1891. The description states 'between Korumburra and Loch'.

NOTES: MUZD 549.

OTHER SPECIMENS: G632, two specimens from Narracan, Vict., collected W. Kershaw, September 1891.

Geoplana dendyi Spencer, 1891

Proc. Roy. Soc. Vict. 3: 86, figs. 1-5.

SYNTYPE: G1459, one entire specimen. Length in spirit 61 mm.

LOCALITY: Woods Point Road or Tanjil Track (description states 'Ridge between the valleys of the Yarra and Thompson Rivers'), Vict., collected Spencer, Nov. 1890.

NOTES: MUZD 547.

Geoplana dianensis Dendy, 1894

Rep. Australas. Ass. Advmt. Sci. 5: 421, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Tasmania.

NOTES: Description not valid.

Geoplana diemenensis Dendy, 1894

Proc. Roy. Soc. Vict. 6: 179, not figured.

SYNTYPE: G1460, one entire specimen. Length in spirit 43 mm.

LOCALITY: Mount Wellington, Tasm., collected L. J. Balfour, 14 Mar. 1892. Other localities in the description are: Near Newtown Falls collected A. Morton, N. Coast of Tasmania collected G. W. Officer, Emu Bay and Parattah both recorded by Spencer.

NOTES: From MUZD, no number.

Geoplana dubia Dendy, 1892

Proc. Roy. Soc. Vict. 4: 36, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Narrewarren, Vict., collected Spencer and French, July 1891.

Geoplana fletcheri Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 78, figs. 8-9.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Macedon, Vict.

OTHER SPECIMENS: G1461, one specimen from Macedon collected September 1891, MUZD 544.

Geoplana fletcheri var. **adelaidensis** Dendy, 1893

Rep. Australas. Ass. Advmt. Sci. 4: 373, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Norton's Summit near Adelaide, S. Aust., collected T. Steel, November, 1891.

OTHER SPECIMENS: G1462, ten specimens from Adelaide, S. Aust., collected T. Steel, May 1892, from MUZD, no number.

Geoplana frosti Spencer, 1891

Proc. Roy. Soc. Vict. 3: 87, figs. 6-9.

SYNTYPE: G1463, one entire specimen. Length in spirit 18 mm.

LOCALITY: Tanjil Track, Vict., collected Spencer, November 1890.

NOTES: Label with the specimen states 'green variety (one of types)'. MUZD 557.

Geoplana m'mahoni Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 74, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: McMahon's Creek on the Upper Yarra River, Vict.

OTHER SPECIMENS: G1468, one entire specimen from Narrewarren, Vict. MUZD 560.

Geoplana mortoni Dendy, 1894

Rep. Australas. Ass. Advmt. Sci. 5: 421 (description not valid).
Proc. Roy. Soc. Vict. 6: 181, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Tasm., collected A. Morton and Parattah, Tasm., collected Spencer.

Geoplana quadrangulata Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 77, figs. 6-6a.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Macedon, Vict.

OTHER SPECIMENS: G1469, one entire specimen from Macedon collected Sept. 1891, MUZD 545.

Geoplana quadrangulata var. **wellingtoni** Dendy, 1892

Trans. Roy. Soc. Vict. 2 (2): 35, not figured.

SYNTYPE: G1470, one entire specimen. Length in spirit 14 mm.

LOCALITY: Near Mount Wellington, Vict., collected December 1890.

NOTES: MUZD 558.

Geoplana regina Dendy, 1892

Proc. Roy. Soc. Vict. 4: 126, pl. 11, figs. 1, 1a-b.

SYNTYPE: G1471, one entire specimen. Length in spirit 40 mm.

LOCALITY: Gympie, Mary River, Qd., collected Spencer, September 1891.

NOTES: MUZD 553.

Geoplana spenceri Dendy, 1889

Trans. Roy. Soc. Vict. 1 (2): 50, pls. 7-10, figs. 1-49.

SYNTYPES: G1472, one slide of tranverse sections (part of a series); G1473, two slides of longitudinal sections (part of a series); G1474, one slide of sections (part of a series); G1475, one slide of sections from anterior part (part of a series).

LOCALITY: McMahon's Creek, Upper Yarra, and Warburton, Vict., collected Spencer and Dendy 1888.

Geoplana sugdeni Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 76, figs. 12-14.

SYNTYPE: G684, one entire specimen. Length in spirit 37 mm (Old Reg. 55156).

NOTES: Donated Dendy, 27 April 1891.

LOCALITY: Macedon, Vict.

OTHER SPECIMENS: G1476, one specimen from Narrewarren collected July 1891, MUZD 566.

Geoplana graminicola Steel, 1901

Proc. Linn. Soc. N.S.W. 25: 566, pl. 34, fig. 9.

PARATYPES: G612, five entire specimens and two fragments (Holotype in the Aust. Mus.).

LOCALITY: Petersham, N.S.W.

NOTES: From Spencer Collection labelled 'co-type'. This must be treated with some doubt as the type status is not shown on the original Steel label.

Geoplana hoggii Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 75, figs. 4-5.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Macedon, Vict.

OTHER SPECIMENS: G636, eleven entire specimens from Macedon, Vict., collected June 1891, in the Spencer Coll. G644, one entire and one broken specimen from Croydon, Vict., donated Dendy, April 1891 (Old Reg. 55154). G1464, two entire specimens from Narrewarren, Vict. After the name the label states '(? = *sulphurea*)', MUZD 565.

Geoplana howitti Dendy, 1891

Vict. Nat. 8: 43, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Upper Wellington, Vict.

Geoplana howittii var. **obsoleta** Dendy, 1892

Proc. Roy. Soc. Vict. 4: 37, not figured.

SYNTYPE: G1465, one entire specimen. Length in spirit 23 mm.

LOCALITY: Narrewarren, Vict., collected Spencer and French, July 1891.

NOTES: MUZD 559. This specimen is considered questionably a type because there is no information as to date or name of collector with the specimen.

Geoplana lucasi Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 74, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Croajingolong, Vict., 4,000 ft, collected Spencer.

Geoplana mediolineata Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 76, figs. 1-3, 3a.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Macedon, Warburton, Walhalla, Vict.

OTHER SPECIMENS: G653, one entire specimen from Ferntree Gully donated Dendy, 27 April 1891 (Old Reg. 55169). G1466, two specimens from Narrewarren, MUZD 561.

Geoplana minor Dendy, 1892

Proc. Roy. Soc. Vict. 4: 125, not figured.

SYNTYPE: G1467, one entire specimen. Length in spirit 9 mm.

LOCALITY: Burnett River, Cooran, Qd., collected Spencer, October 1891.

NOTES: MUZD 543.

Geoplana typhlops Dendy, 1894

Rep. Australas. Ass. Advmt. Sci. 5: 421 (description not valid).
Proc. Roy. Soc. Vict. 6: 184, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Mount Wellington, Tasm., collected Mrs Dendy and L. J. Balfour, March 1892; Hobart collected A. Morton, and Parattah collected Spencer.

Geoplana ventrolineata Dendy, 1892

Proc. Roy. Soc. Vict. 4: 35, not figured.

SYNTYPES: G1477, two entire specimens. Lengths in spirit 9 mm and 14 mm.

LOCALITY: Brunning's Nursery Garden, St. Kilda, Vict., collected Grayson, July 1891.

NOTES: MUZD 556.

Geoplana ventropunctata Dendy, 1892

Trans. Roy. Soc. Vict. 2 (2): 35, pl. 4, figs. 2-2a.

SYNTYPES: G1478, two entire specimens. Lengths in spirit 18 mm and 16 mm.

LOCALITY: Near Sassafras Gully, Narin, Vict., collected on a Field Naturalists' Club excursion 1891. The description states Ferntree Gully as the locality.

NOTES: From MUZD, no number.

OTHER SPECIMENS: G1489, one specimen from Narrewarren, MUZD 550.

Geoplana walhallae Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 78, not figured.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Walhalla, Vict., collected Dendy.

Genus **Rhynchodemus** Leidy, 1851

Rhynchodemus dubius Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 48, pl. 6, figs. 24-25.

SYNTYPES: G1479, five entire specimens. Lengths in spirit 82 mm (coiled), 45 mm, 37 mm, 15 mm and 12 mm.

LOCALITY: Lord Howe Island, collected T. Whitelegge 1887.

NOTES: On the label 'No. 5', 'a. 2'. From MUZD, no number.

Rhynchodemus fasciatus Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 46, pl. 5, figs. 9-10.

SYNTYPES: G1480, two entire specimens. Lengths in spirit 34 mm and 32 mm.

LOCALITY: Lord Howe Island, collected T. Whitelegge 1887.

NOTES: From MUZD, no number.

Rhynchodemus fletcheri Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 49, pl. 6, figs. 26-27.

TYPE SPECIMENS: Not present, presumed lost.

LOCALITY: Lord Howe Island, collected T. Whitelegge 1887.

Rhynchodemus grandis Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 47, pl. 2, figs. 14-19.

SYNTYPE: G1481, one entire specimen. Length in spirit 80 mm by 17 mm wide.

LOCALITY: Lord Howe Island, collected T. Whitelegge 1887.

NOTES: The label states 'Figured'. From MUZD, no number.

Rhynchodemus laterolineatus Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 46, pl. 5, figs. 11-13.

SYNTYPES: G1482, two entire specimens. Lengths in spirit 15 mm and 24 mm.

LOCALITY: Lord Howe Island, collected T. Whitelegge 1887.

NOTES: From MUZD, no number.

Rhynchodemus mediolineatus Spencer, 1892

Trans. Roy. Soc. Vict. 2 (2): 48, pl. 6, figs. 20-23.

SYNTYPE: G1483, one entire specimen. Length in spirit 23 mm.

LOCALITY: Lord Howe Island, collected T. Whitelegge 1887.

NOTES: From MUZD, no number.

Rhynchodemus simulans Dendy, 1892

Proc. Roy. Soc. Vict. 4: 38, not figured.

SYNTYPE: G1484, one entire specimen. Length in spirit 5 mm.

LOCALITY: Myrniong near Bacchus Marsh, Vict., collected C. C. Brittlebank, July 1891.

NOTES: MUZD 551.

Rhynchodemus victoriae Dendy, 1891

Trans. Roy. Soc. Vict. 2 (1): 79, figs. 15-15a.

TYPE SPECIMEN: Not present, presumed lost.

LOCALITY: Croajingolong, Vict., collected Spencer.

Suborder MARICOLA or RETROBURSALIA (Hyman, 1951)

Genus **Palombiella** Westblad, 1951

Palombiella macquari Nurse, 1964

Mem. nat. Mus. Vict. 26: 160, figs. 5-11.

HOLOTYPE: G1220, serial sections on two microscope slides.

PARATYPES: G1221, eleven entire specimens and five fragments in 5% formalin; G1485, serial sections of one specimen on four slides; G1486, serial sections of one specimen on nine slides; G1487, serial sections of one specimen on five slides; G1488, serial sections of one specimen on nine slides, all formerly registered G1221.

LOCALITY: G1220, Aerial Cove, Macquarie Island, under rocks in shallow water, collected N. M. Hayson, 26 Jan. 1950. ANARE MI/49/T3. G1221, Garden Cove, Macquarie Island, in rock pools, collected R. Kenny, 28 Dec. 1948.

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References

DENDY, A., 1889. The Anatomy of an Australian land planarian. *Trans. Roy. Soc. Vict.* 1: 50-94.

————, 1891. On the Victorian land planarians. *Trans. Roy. Soc. Vict.* 2: 65-80.

————, 1891. Notes on the planarian worms obtained on the Upper Wellington. *Vict. Nat.* 8: 43-44.

————, 1892. Additional observations on the Victorian land planarians. *Trans. Roy. Soc. Vict.* 2: 25-41.

————, 1892. Short descriptions of new land planarians. *Proc. Roy. Soc. Vict.* 4: 35-38.

————, 1892. Descriptions of some land planarians from Queensland. *Proc. Roy. Soc. Vict.* 4: 123-129.

————, 1893. Notes on some land planarians from Tasmania and South Australia. *Rep. Australas. Ass. Advmt. Sci.* 4: 369-374.

————, 1894. Notes on some new or little-known land planarians from Tasmania and South Australia. *Proc. Roy. Soc. Vict.* 6: 178-188.

————, 1894. Further notes on land planarians of Tasmania and South Australia. *Rep. Australas. Ass. Advmt. Sci.* 5: 420-423.

NURSE, F. R., 1964. Marine Tricladidae from Macquarie Island. *Mem. nat. Mus. Vict.* 26: 157-166.

SPENCER, W. B., 1891. Notes on some Victorian land planarians. *Proc. Roy. Soc. Vict.* 3: 84-93.

————, 1892. Land planarians from Lord Howe Island. *Trans. Roy. Soc. Vict.* 2: 42-51.

STEEL, T., 1901. Australian land planarians: Descriptions of new species and notes on collecting and preserving. *Proc. Linn. Soc. N.S.W.* 25: 563-580.

CATALOGUE OF MAMMAL TYPES (CLASS MAMMALIA) IN THE NATIONAL MUSEUM OF VICTORIA

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Abstract

Types of 25 mammal species and sub-species are presented in the catalogue. They comprise marsupials, a cetacean, a choripteran and rodents. Description of these types has been spread over more than a century, 1866-1967.

Introduction

The mammal collections in the National Museum of Victoria have been built up from 1854, and include the types of many native Australian species. Professor Frederick McCoy, the first Director of the Museum, contributed to this field of endeavour, and one of his species, *Gymnobelideus leadbeateri,* is known only from Victoria. Following McCoy's death in 1899, Professor W. Baldwin Spencer, Professor of Biology at the University of Melbourne, was appointed Honorary Director of the Museum, and soon afterwards the National Museum collections were moved from their original location at the University to the Public Library buildings. Included in these collections were the types of a number of marsupials described by Spencer from material collected when he was zoologist on the Horn Expedition to Central Australia, from May to August 1894. Specimens from Central Australia were also procured by Spencer and for some of them he erected further species.

A collection of rodents obtained during and shortly after the return of the Horn Expedition was sent by Spencer to E. R. Waite, zoologist at the Australian Museum, Sydney. Waite named several new species in this collection and according to the Australian Museum mammal register he retained the type (= holotype) of each and returned the balance of the specimens to Spencer. On a number of widely separated occasions after Spencer became Museum Director, portions of his Central Australian collections were transferred to the Museum from the Zoology Department of the University of Melbourne. Due to this transfer of specimens to the National Museum in several stages, and the distribution of part of Spencer's collections to various other institutions, considerable confusion has arisen in the literature concerning the location of types of several of his Australian mammal species.

The Spencer mammal collection is a valuable one of both historical and scientific significance. However, the passage of time has resulted in considerable difficulty in identification of much of the type material. Some specimens have vanished, possibly destroyed, while others have lost most of their data. Much of the catalogue relies on information preserved in archival records, coupled with detailed examination of existing material and type descriptions. Subsequent National Museum research workers have also erected new species.

In the preparation of this catalogue, the museum register of the Zoology Department of the University of Melbourne has been of considerable value, enabling the recognition of specimens transferred from there to this Museum. Condition of specimens is generally not listed. Old spirit specimens as a rule exhibit some slipping of the skin, but this does not prevent ready identification. Unless otherwise indicated, spirit specimens mentioned in the catalogue have not had the skulls extracted.

The following abbreviations have been used: AMNH = American Museum of Natural History; Aust. Mus. = Australian Museum, Sydney; BM = British Museum (Natural History); F & W = Fisheries and Wildlife Department, Melbourne; MCZ = Museum of Comparative Zoology, Harvard; MUZD = Museum of the Zoology Department, University of Melbourne; NMV = National Museum of Victoria; QVM = Queen Victoria Museum, Launceston; Zool. & Accl. Soc. = Zoological and Acclimatization Society of Victoria. Australian States and territories are abbreviated as: N.T. = Northern Territory, N.S.W. = New South Wales, Q'd. = Queensland, S.A. = South Australia, Tasm. = Tasmania, Vict. = Victoria, W.A. = Western Australia.

Class MAMMALIA

Order MARSUPIALIA

Family DASYURIDAE

Genus **Dasyuroides** Spencer, 1896

Dasyuroides byrnei Spencer, 1896

Rept. Horn Sci. Exped. Centr. Austr., Zool. 2: 36-40, pl. 3, figs. 1, 1a, 1b; pl. 4, figs. 1-4.

LECTOTYPE: C6323, male in spirit, Charlotte Waters, N.T., Feb. 1895, presented W. B. Spencer 18 Dec. 1895, specimen 'a' of description (old nos. R12318, 56417).

PARALECTOTYPES: C459, male in spirit, Charlotte Waters, N.T., Mar. 1895, specimen 'c' of description; C460, female in spirit, Charlotte Waters, N.T., April 1895, specimen 'b' of description; C4816, male in spirit, skull missing, Charlotte Waters, N.T., May 1895, may be specimen 'g' of description (old no. R12427); C6157, male, skull only, Central Australia, quoted in description and figured, may be skull of C4816 and also specimen 'g' (old nos. R4630, MUZD No. 934). Specimen 'e', formerly housed at the MUZD has not been located.

NOTES: A preliminary description of this species was read to the Royal Society of Victoria, June 1895, but not published until April 1896 (*Proc. Roy. Soc. Vict.* 8: 6-8). In the interim, a more detailed description was published in the Horn Report (Feb. 1896). No holotype was designated, but seven syntypes were listed. It appears that Spencer intended C6323, labelled type, to be the holotype, so it is erected as lectotype. Tate (1947) comments 'Types probably in Sydney Museum (*byrnei* from Charlotte Waters)'. There are two 'Spencer' specimens in the Aust. Mus. from Charlotte Waters, Reg. Nos. male M1140 and female M1141.

Genus **Phascogale** Temminck, 1824

Phascologale macdonnellensis Spencer, 1895

Proc. Roy. Soc. Vict. 7: 222-223.
= *Antechinus macdonnellensis* (Spencer).

SYNTYPE: C7804, female in spirit, Alice Springs, N.T., collected Mounted Trooper South, Horn Expedition, May-Aug. 1894 (old no. 56415 or 56416).

NOTES: NMV mammal register indicates that there were two specimens, male and female. Spencer mentioned female only, and his label 'type' is attached to this specimen.

Genus **Sminthopsis** Thomas, 1887

Sminthopsis larapinta Spencer, 1896

Rept. Horn Sci. Exped. Centr. Austr., Zool. 2: 33-35, pl. 2, figs. 2, 2a, 2b.

LECTOTYPE: C6207, adult male in spirit from Charlotte Waters, N.T., collected P. M. Byrne, donated W. B. Spencer, 7 Jan. 1896. Specimen 'a' of description

(old nos. R12317, 56441). There should be two paralectotypes, but these have not been located.

NOTES: This species was intended to be named from a single specimen in *Proc. Roy. Soc. Vict.* 8: 8-9 which was issued April 1896. However, due to delay in publication the Horn Report with its fuller description took priority. It is possible that Spencer intended C6207 to be the holotype because he labelled it 'type', and it has therefore been erected as lectotype.

Sminthopsis longicaudatus Spencer, 1909

Proc. Roy. Soc. Vict. 21: 449-451.

HOLOTYPE: C7803, adult male in spirit (skull extracted), W.A., donated G. A. Keartland (old no. R4648).

NOTES: Troughton (1965) comments that L. Glauert, when Curator of the Perth Museum, concluded that Keartland had obtained this specimen in the Pillendinnie (Marble Bar) region of W.A.

Sminthopsis murina constricta Spencer, 1896

Rept. Horn Sci. Exped. Centr. Austr., Zool. 2: 33.
= *Sminthopsis macrura constricta* (Spencer) following Tate 1947.

? HOLOTYPE: C6920, young male, Oodnadatta, N.T., Horn Expedition, May-Aug. 1894 (old no. R12514).

NOTES: As far as can be determined no record of this taxon exists apart from the above specimen. Unfortunately the NMV specimen does not correspond in sex or measurements to the one used in the description.

Sminthopsis psammophilus Spencer, 1895

Proc. Roy. Soc. Vict. 7: 223-224.

HOLOTYPE: C6203, male in spirit, plus skull, collected near Lake Amadeus, N.T., during Horn Expedition, May-Aug. 1894 (old no. R12314).

Family MACROPODIDAE

Genus **Bettongia** Gray, 1837

Bettongia tropica Wakefield, 1967

Vict. Nat. 84: 15-21, pl. 3.

HOLOTYPE: C6870, adult male, skin and skull, Mount Spurgeon, 3,700′, NE. Q'd., collected P. J. Darlington, 24 July 1932.

NOTES: There are two paratypes in MCZ (Nos. 29205, 29206); two in the AMNH (Nos. 65279, 65280); and a sixth specimen in the Zoological Museum of the Oslo University, Norway.

Genus **Halmaturus** Illiger, 1811

Halmaturus wilcoxi McCoy, 1866

Ann. Mag. Nat. Hist. (3) 18: 322-323.
= *Thylogale stigmatica wilcoxi* (McCoy).

LECTOTYPE: C7083, female, skin, skull in skin, Richmond R., N.S.W., collected J. F. Wilcox (old nos. R122, 18939).

PARALECTOTYPE: C7084, male, data as for lectotype (old nos. R2028, 18940).

NOTES: In the description McCoy listed Richmond R., N.S.W., as type locality. Labels attached to type specimens and entries in registers indicated Clarence River,

N.S.W., however, reference to archival correspondence between McCoy and Wilcox, Jan.-July 1866, in the NMV has established the Richmond R. as the correct locality.

Thomas (1888) mentions that there were 'stuffed specimens', male and female, and skeletons of Richmond R. specimens. Skeletons have not been located.

Family PERAMELIDAE

Genus **Peragale** Thomas, 1887

Peragale minor Spencer, 1897

Proc. Roy. Soc. Vict. 9: 6-9, pl. 2, figs. 1-4.
= *Macrotis minor* (Spencer).

HOLOTYPE: C7091, adult male in spirit, skull missing, specimen 'e', Sept. 1895 (old no. R12430); C7294, adult male, skull figured, probably from C7091 (old nos. R4629, MUZD No. 1034). From sand-hills about forty miles NE. Charlotte Waters, N.T., collected P. M. Byrne.

PARATYPES: C7086, adult female in spirit, specimen 'a' (old no. R12604); C7090, adult female in spirit, plus skull, specimen 'b', 16 Sept. 1895 (old no. R12429); C7295, adult female in spirit, specimen 'd' of description (old nos. R12313, 56926). Localities as for holotype. Condition of spirit specimens poor.

NOTES: Four of the five specimens of the type series are accounted for. In the NMV collections are two pouch young C7088, C7089 which may belong to C7086. Although specimens of this series were presented to the Museum on different dates, it has been deduced from examination that all were collected around Sept. 1895. Designation of the holotype follows Troughton (1932).

Perameles eremiana Spencer, 1897

Proc. Roy. Soc. Vict. 9: 9-11, pl. 2, figs. 5-7.

HOLOTYPE: C5864, adult male in spirit from sand-hills about forty miles NE. Charlotte Waters, N.T. (old nos. R12312, 56928).

PARATYPE: C213, skull, labelled Charlotte Waters (MUZD No. 1031), corresponds in dimensions to female skull of description and may belong to spirit specimen C488 without head, a female with four enlarged nipples. Pouch young C5862 and C5863 labelled Central Australia may also belong to C488.

NOTES: In description of this taxon, Spencer cites localities for types as Charlotte Waters area and Burt Plain N. of Alice Springs. Specimens for this description were received from F. J. Gillen of Alice Springs and from P. M. Byrne of Charlotte Waters. It is not possible to accurately nominate the Burt Plain specimen.

Family PHALANGERIDAE

Genus **Cercartetus** Gloger, 1841

Cercartetus concinnus minor Wakefield, 1963

Vict. Nat. 80: 100-101.

HOLOTYPE: C7802, male, skin and skull, Nurcoung, 10 m NW. of Natimuk, Vict., collected F. Saunders, Sept. 1962 (F & W 328).

Genus **Gymnobelideus** McCoy, 1867

Gymnobelideus leadbeateri McCoy, 1867

Ann. Mag. Nat. Hist. (3) 20: 287-288, pl. 6, figs. 1-5.

LECTOTYPE: C4380, male, skin and skull, Bass R., Vict., registered in NMV, July 1867 (old nos. R12367, 21617).

PARALECTOTYPE: C4379, male, skin with skull in skin, Bass R., Vict., registered in NMV, July 1867 (old nos. R12366, 21616).

NOTES: C4380 is erected as lectotype because, as far as can be determined, it was the only skull available at the time; it was figured in the description and dimensions given. Brazenor (1932) corrects McCoy's statement that both sexes were present in the original series.

Family VOMBATIDAE

Genus **Phascolomys** Duméril, 1806

Phascolomys tasmaniensis Spencer & Kershaw, 1910

Mem. nat. Mus. Vict. 3: 52-58, pl. 9, figs. 2, 4, 6, 7; pl. 11, figs. 2, 5, 7, 8, 10, 14. Tables 4, 6, 7, 10.
= *Vombatus ursinus* (Spencer and Kershaw).

HOLOTYPE: C2057, male, skin (mounted), skull and skeleton, Tasmania, presented Zool. & Accl. Soc., 19 Dec. 1864 (may be date of registration), No. 3 of table 4, pl. 9, fig. 4 (old no. 15122).

PARATYPES: C6664, juvenile female, skin and skull, Tasm., presented Zool. & Accl. Soc., 5 Jan. 1901. Table 4, no. 10 (old nos. R370-1); C6666, male, skin, skull and skeleton, Tasm., presented Zool & Accl. Soc., 6 Sept. 1907, pl. 9, fig. 6 (old nos. R2390-2); C6680, female, skull and skeleton, N. Tasm., ex QVM, Launceston, Tasm., 7 Aug. 1903, pl. 11, fig. 14 (old nos. R2345-6).

NOTES: Only the above three paratypes have been positively identified from the labels or plates accompanying the description. The following seven listed specimens are probably included in type series. All were received prior to the date of publication of this taxon, and represent the NMV collection of Tasmanian wombat material at that period: C6681, male, skull and skeleton, Tasm., purchased W. McGowan, Launceston, 5 Feb. 1909 (old nos. R2906-7); C6682, female, skull and skeleton, Tasm., purchased W. McGowan, 14 Oct. 1908 (old nos. R2859-60); C6683, male, skull and skeleton, presented Zool. & Accl. Soc., 14 June 1909 (old nos. R3018-9); C6684, male, skull and skeleton, Tasm., purchased W. McGowan, 13 June 1908 (old nos. R2656-7); C6685, female, skull and skeleton, Tasm., presented Zool. & Accl. Soc., 11 Oct. 1907 (old nos. R2457-8); C6686, female, skull and skeleton, Tasm., purchased W. McGowan, 13 June 1908 (old nos. R2658-9); C6687, female, skull end skeleton, Tasm. (old no. R2661).

Order CETACEA

Family BALAENOPTERIDAE

Genus **Physalus** Lacépède 1804

Physalus grayi McCoy, 1867

Rec. Intercol. Exhib. Austr. Melbourne IV.
= *Balaenoptera physalus* Linnaeus 1758.

HOLOTYPE: Skeleton from Jan Juc, Vict., 1867, formerly lodged at the University of Melbourne. Present whereabouts unknown, possibly destroyed.

Order CHIROPTERA

Family VESPERTILIONIDAE

Genus **Chalinolobus** Peters, 1866

Chalinolobus dwyeri Ryan, 1966

J. Mammal. 47: 89.

HOLOTYPE: C4021, male, spirit specimen (skull extracted), from mine tunnel, Copeton, 14 m S. of Inverell, N.S.W., collected P. D. Dwyer, 7 Feb. 1962.

PARATYPE: C4020, female, data as for holotype.

Order Rodentia

Family Muridae

Genus **Conilurus** Ogilby, 1838

Conilurus pedunculatus pedunculatus Waite, 1896

Rept. Horn Sci. Exped. Centr. Austr., Zool. 2: 395-398, pl. 25, figs. 1a-f.
= *Zyzomys (Laomys) pedunculatus* (Waite).

Syntype: C7806, male in spirit (old nos. R12316, 57122), labelled 'F, June 1895, Alice Springs, 3 instal.'

Notes: There is some confusion about location of the specimens in the type series of this taxon. C7806 cannot be F of the series as F has skull extracted and is var. *brachyotis*. Labels may have been mixed during previous examination of material. Tate (1951) says 'Co-types—Sydney, a skin with skull inside; BM No. 97.1.8.5, young female, body in alcohol, skull cleaned, from Alice Springs, Central Australia, collected by W. A. Horn . . . BM No. 97.1.8.4, adult male, in alcohol, which is probably another co-type'. In actual fact none of these specimens was collected by Horn. Waite (1896), p. 394, mentions that Spencer furnished him with the material. MUZD catalogue of biological specimens lists No. 1006 as a 'co-type' from Alice Springs, donated by W. B. Spencer and identified by Waite. There is no indication of the final destination of this specimen. The Aust. Mus. received two specimens from Spencer in 1896, M1064 skin with skull in skin, specimen A in paper, labelled 'type'; M1065 skin with skull in skin, specimen G in paper (var. *brachyotis*) labelled 'type'. In Nov. 1896 another specimen, M1158 from Central Australia (skin, skull in skin), was received from Horn, and in 1898, M1298 from Spencer from Alice Springs.

Genus **Leggadina** Thomas, 1910

Leggadina hermannsburgensis brazenori Troughton, 1937

Rec. Aust. Mus. 20: 187-188.

Holotype: C984 skin and skull specimen No. 1, collected from Junction of Murray and Darling Rivers on Blandowski Expedition of 1857.

Paratypes: C985-C1006. Collection data as above. Blandowski numbers are bracketed. C985 skin and skull, No. 2 (1399); C986 skin and skull; skin, skull in skin C987, C988 (825), C989 (1371), C990 (1934), C991, C992 (1835), C993 (827), C994 (790); C995 skin only; skin, skull in skin C996-C998; skin skull fragmented C999 (1333); skin, skull in skin C1000 (1332), C1001, C1002, C1003 (819), C1004, C1005 (848), C1006; mounted specimens 21677 (1093), 21678 (1661). Twenty-seven specimens are listed in the description but only the above 25 have been located. All except the holotype are in poor condition. There are parts of skins with Blandowski numbers 821, 1336 and 1376.

Notes: The holotype C984 was designated lectotype by Troughton. There are anomalies concerning the dimensions of the type. Measurements made by Brazenor (1936) and copied and quoted by Troughton (1937) do not fit C984 or C985. Those on the label of C984 were made by Hinton of the BM in 1936 and are H.B. 74; T.L. 71; H.F. 19·5; E. 16·5. The small discrepancy between Brazenor's and Hinton's measurements of C984 are attributed to individual differences in measuring techniques. It appears that labels on skulls of C984 and C985 were mixed during previous work and during current examination the liberty of righting them has been taken.

Genus **Mastacomys** Thomas, 1882

Mastacomys fuscus brazenori Ride, 1956

Proc. zool. Soc. Lond. 127: 436.

HOLOTYPE: C199, male, skin and skull, Olangolah near Beech Forest, at head of Gellibrand R., 1800′, Vict., collected C. W. Brazenor, 22 Oct. 1933. Skull badly fractured.

Genus **Mus** Linnaeus, 1758

Mus hermannsburgensis Waite, 1896

Rept. Horn Sci. Exped. Centr. Austr., Zool. 2: 405-406, pl. 26, figs. 5a-f.
= *Leggadina hermannsburgensis* (Waite).

? PARALECTOTYPES: C4879, female, skin, skull missing, Hermannsburg, N.T., Feb. 1895 (old no. R12339); C7807, male in spirit, Central Australia, donated W. B. Spencer (old nos. R12315, 57126); C7808, female in spirit, Hermannsburg, N.T., donated W. B. Spencer (old no. R12340).

NOTES: In the description of this taxon five specimens A, B, C, D, and E are listed, one male (A) and four females (B and C had the skulls extracted). The NMV specimens listed above do not disagree with this. Lectotype M1070A, one of the two original specimens of *Mus hermannsburgensis* in the Aust. Mus., sex not determinable (mounted specimens), was selected by Troughton 1932. Tate (1951) lists 'paratypes' BM Nos. 97.1.8.1-97.1.8.3, adult male and two females (in spirit) from Hermannsburg Mission, Central Australia, collected by W. A. Horn.

Genus **Notomys** Lesson, 1842

Notomys amplus Brazenor, 1936

Mem. nat. Mus. Vict. 9: 7-8, pl. 1, fig. 2.

HOLOTYPE: C512, female, skin and skull, Charlotte Waters, N.T., from P. M. Byrne, June 1896.

PARATYPE: C513, female in spirit. Locality and dates as for holotype.

NOTE: Tate (1951) says that the holotype C512 was collected by the Horn Expedition. It was in fact acquired after the return of that Expedition.

Notomys mitchellii alutacea Brazenor, 1934

Mem. nat. Mus. Vict. 8: 79-80, 88-9, pl. 5., fig. 4; pl. 6, figs. 3a-c; pl. 7.
= *Notomys mitchellii* (Gould).

HOLOTYPE: C38, female, skin and skull, Ooldea, S.A., collected J. A. Kershaw, July 1921.

PARATYPES: C39, skin and skull, W.A., donated W. Webb, 16 Feb. 1875; C40-42, data as for holotype. Only four of nine paratypes have been located. Central Australian material has not been sighted. Date of donation of C39 is given as 16 Feb. 1875 in museum register and as 1865 by Brazenor in his paper. Archival material indicates that 1875 is correct.

Genus **Podanomalus** Waite, 1898

Podanomalus aistoni Brazenor, 1934

Mem. nat. Mus. Vict. 8: 84-85, 88-89, pl. 6, figs. 5a-c, table.
= *Notomys cervinus* (Gould).

HOLOTYPE: C7818, male, skin and skull, Mulka, E. of Lake Eyre, S.A., collected G. Aiston, October 1932 (old no. R13740).

PARATYPES: C7809, male in spirit (old no. R13709); C7810, female in spirit

(old no. R13726); C7811, male in spirit (old no. 13729); C7812, male in spirit (old no. R13730); C7813, male in spirit, skull extracted (old no. R13732); C7814, male in spirit (old no. R13734); C7815, male in spirit (old no. R13735); C7816, female skin and skull (old no. R13727); C7817, labelled male (female in paper) skin and skull (old no. R13741); C7819, labelled male (female in paper) skin without skull (old no. R13712). Locality data as for holotype.

NOTES: R13731 was sent to the AMNH, 27 April 1937, and R13733 to the BM, 16 Oct. 1936. Brazenor mentions that he examined 15 specimens, but only 13 are listed. In the same paper, p. 82, he identifies R13734-5 (C7814-5) as *Notomys cervinus*.

Genus **Pseudomys** Gray, 1832

Pseudomys (Gyomys) fumeus Brazenor, 1934

Mem. nat. Mus. Vict. 8: 158-9, pl. 18, figs. a-c.

HOLOTYPE: C197, adult male, skin and skull, Turton's Pass, Otway Forest, Vict., collected C. W. Brazenor, 20 Oct. 1933.

PARATYPE: C198, adult male in spirit, same locality and collector, 29 Oct. 1933.

Genus **Rattus** Fischer, 1803

Rattus greyi ravus Brazenor, 1936

Mem. nat. Mus. Vict. 10: 69, pl. 13, fig. 3, preoccupied name, see under.

Rattus greyi peccatus Troughton, 1937

Rec. Aust. Mus. 20: 189, footnote (new name for *ravus* Brazenor).
= *Rattus fuscipes greyi* (Gray).

LECTOTYPE: C688, female, skin and skull, Portland, Vict., collected 12 June 1933, donated F. Wood-Jones.

PARALECTOTYPE: C759, male, skin, skull missing, Portland, Vict., collected C. W. Brazenor, 15 Aug. 1933. To this type series Brazenor's Portland rats, table, p. 68, should be added. However, these cannot be identified.

NOTES: Troughton (1937) notes that *Rattus greyi ravus* Brazenor was preoccupied by *Epimys (= Rattus) ravus* Robinson and Kloss (1916). Finlayson (1960) considers that the differences separating *Rattus assimilis* and *Rattus greyi* are more than subspecific. However, as a result of cross-breeding experiments, Horner and Taylor (1965) place *Rattus assimilis* and *Rattus greyi* as subspecies of *Rattus fuscipes*.

Rattus tunneyi dispar Brazenor, 1936

Mem. nat. Mus. Vict. 9: 5-7, pl. 1, figs. 1a, b.

HOLOTYPE: C4908, male, skin and skull., N.T., collected on Horn Expedition, May-Aug. 1894 (old no. R12642).

PARATYPES: C514, male in spirit; C515, male in spirit; C516, female in spirit, exchanged to the AMNH 1937; C517-23, females in spirit; C524, male, skin and skull. All from Alice Springs, N.T., donated W. B. Spencer, 23 March 1916. In his description Brazenor mentions that twelve specimens were examined from Alice Springs and unspecified areas of Central Australia. Only the Alice Springs paratypes can be accounted for.

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References

AITKEN, P. F., 1968. Observations on *Notomys fuscus* (Wood Jones) (Muridae-Pseudomyinae) with notes on a New Synonym. *S. Aust. Nat.* 43: 37-45.

BRAZENOR, C. W., 1932. A Re-examination of *Gymnobelideus leadbeateri* McCoy. *Aust. Zool.* 7: 106-109.

————, 1934. A Revision of the Australian Jerboa Mice. *Mem. nat. Mus. Vict.* 8: 74-89.

————, 1934. A new species of Mouse *Pseudomys (Gyomys)*, and a record of the broad-toothed rat, *Mastacomys*, from Victoria. *Mem. nat. Mus. Vict.* 8: 158-161.

————, 1936. Two new rats from Central Australia. *Mem. nat. Mus. Vict.* 9: 5-8.

————, 1936. An Extended Description of *Pseudomys novae-hollandiae*, with Remarks on its Affinity to *P. hermannsburgensis*. *Mem. nat. Mus. Vict.* 9: 9-14.

————, 1936. Muridae Recorded from Victoria. *Mem. nat. Mus. Vict.* 10: 62-85.

COCHRAN, D. M., 1961. Type specimens of reptiles and amphibians in the United States National Museum. *Bull. U.S. natn. Mus.* 220.

ELLERMAN, J. R., 1949. The Families and Genera of Living Rodents. Vol. III. Part 1, 1949. London.

FINLAYSON, H. H., 1941. On Central Australian Mammals. Part II. The Muridae. *Trans. R. Soc. S. Aust.* 65 (2): 215-232.

————, 1960. *Rattus greyi* and its derivatives. *Trans. R. Soc. S. Aust.* 83: 123-149.

HORNER, B. E., and TAYLOR, J. M., 1965. Systematic Relationships among *Rattus* in Southern Australia: Evidence from Cross-breeding Experiments. *C.S.I.R.O. Wildl. Res.* 10: 101-109.

IREDALE, T., and TROUGHTON, E. le G., 1934. A Check List of the Mammals Recorded from Australia. *Mem. Aust. Mus.* 6: 1-122.

MCCOY, F., 1866. On a new Species of *Halmaturus* from East Australia. *Ann. Mag. nat. Hist.* (3) 18: 322-323.

————, 1867. On the Recent Zoology and Palaeontology of Victoria. Intercol. Exhib. Essays 1866. Melbourne: 3-24.

————, 1867. On a new Genus of *Phalanger*. *Ann. Mag. nat. Hist.* (3) 20: 287-288.

————, 1885. Prodromus of the Zoology of Victoria. X. Melbourne 1885.

PESCOTT, R. T. M., 1954. Collections of a Century. Melbourne 1954.

RIDE, W. D. L., 1956. A new fossil *Mastacomys* (Muridae) and a Revision of the Genus. *Proc. zool. Soc. Lond.* 127: 431-439.

ROBINSON, H. C., and KLOSS, C. B., 1916. Preliminary Diagnoses of some New Species and Sub-species of Mammals and Birds Obtained in Korinchi, West Sumatra, Feb.-June 1914. *Journ. Straits Branch Roy. Asiatic Soc.* 73: 269-278.

RYAN, R. M., 1966. A new and some imperfectly known Australian *Chalinolobus* and the taxonomic status of African *Glauconycteris*. *J. Mammal.* 47: 86-91.

SIMPSON, G. G., 1945. The Principles of Classification and a Classification of Mammals. *Bull. Amer. Mus. nat. Hist.* 85. New York.

SPENCER, W. B., 1895. Preliminary Notice of two new species of Marsupials from Central Australia. *Proc. Roy. Soc. Vict.* 7: 222-224.

————, 1896. Report on the work of the Horn Scientific Expedition to Central Australia. Parts 1 and 2. London.

————, 1896. Preliminary Description of Certain New Marsupials from Central Australia together with Remarks on the Occurrence and Identity of *Phascologale cristicauda*. *Proc. Roy. Soc. Vict.* 8: 5-13.

————, 1897. Description of Two New Species of Marsupials from Central Australia. *Proc. Roy. Soc. Vict.* 9: 5-11.

————, 1909. Description of a New Species of *Sminthopsis*. *Proc. Roy. Soc. Vict.* 21: 449-451.

————, and KERSHAW, J. A., 1910. The Existing Species of the Genus *Phascolomys*. *Mem. nat. Mus. Vict.* 3: 37-63.

TATE, G. H. H., 1947. On the Anatomy and Classification of the Dasyuridae (Marsupialia). *Bull. Am. Mus. nat. Hist.* 88: 97-156.

————, 1948. Studies on the Anatomy and Phylogeny of the Macropodidae (Marsupialia). *Bull. Am. Mus. nat. Hist.* 91: 233-352.

————, 1951. The Rodents of Australia and New Guinea. *Bull. Am. Mus. nat. Hist.* 97: 183-430.

THOMAS, O., 1888. Catalogue of the Marsupialia and Monotremata in the collection of the British Museum (Natural History), London.

TROUGHTON, E. le G., 1932. On Five New Rats of the Genus *Pseudomys*. *Rec. Aust. Mus.* 18: 287-294.

———, 1932. A Revision of the Rabbit-Bandicoots. *Aust. Zool.* 7: 219-236.

———, 1937. The Status of *'Mus' novaehollandiae* Waterhouse and Allied Forms. *Rec. Aust. Mus.* 20: 185-190.

———, 1965. A Review of the Marsupial Genus *Sminthopsis* (Phascogalinae) and Diagnoses of New Forms. *Proc. Linn. Soc. N.S.W.* 89: 307-321.

WAITE, E. R., 1896. Report on the work of the Horn Scientific Expedition to Central Australia. Part 2. Zoology Muridae: 393-409.

———, 1898. Observations on Muridae from Central Australia. *Proc. Roy. Soc. Vict.* 10: 114-128.

WAKEFIELD, N. A., 1963. The Australian Pigmy-Possums. *Vict. Nat.* 80: 99-116.

———, 1967. Some taxonomic revision in the Australian Marsupial Genus *Bettongia* (Macropodidae) with description of a new species. *Vict. Nat.* 84: 8-22.

REPTILE AND AMPHIBIAN TYPE SPECIMENS HOUSED IN THE NATIONAL MUSEUM OF VICTORIA

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Introduction

This list is an attempt to locate or account for all Reptile and Amphibian type specimens which have been, or are believed to have been, lodged in the National Museum of Victoria. This task has been made difficult by several factors. Some authors rarely nominated type specimens, but rather listed specimens from particular localities. In such cases, any specimen of a given taxon which was in the Museum collections from these localities and available to the author/s is regarded as having been a syntype. Fortunately, in most instances one specimen has retained some original identification (e.g. 'figured specimen') which confirms that it was used to fix the taxon, and accordingly such specimen has been nominated as the lectotype.

Concerning material collected during the Horn Expedition of 1894, it is reasonable to assume that, as various States were represented, they each received representative collections. It is also reasonable to assume that, as Spencer was Zoologist with the Expedition, Victoria would have retained the bulk of the zoological material. Spencer's collection was housed jointly at the National Museum and the University of Melbourne (Zoology and Anatomy Departments). The remainder of the zoological specimens were probably lodged at Sydney and/or Adelaide Universities. Unfortunately some of Spencer's material from the University of Melbourne (most of which is now in the National Museum) has been lost, or become separated from its original labels, making it extremely difficult to determine types, figured specimens or specimens from given localities.

In an attempt to avoid systematic problems, each taxon is listed alphabetically under Family. Each Family has then been arranged alphabetically into its respective Suborder, Order, and Class. The general format follows Cochran 1961, each taxon being listed with its original reference. In each case the final name listed is that currently recognized for the taxon.

All specimens are in spirits, and are in at least fair condition unless otherwise stated.

Class Amphibia

Order Salientia

Family Hylidae

Genus **Hyla** Laurenti, 1768

Hyla ewingii iuxtaewingii Copland, 1957

Proc. Linn. Soc. N.S.W. 82: 60.
= *Hyla ewingii* D. & B. 1841.

Paratype: D6723, Darby, Wilson's Promontory, Vict., donated J. A. Kershaw.

Hyla ewingii loveridgei Copland, 1957

See under *Hyla ewingii oberonensis* Copland.

Hyla ewingii oberonensis Copland, 1963

Proc. Linn. Soc. N.S.W. 88: 107, new name for *Hyla ewingii loveridgei* Copland 1957 (non Neill 1954).
= *Hyla verreauxii* Dumeril 1853.

PARATYPES: D7708-12, Little River, Suggan Buggan, Vict., collected C. W. Brazenor, 3 May 1949; D8698-701, Mt. Baw Baw, Vict., collected C. Tanner, 28 Feb. 1955.

NOTES: Zweifel (1958) transferred *Nyctimystes loveridgei* Neill, to the genus *Hyla*, necessitating Copland's name change.

Hyla gilleni Spencer,1896

Report of the Horn Expedition to Central Australia (hereinafter termed 'Horn Expedition'): 2: 173-4, Pl. 15, figs. 14-17.
= *Hyla caerulea* (White 1790).

HOLOTYPE: D9827, Alice Springs, N.T. (old no. 57806).

NOTES: Spencer mentions four specimens of this species. D9827 bears a label in his writing stating 'type', and must be the holotype. The three paratypes appear to have been lost.

Hyla maculata Spencer, 1901

Proc. Roy. Soc. Vict. 13: 177-8.

HOLOTYPE: D8498 from Poowong, Vict., collected R. Hall.

NOTES: Known only from the type until Copland (1961).

Family LEPTODACTYLIDAE

Genus **Notaden** Gunther, 1873

Notaden melanoscaphus Hosmer, 1962

Am. Mus. Novit. No. 2077: 1-8.

HOLOTYPE: D10144, Borroloola, N.T., collected W. Hosmer, 26 April 1960 (ex. American Mus. Nat. Hist. 67161).

NOTES: This taxon was erected on a single specimen. Additional specimens have since been collected by F. Parker from Strathgordon Homestead, Queensland.

Genus **Philoria** Spencer, 1901

Philoria frosti Spencer, 1901

Proc. Roy. Soc. Vict. 13: 176-7.

LECTOTYPE: D8497, Mt. Baw Baw, Vict., collected C. Frost.

NOTES: Seven specimens of this taxon were mentioned in the preamble to the description, which was apparently based on a single specimen. D8497 is the only specimen extant of those mentioned and is here designated lectotype.

Genus **Pseudophryne** Fitzinger, 1843

Pseudophryne dendyi Lucas, 1892

Proc. Roy. Soc. Vict. 4: 62-3.

NOTES: The holotype of this species has always been regarded as having been lodged in the National Museum collections. Harrison (1927) presumed that it had been lost as he could not locate it. A search through our old records fails to reveal any trace of it having been lodged here. The Melbourne University Zoology Department register lists this specimen as being No. 222, but as a search of the MUZD collection failed to find it, it is presumed to be lost.

Pseudophryne semimarmorata Lucas, 1892

Proc. Roy. Soc. Vict. 4: 63-4.

LECTOTYPE: D7196 male, Grampian Ranges, Vict., collected W. Kershaw 1887.

PARALECTOTYPES: D7195, Grampian Ranges, Vict., collected W. Kershaw 1887; D7234-7, Waterloo, Vict., collected J. A. Kershaw, March 1885; D7259, Ringwood, Vict., 12 Dec. 1890, donated E. H. Hennell.

NOTES: The lectotype selected is in the best condition of the type series, and is from the Grampian Ranges, the only locality mentioned in the formal description.

Family MICROHYLIDAE

Genus **Cophixalus** Boettger, 1892

Cophixalus exiguus Zweifel & Parker, 1969

Am. Mus. Novit. No. 2390: 1-10.

PARATYPES: D13170-2, Mt. Hartley, 23 m S. and 5 m E. of Cooktown, Qd., collected F. Parker, 10 June 1968.

Class REPTILIA

Order SQUAMATA

Suborder SAURIA

Family AGAMIDAE

Genus **Diporiphora** Gray, 1842

Diporophora amphiboluroides Lucas & Frost, 1902

Proc. Roy. Soc. Vict. 15: 76-7.
= *Diporiphora amphiboluroides.*

HOLOTYPE: D8813, W. Australia.

Diporophora winneckei Lucas & Frost, 1896

* *Horn Expedition* 2: 132, Pl. 12, fig. 5, Feb. 1896.
Proc. Roy. Soc. Vict. 8: 3-4, April 1896.
= *Diporophora winneckei.*

LECTOTYPE: D10156 male, Charlotte Waters, N.T., collected Horn Expedition, May-August 1894 (old nos. 57882 or 3).

PARALECTOTYPE: D10155 female same data as lectotype (old nos. 57882 or 3).

NOTES: The lectotype has been selected despite uncertainty as to which specimen was figured. The paralectotype has been eviscerated. The original labels on the specimens have the sexes reversed.

Genus **Physignathus** Cuvier, 1829

Physignathus lesueri howitti McCoy, 1884

Prod. Zool. Vict. Dec. 9: 7-10, Pl. 81.
= *Physignathus lesueurii* (Gray 1831).

LECTOTYPE: D1822, Upper Reaches of the Buchan River, Vict., collected A. Howitt, and figured in the original description.

NOTES: The remaining two specimens referred to by McCoy cannot be located.

Genus **Tympanocryptis** Peters, 1863

Tympanocryptis intima Mitchell, 1948

Rec. S. Aust. Mus. 9: 60-2, fig. 2.

PARATYPES: D1164-77, Central Australia, donated G. Horn, 23 June 1927.

NOTES: Mitchell quotes Nos. R1164-78, i.e. 15 specimens. Our records show that only 14 specimens were in fact sent to the author, and their registrations were prefixed with 'D'.

Tympanocryptis lineata pinguicolla Mitchell, 1948

Rec. S. Aust. Mus. 9: 70-2, fig. 6.

PARATYPES: D1338-9, D1848-9, Essendon, Vict.; D3482-3, mouth of Yarra River, Vict., and D7702, Essendon, Vict.

Tympanocryptis tetraporophora Lucas & Frost, 1895

Proc. Roy. Soc. Vict. 7: 265-6.

LECTOTYPE: D7701 from either Adminga or Dalhousie, S.A., collected Horn Expedition, May-August 1894 (old no. 57860).

NOTES: The authors had two specimens before them, and the paralectotype appears to have been lost. The lectotype has no locality data, excepting Central Australia, with its old registration entry. This explains the doubt re its locality. Mitchell (1948) considers this taxon to be a subspecies of *T. lineata* Peters 1863, while Storr (1964) gives it full specific rank.

Family GEKKONIDAE

Genus **Ceramodactylus** Blanford, 1874

Ceramodactylus daemeus Lucas & Frost, 1896

* *Horn Expedition* 2: 119-20, Pl. 9, fig. 2, Feb. 1896.
Proc. Roy. Soc. Vict. 8: 1-2, April 1896.
= *Diplodactylus daemeus.*

HOLOTYPE: D7528 from Charlotte Waters District, N.T., collected Horn Expedition, May-August 1894 (old no. 57846).

NOTES: Paratype MUZD No. 968 appears to have been lost.

Genus **Diplodactylus** Gray, 1832

Diplodactylus bilineatus Lucas & Frost, 1903

Proc. Roy. Soc. Vict. 15: 146-7.
= *Diplodactylus pulcher* (Steindachner 1870).

HOLOTYPE: D7570 female, Minilya Station, 80 m inland from Carnavon, W.A., donated T. Warr.

Diplodactylus byrnei Lucas & Frost, 1896

* *Horn Expedition* 2: 124, Pl. 12, fig. 2, Feb. 1896.
Proc. Roy. Soc. Vict. 8: 2-3, April 1896.

HOLOTYPE: D7534 male, Charlotte Waters, N.T., collected W. B. Spencer, May-August 1894 (old no. 57849).

Diplodactylus conspicillatus Lucas & Frost, 1897

Proc. Roy. Soc. Vict. 9: 55-6.

LECTOTYPE: D7535, Charlotte Waters, N.T., collected P. M. Byrne (old no. 57851).

Genus **Ebenavia** Boettger, 1879

Ebenavia horni Lucas & Frost, 1895

Proc. Roy. Soc. Vict. 7: 264-5, 1895.
= *Crenadactylus ocellatus* (Gray 1845).

HOLOTYPE: D7533, Charlotte Waters District, N.T., collected Horn Expedition, May-August 1894 (old no. 57576).

Genus **Hoplodactylus** Fitzinger, 1843

Hoplodactylus tuberculatus Lucas & Frost, 1900

Proc. Roy. Soc. Vict. 12: 145-6.
= *Crytodactylus louisiadensis* (De Vis 1892).

HOLOTYPE: D7874, Endeavour River, Qd.

Genus **Oedura** Gray, 1842

Oedura reticulata Bustard, 1969

West. Aust. Nat. 11: 82-6, figs. 1-2.

PARATYPES: D1689, D2450, Coolgardie, W.A., donated J. Frost. D2450 collected December 1897.

Family PYGOPODIDAE

Genus **Ophidiocephalus** Lucas & Frost, 1897

Ophidiocephalus taeniatus Lucas & Frost, 1897

Proc. Roy. Soc. Vict. 9: 54-5.

HOLOTYPE: D11761, Charlotte Waters, N.T., collected P. M. Byrne (old no. 57872). This appears to remain a unique specimen.

Family SCINCIDAE

Genus **Ablepharus** Fitzinger, 1823

Ablepharus lineo-ocellatus ruficaudus Lucas & Frost, 1895

Proc. Roy. Soc. Vict. 7: 269.
= *Morethia taeniopleurus* (Peters 1874).

LECTOTYPE: D11757 from either Goyder River or Bagot's Lagoon, C.A., collected Horn Expedition, May-August 1894 (old no. 57871).

NOTES: As two localities are mentioned in the Report of the Horn Expedition, uncertainty exists over the provenance of this specimen registered as from Central Australia. As only one specimen can be located, all paralectotypes appear to have been lost.

Genus **Egernia** Gray, 1838

Egernia slateri virgata Storr, 1968

J. Roy. Soc. W.A. 51: 60.

PARATYPE: D273, Central Australia.

Genus **Hemiergis** Wagler, 1830

Hemiergis woodwardi Lucas & Frost, 1902

Proc. Roy. Soc. Vict. 15: 77-8.

HOLOTYPE: D11772, West Australia. Apparently a unique specimen

Genus **Lygosoma** Gray, 1828

Lygosoma (Emoa) spenceri Lucas & Frost, 1894

Proc. Roy. Soc. Vict. 6: 81-2, Pl. 2, figs. 1-1a.
= *Pseudemoia spenceri.*

LECTOTYPE: D1824, Brandy Creek, Vict. (old no. 56193). Figured in original description.

PARALECTOTYPE: D3357, Dandenong Ranges, Vict. (old no. 56192).

NOTES: Fuhn (1967) lists a syntype in the British Museum (Natural History).

Lygosoma (Siaphos) maccoyi Lucas & Frost, 1894

Proc. Roy. Soc. Vict. 6: 85-6, Pl. 2, figs. 2-2a.
= *Siaphos maccoyi.*

LECTOTYPE: D1851, Ringwood, Vict. Figured in original description.

PARALECTOTYPES: D639, Dandenong, Vict.; D796, Trafalgar, Vict.; D920 and D2251, Ferntree Gully, Vict.; D1049, Goulburn Valley, Vict.; D1621-30, D1632-4, D1636 all from Waterloo, Vict., collected by D. Kershaw, March 1883; D2540-4, Blackspur, near Fernshaw, Vict., Dec. 1873; D2581, near Lakes Entrance, Vict., Jan. 1885; D2638-9, Brandy Creek, Vict.

Genus **Rhodona** Gray, 1839

Rhodona officeri McCoy, 1881

Prod. Zool. Vict. Dec. 6: 7-9, Pl. 51.
= *Lerista punctatovittata* Gunther 1867.

NOTES: Although McCoy stated that his Prodromus types were lodged in the Museum, there is no evidence that this specimen was, perhaps because at the time of describing it the type specimen was living. It must be presumed to have been lost.

Rhodona planiventralis Lucas & Frost, 1902

Proc. Roy. Soc. Vict. 15: 78-9.
= *Lerista planiventralis planiventralis.*

HOLOTYPE: D11763, West Australia, donated West Australian Museum.

Rhodona tetradactyla Lucas & Frost, 1895

Proc. Roy. Soc. Vict. 7: 268-9.
= *Lerista tetradactyla.*

HOLOTYPE: D11756, Tempe Downs, N.T., collected Horn Expedition, May-August 1894 (old no. 57867). Figured Pl. 12, fig. 3, Horn Expedition, Feb. 1896.

Family VARANIDAE

Genus **Varanus** Merrem, 1820

Varanus eremius Lucas & Frost, 1895

Proc. Roy. Soc. Vict. 7: 267-8.

HOLOTYPE: D9136, Idracowra, N.T., collected Horn Expedition, May-August 1894 (old no. 57863).

Varanus gilleni Lucas & Frost, 1895

Proc. Roy. Soc. Vict. 7: 266-7.

HOLOTYPE: D11759, between Glen Edith and Deering Creek, N.T., collected Horn Expedition, May-August 1894 (old no. 57865 or 6).

NOTES: The two specimens mentioned in the report of the Horn Expedition shared these numbers, the type being clearly labelled by the authors.

Varanus spenceri Lucas & Frost, 1903

Proc. Roy. Soc. Vict. 15: 145-6.

HOLOTYPE: D12350, 50 m N.E. of Tennant's Creek, N.T., collected W. B. Spencer on Spencer-Gillen Expedition 1901-2 (old no. R6563).

NOTES: No indication is given of the exact number of specimens used in erecting this taxon, excepting the type and at least two others. From our material, it is impossible to say which are paratypes, and for this reason none are listed.

Suborder SERPENTES

Family ELAPIDAE

Genus **Demansia** Gray, 1842

Demansia nuchalis tanneri Worrell, 1961

Proc. R. Zool. Soc. N.S.W. for 1958-9: 56-8, figs. b, d, e, f.
= *Demansia affinis tanneri.*

HOLOTYPE: D9819, Boxer Island, W.A., collected C. Tanner.

Genus **Denisonia** Krefft, 1869

Denisonia furva Brazenor, 1947

Mem. nat. Mus. Vict. 15: 128-30, fig. 1.
= *Parapistocalamus hedigeri* Roux 1934.

HOLOTYPE: D7738, Torokina, Bougainville Island, donated R. Clark.

PARATYPES: D11764-5, Bougainville Island, donated R. Clark.

NOTES: D11764 has skull missing, D11765 has no head.

Genus **Diemenia** Gunther, 1863

Diemenia aspidorhynchus McCoy, 1879

Prod. Zool. Vict. Dec. 3: 13-14, Pl. 23, figs. 4-4a.
= *Demansia nuchalis* (Gunther 1858).

HOLOTYPE: D12352, Junction of Murray and Darling Rivers, collected W. Blandowski (old nos. 3261 and R12802).

Diemenia microlepidota McCoy, 1879

Prod. Zool. Vict. Dec. 3: 12-13, Pl. 23, figs. 2-3a.
= *Oxyuranus scutellatus scutellatus* (Peters 1867).

LECTOTYPE: D12354, Junction of Murray and Darling Rivers, collected W. Blandowski (old nos. 493 and R12871), figured in original description.

PARALECTOTYPE: D12353, same data as lectotype (old nos. 3263 and R12870.)

NOTES: Both these specimens are in spirits with prepared skulls. Kinghorn (1955) based the genus *Parademansia* on them.

Genus **Furina** Dumeril, 1853

Furina bicuculata McCoy, 1879

Prod. Zool. Vict. Dec. 4: 13-15, Pl. 32, figs. 1-1h.
= *Demansia textilis* (D. & B. 1854).

LECTOTYPE: D1832, Longwood, Vict.

PARALECTOTYPES: D4610, D8939-42, Benalla, Vict.

Genus **Hoplocephalus** Wagler, 1830

Hoplocephalus flagellum McCoy, 1878

Prod. Zool. Vict. Dec. 2: 7-8, Pl. 11, figs. 1-1d.
= *Denisonia flagellum*.

LECTOTYPE: D4259, Boroondara, Vict. (= East Kew). Specimen 2 in original description.

PARALECTOTYPES: D4258, Boroondara, Vict.; D11973, South Brighton, Vict. (old no. 29611); D11974, Mount Martha, Vict. (old no. 29612); D11975, Prahran, Vict. (old no. 29614); D12356, Caulfield, Vict. (old no. R11048).

NOTES: The lectotype is chosen as it alone retains McCoy's original specimen number. Two of the paralectotypes cannot be located.

Hoplocephalus stirlingi Lucas & Frost, 1896

Horn Expedition 2: 149, Pl. 12, fig.5.
= *Denisonia suta* (Peters 1863).

SYNTYPE: D11758, Charlotte Waters, N.T., collected Horn Expedition, May-August 1894 (old no. 57099).

NOTES: At least four specimens were used in erecting this taxon. MUZD No. 978 from Alice Springs, N.T., is almost certainly one of these, but cannot be located. Depository of remainder of the series is unknown.

Genus **Hornea** Lucas & Frost, 1896

Hornea pulchella Lucas & Frost, 1896

Horn Expedition 2: 150, Pl. 12, fig. 6.
= *Rhinelaps fasciolatus* Gunther 1872.

HOLOTYPE: D11226, Charlotte Waters, N.T., collected Horn Expedition, May-August 1894 (old no. 57805).

Genus **Oxyuranus** Kinghorn, 1923

Oxyuranus scutellatus canni Slater, 1956

Mem. nat. Mus. Vict. 20: 202-5, Pl.

HOLOTYPE: D8614, Napa Napa, Port Moresby, New Guinea, collected K. Slater, 7 August 1953.

Genus **Pseudechis** Wagler, 1830

Pseudechis cupreus Boulenger, 1896

Catalogue of Snakes in the British Museum 3: 329-30.
= *Pseudechis australis* (Gray 1842).

SYNTYPE: D12711, Kewell, Vict. (old nos. 51873 and R12852).

NOTES: McCoy (1887, Pl. 142, figs. 1-1c) illustrated this specimen which is referable to *Demansia textilis* (D. & B.). Krefft's (1865) specimen from the Lower Darling, the other syntype, appears lost as Mackay (1955) apparently found no specimen from this area in the Australian Museum, Sydney.

Pseudechis platycephalus Thomson, 1933

Proc. zool. Soc. Lond. for 1933, p. 859, Pl. 3, figs. 1-2.
= *Pseudechis australis* (Gray 1842).

HOLOTYPE: D12355, East Alligator River, N.T., collected P. Cahill, Sept. 1914 (old no. R12694).

NOTES: This specimen is a head and neck in spirits, prepared skull, and plaster cast of head.

Genus **Vermicella** Gunther, 1859

Vermicella annulata snelli Storr, 1967

J. R. Soc. West Aust. 50, 3: 82.

PARATYPES: D10072-4, Roper River, N.T., collected J. Schultze.

Vermicella bertholdi littoralis Storr, 1967

J. R. Soc. West. Aust. 50, 3: 84.

PARATYPE: D12402, Shark's Bay, W.A. (old no. R817).

Family TYPHLOPIDAE

Genus **Typhlops** Oppel, 1811

Typhlops grypus Waite, 1918

Rec. S. Aust. Mus. 1: 17-18, fig. 7.

HOLOTYPE: D12351, no data (old no. R7102).

PARATYPE: D12358, Marble Bar, NW. Aust. (old no. R7200).

NOTES: The paratype was before Waite at the time of describing the taxon, as proved by correspondence from him to the Museum dated 14 May 1918.

* The Report of the Horn Expedition was actually published before the authors' 'original description' and so becomes the original description.

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References

BOULENGER, G. A., 1887. Catalogue of Lizards in the British Museum, vol. 3.

————, 1896. Catalogue of Snakes in the British Museum, vol. 3.

COCHRAN, D. A., 1961. Type Specimens of Reptiles and Amphibians in the United States National Museum. *Bull. U.S. Nat. Mus.* 220.

COPLAND, S. J., 1957. Australian Tree Frogs of the Genus *Hyla*. *Proc. Linn. Soc. N.S.W.* 82: 9-108.

————, 1961. Re-discovery of a little known Victorian frog. *Proc. Linn. Soc. N.S.W.* 86: 258-61.

DIXON, J. R., and KLUGE, A. G., 1964. A New Gekkonid Lizard Genus for Australia. *Copeia*: 174-80.

FUHN, I. E., 1967. *Pseudemoia*, eine neue monotypische Gattung aus Südostaustralien (*Ablepharus/Emo/aspenceri* Lucas & Frost 1894). *Zool. Anz.* 179: 243-7.

————, 1969. The 'Polyphyletic' Origin of the Genus *Ablepharus* (Reptilia: Scincidae): a Case of Parallel Evolution. *Z. zool. Syst. Evolutf.* 7: 67-76.

GREER, A. E., 1967. A New Generic Arrangement for some Australian Scincid Lizards. *Breviora*, No. 267: 1-19.

HARRISON, L., 1927. Notes on some Western Australian frogs, with descriptions of new species. *Rec. Aust. Mus.* 15: 277-87.

KINGHORN, J. R., 1955. A New Generic Name for Two Nominal Species of *Pseudechis*. *Rec. Aust. Mus.* 23: 184-5.

KLUGE, A. G., 1963. The Systematic Status of Certain Australian and New Guinea Gekkonid Lizards. *Mem. Qd. Mus.* 14: 77-86.

————, 1967. Systematics, phylogeny and zoogeography of the lizard genus *Diplodactylus* Gray (Gekkonidae). *Aust. J. Zool.* 15: 1007-108.

KREFFT, G., 1865. The Vertebrata of the Lower Murray and Darling, pp. 1-33.

LITTLEJOHN, M. J., 1967. Patterns of zoogeography and speciation in south-eastern Australian Amphibia. Pp. 150-174 in A. H. Weatherley (ed.), Australian Inland Waters and their Fauna. A.N.U. Press, Canberra.

LOVERIDGE, A., 1934. Australian Reptiles in the Museum of Comparative Zoology, Cambridge, Massachusetts. *Bull. Mus. Comp. Zool. (Harvard)* 77: 243-383.

MACKAY, R. D., 1955. A Revision of the Genus *Pseudechis*. *Proc. R. Zool. Soc. N.S.W.* for 1953-54, pp. 15-23.

McCoy, F., 1887. Prodromus of the Zoology of Victoria, Decade 15.
Mitchell, F. J., 1948. A Revision of the Lacertilian Genus *Tympanocryptis*. *Rec. S. Aust. Mus.* 9: 57-86.
Mittleman, M. B., 1952. A Generic Synopsis of the Lizards of the Subfamily *Lygosominae*. *Smithson. misc. Coll.* 117 (17): 1-35.
Moore, J. A., 1961. The Frogs of Eastern New South Wales. *Bull. Am. Mus. Nat. Hist.* 121: 153-385.
Neave, S. A., 1939-40. *Nomenclator Zoologicus*, vols. 1-4.
Smith, M. A., 1937. A Review of the Genus *Lygosoma* (Scincidae: Reptilia) and its Allies. *Rec. Indian Mus.* 39: 213-234.
Storr, G. M., 1964. The agamid lizards of the genus *Tympanocryptus* in Western Australia. *J. R. Soc. W. Aust.* 47: 43-50.
———, 1967. The Genus *Vermicella* (Serpentes, Elapidae) in Western Australia and the Northern Territory. *J. R. Soc. W. Aust.* 50: 80-92.
Waite, E. R., 1929. Reptiles and Amphibians of South Australia, pp. 1-270.
Williams, E. E., and Parker, F., 1964. The snake genus *Parapistocalamus* on Bougainville, Solomon Islands. *Senck. Biol.* 45: 543-52.
Zweifel, R. G., 1958. Frogs of the Papuan Hylid Genus *Nyctimystes*. *Am. Mus. Novit.* 1896.

CATALOGUE OF AUSTRALIAN TERTIARY MOLLUSCA (EXCEPT CHITONS)

By Thomas A. Darragh
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Introduction

The object of this catalogue is to list all species of mollusca (except chitons) which have been described from Australian Tertiary marine strata. The chitons have been excluded as they have already been listed by Cotton and Godfrey (1940) and again by Cotton (1964) though not in the same format as the listing in this catalogue. Initally it was hoped to provide a proper checklist but it was obvious that insufficient is known of the relationships of many of the species so that much of the value of a checklist was missing. However, this catalogue can serve as a basis for future work on a proper checklist, and for this reason it has been published so that the information is available to any interested worker.

Entries are in alphabetical order of species. The specific name is cited first followed by the generic name and the combination is that given in the original description. On the right hand side of the page the genus is given in which it is thought the species should be placed. In some cases these modern generic allocations have been taken from the literature and in others have been made by the author. Many of them are no doubt as correct as is possible on our current knowledge of the taxonomy of Australian Recent and Tertiary mollusca but many will be far from correct and it is hoped that this catalogue will stimulate workers to bring the nomenclature up to date. The author will therefore appreciate the communication of any corrections, additions and/or alterations which they consider should be made. In the second line of the entry the author, date and reference to the original description is given followed by the type locality of the species.

Further information on type localities can be found in Singleton (1941) which also has an extensive bibliography of the Australian Tertiary. For information subsequent to this date the reference to the original description of the species will probably suffice, complemented by the Lexique Stratigraphique 6 (5c) Victoria and the Geology of Victoria published by the Geological Society of Australia.

The references (which virtually make up a bibliography of Australian Tertiary mollusca) have been divided into two parts, the first consisting of references dealing with genera, revisions of groups and types but which do not have new specific names therein and a second part of references cited in the catalogue itself.

Acknowledgments

Dr C. A. Fleming originally suggested to the author that a modern catalogue or checklist of Australian Teritary mollusca would be useful and the author thanks him for his encouragement.

General References

Chapman, F., 1915. Note on a large specimen of *Conus dennanti* Tate. *Victorian Nat.* 32: 5-6.

———, 1929. On the flanged cowry, *Palliocypraea gastroplax*. *Proc. Roy. Soc. Vict.* 41: 202-205, pl. 19-20.

Cotton, B. C., 1947. Australian Recent and Tertiary Turridae. *Pub. Field Naturalist Sec. R. Soc. S. Aust. conch. Club.* 4.

———, 1951. Australian Recent and Tertiary mollusca. Family Cerithiopsidae. *Rec. S. Aust. Mus.* 9: 383-395, pl. 28.

———, 1952. Australian Recent and Tertiary mollusca (Terebridae, Rissoinidae, Rissoidae, Fasciolariidae Volutidae). *Trans. R. Soc. S. Aust.* 75: 38-54, pl. 3-4.
———, 1952. The mollusca of the Adelaidean Stage. *Bull. geol. Surv. S. Aust.* 27: 239-249.
———, 1954. Family Cassididae. *Pub. malac. Sect. R. Soc. S. Aust.* 4.
———, 1955. Family Olividae. *Ibid.* 6.
———, 1955. Family Nassariidae *Ibid.* 7.
———, 1956. Family Scalidae *Ibid.* 9.
———, 1956. Family Buccinidae *Ibid.* 10.
———, 1957. Family Fasciolariidae *Ibid.* 11.
———, 1957. *Australian Recent and Tertiary species of the molluscan family Volutidae.* Adelaide, author.
———, 1957. Family Turritellidae. *Pub. malac. Soc. Aust.* 3.
———, 1957. Family Cymatiidae. *Ibid.* 4.
———, 1957. *Australian Recent and Tertiary species of the molluscan family Pyrenidae.* Adelaide, author.
———, 1957. Family Mitridae. *Pub. malac. Sec. R. Soc. S. Aust.* 12.
———, 1958. *Australian Recent and Tertiary species of the molluscan family Conidae* Adelaide, author.
———, 1959. Family Potamididae. *Pub. malac. Sect. R. Soc. S. Aust.* 13.
———, 1959. *South Australian Mollusca. Archaeogastropoda.* Adelaide, Government Printer.
———, 1961. *South Australian Mollusca. Pelecypoda.* Adelaide, Government Printer.
———, 1964. *South Australian Mollusca. Chitons.* Adelaide, Government Printer.
———, and Godfrey, F. K., 1838. *The molluscs of South Australia, Part I. Pelecypoda.* Adelaide, Government Printer.
———, ———, 1940. The molluscs of South Australia, Part II. *Scaphopoda, Cephalopoda, Aplacophora and Crepipoda.* Adelaide, Government Printer.
———, and Woods, N. H. 1933. Remarks on the new harpid (mollusca) genera of Finlay and Iredale. *Rec. S. Aust. Mus.* 5: 45-47.
Darragh, T. A., 1965. Hinge transposition in *Eucrassatella* (Pelecypoda: Crassatellidae) *Proc. Roy. Soc. Vict.* 79: 89-90, pl. 7.
Finlay, H. J., 1924. List of recorded relationships between Australian and New Zealand mollusca. *Rep. Australas. Ass. Advmt. Sci.* 16: 332-343.
———, 1931. On *Turbo posulatus* Bartrum: Does it indicate a Pliocene connection with Australia? *Trans. N.Z. Inst.* 57: 1-6.
Laseron, C. F., 1957. A new classification of the Australian Marginellidae (Mollusca), with a review of species from the Solanderian and Dampierian Zoogeographical provinces. *Aust. J. mar. Freshwat. Res.* 8: 274-311, text. figs.
Ludbrook, N. H., 1959. Revision of the Tate molluscan types. Scaphopoda. *Trans. R. Soc. S. Aust.* 82: 141-149, pl. 1-2.
———, 1961. Revision of the Tate molluscan types. Pelecypoda—Nuculidae and Nuculanidae. *Ibid.* 85: 55-65, pl. 1-3.
———, 1965. Revision of the Tate molluscan types. Part 3. Limopsidae, Glycymeridae, Arcidae, Cucullaeidae. *Ibid.* 89: 81-105, pl: 1-5.
———, 1967. Tertiary molluscan types from Table Cape in the Tasmanian Museum, Hobart. *Pap. Proc. R. Soc. Tasm.* 101: 65-69, pl. 1-4.
Marwick, J., 1952. *Singletonaria*, a new genus of the Struthiolariidae from the Australian Pliocene. *Proc. malac. Soc. Lond.* 29: 83-85.
———, 1957. Generic revision of Turritellidae. *Ibid.* 32: 144-166.
May, W. L., 1919a. Critical remarks on the Table Cape fossil mollusca in the Johnston collection with figures. *Pap. Proc. R. Soc. Tasm.* for 1918: 69-73, pl. 8-11.
———, 1919b. A revised census of the Mollusca and Brachiopoda in the Table Cape beds. *Ibid.* for 1918: 101-107.
Powell, A. W. B., 1942. The New Zealand Recent and Fossil Mollusca of the family Turridae *Bull. Auckland Inst. Mus. 2.*
———, 1964. The family Turridae in the Indo-Pacific. Part 1. The sub-family Turrinae. *Indo-Pacif. Mollusca* 1 (5): 227-345.
———, 1966. The molluscan families Speightiidae and Turridae. *Bull. Auckland Inst. Mus.* 5: 1-184, pl. 1-23.
———, 1969. The family Turridae in the Indo-Pacific. Part 2. The sub-family Turriculinae. *Indo-Pacif. Mollusca* 2 (10): 215-415.
Schilder, F. A., 1927. Revision der Cypraecea (Moll., Gastr.) *Arch. Naturgesch.* (A) 91 (10): 1-165.
Singleton, F. A., 1941. The Tertiary geology of Australia. *Proc. Roy. Soc. Vict.* 53: 1-125, pl. 1-3.
———, 1945. A catalogue of type and figured specimens of fossils in the Melbourne University Geology Department. *Ibid.* 56: 229-284.

TEICHERT, C., 1947. Notes on Eocene nautiloids from Victoria. *Min. geol. J.* 3 (1): 40-43, fig. 1-6.
VELLA, P., 1961. Australian Typhinae (Gastropoda) with notes on the sub-family. *Palaeontology* 4: 362-391, pl. 46-47.

Class Scaphopoda

acriculum Entalis — *Laevidentalium*
Tate 1887b, p. 192, pl. 20, fig. 11. Lower beds, Muddy Creek.

acuminatus Cadulus — *Gadila*
Tate 1887b, p. 194.
Ludbrook 1959, p. 147, pl. 1, fig. 7. Upper beds, Aldinga.

adelaidense Siphonodentalium (Pulsellum) — *Pulsellum*
Ludbrook 1956, p. 4, pl. 1, fig. 1. 450-487 ft. Hindmarsh Bore, Adelaide.

annulatum Entalis = *Dentalium australis* Sharp & Pilsbry 1898
Tate 1887b, p. 191, pl. xx, fig. 6 a, b, non Gmelin 1788. Lower beds, Muddy Creek.

aratum Dentalium — *Dentalium*
Tate 1887b, p. 192, pl. 20, fig. 8. River Murray near Morgan.

australis Dentalium — *Laevidentalium*
nom. nov. for *Entalis annulatum* Tate 1887 non Gmelin 1788. Sharp & Pilsbry 1898, p. 199.

bifrons Dentalium (?) — *Antalis*
Tate 1887b, p. 192, pl. xx, fig. 5.

denotatum Dentalium (Antalis) — *Antalis*
Ludbrook 1956, p. 3, pl. 1, fig. 7-9. Abattoirs Bore, Adelaide.

howchini Dentalium — *Dentalium*
Cotton & Ludbrook 1938, p. 224, pl. 12, fig. 6. Abattoirs Bore, Adelaide.

gracilicostatum Dentalium (Fissidentalium) — *Fissidentalium*
Singleton 1943, p. 275, pl. xiii, fig. 9 a, b; pl. xii, fig. 6 a, b. Bay NW of Pebble Point.

infans Cadulus (Gadila) — *Gadila*
Tate 1899b, p. 266, pl. viii, fig. 11. Upper beds, Muddy Creek.

lacteolum Dentalium (Laevidentalium) — *Laevidentalium*
Tate 1899b, p. 264. Lower beds, Muddy Creek.

largicrescens Dentalium (Laevidentalium) — *Laevidentalium*
Tate 1899b, p. 264, pl. viii, fig. 10-10c. Beaumaris.

latesulcatum Dentalium — *Dentalium*
Tate 1899b, p. 262, pl. viii, fig. 9. Grange Burn.

mawsoni Dentalium (Fissidentalium) — *Fissidentalium*
Ludbrook 1956, p. 2, pl. 1, fig. 5, 6. River Murray cliffs near Morgan.

mucronatus Cadulus — *Gadila*
Tate 1887b, p. 193, pl. xx, fig. 10. Lower beds, Muddy Creek.

pictile Dentalium (Laevidentalium) — *Laevidentalium*
Tate 1899b, p. 263, pl. viii, fig. 8. Table Cape.

sectiforme Dentalium (Graptacme) *Antalis*

Tate 1899b, p. 262, pl. viii, fig. 6-6a. Upper beds, Muddy Creek.

semiaratum Dentalium *Dentalium*

Chapman & Crespin 1928, p. 105, pl. iii, fig. 28. 719 ft. Sorrento Bore.

subfissura Entalis *Laevidentalium*

Tate 1887b, p. 191, pl. xx, fig. 4 a, b. River Murray Cliffs near Morgan.

tatei Dentalium *Gadilina*

nom. nov. for *Dentalium triquetrum* Tate 1887 non Brocchi 1814 Sharp & Pilsbry 1898, p. 218.

tornatissimum Dentalium (Episiphon) *Fustiaria*

Tate 1899 b, p. 265, pl. viii, fig. 7-7a. Gippsland Lakes.

triquetrum Dentalium (?) = *Dentalium tatei* Sharp & Pilsbry 1898

Tate 1887b, p. 193, pl. xx, fig. 3, non Brocchi 1814. Adelaide Bore, Kent Town.

yatalensis Cadulus (Dischides) *Dischides*

Ludbrook 1956, p. 4, pl. 1, fig. 3, 4. Weymouth Bore 310-330 ft., Adelaide.

Cephalopoda

altifrons Nautilus *Eutrephoceras*

Chapman 1915b, p. 356, pl. v, fig, 10-12, pl. vi, fig. 13. Murray River Cliffs.

attenuata Aturia clarkei *Aturia*

Teichert and Cotton 1949, p, 255, pl. xxi. Christie Beach, Port Noarlunga.

australis Aturia ziczac *Aturia*

McCoy 1876a, p. 21, pl. xxiv, figs. 1-5. Mt. Martha; AW 9; Ad. 22.

bakeri Deltoidonautilus *Aturia clarkei*

Teichert 1947b, p. 48, fig. 1-3. ½ mile NW. of Point Ronald.

balcombensis Nautilus *Eutrephoceras*

Chapman 1915b, p. 353, pl. iii, fig. 3, 4, pl. iv, fig. 5, 6, pl. viii, fig. 18, 19. Balcombe Bay.

brunnschweileri Aturoidea *Aturoidea*

Glenister, Miller & Furnish 1956, p. 500, pl. 55, fig. 1, 2, 5, 6, pl. 56, fig. 1, 2. 12 miles ENE. Bullara Homestead GIR-1 Giralia Range, W.A.

clarkei Aturia *Aturia*

Teichert 1944, p. 79, pl. 15, fig. 1-4, pl. 16, fig. 1-2, text fig. 2. Eastern scarp Kennedy Range, W.A.

cliftonensis Notosepia *Notosepia*

Type species of genus

Chapman 1915b, p. 357, pl. vii, fig. 16, 17, pl. viii, fig. 20-22. Clifton Bank, Muddy Creek.

curta Spirulirostra *Spirulisostra*

Tate 1894, p. 170, pl. x, fig. 1. Bird Rock Bluff.

distans Aturoidea *Aturoidea*

Teichert 1943, p. 260, pl. xi, fig. 1-4. Second point NW. of Pebble Point.

felix Nautilus — *Cimomia*

Chapman 1915b, p. 357, pl. vi, fig. 14, pl. vii, fig. 15. Happy Valley, South Australia.

geelongensis Nautilus — *Eutrephoceras*

Foord 1891, p. 332, fig. 69. Near Geelong.

prora Teichertia — *Teichertia*

Type species of genus

Glenister, Miller & Furnish 1956, p. 497, pl. 54, fig. 1-8. 2 miles E. of Bullara Station Boundary, Giralia Range, W.A.

stansburiensis Aturia. — *Aturia*

Glaessner 1955, p. 357, pl. 34, fig. 1 a, b. Stansbury, Yorke Peninsula.

victorianus Nautilus — *Eutrephoceras*

Teichert 1943, p. 262, pl. xi, fig. 5-7. Second point NW. of Pebble Point.

yorkensis Cimomia — *Cimomia*

McGowran 1959, p. 445, pl. 66, fig. 5-8, text fig. 11. Yorke Peninsula.

Bivalvia

abbreviata Crassatella — *Salaputium*

Tate 1886b, p. 147, pl. 11, fig. 16. River Murray Cliffs near Morgan.

acinaciformis Leda — *Scaeoleda*

Tate 1886b, p. 130, pl. 5, fig. 6, a-b. Upper beds, Muddy Creek.

acuticauda Leda — *Sacella*

Pritchard 1901, p. 27, pl. 3, fig. 4-4a. Grice Creek.

acuticostata Trigonia — *Neotrigonia*

McCoy 1866b, p. 482, fig. 1. 1875b, p. 21, pl. 19, fig. 1-2. Mordialloc (Beaumaris).

adelaidensis Cleidothaerus — *Cleidothaerus*

Cotton 1947, p. 664, pl. 20, fig. 23-24. Weymouth Bore 450 ft.

adelaidensis Corbula — *Notocorbula*

nom. nov. for *Corbula equivalvis* Woods 1931 non Philippi 1836. Ludbrook 1955, p. 78, pl. 6, fig. 11. Abattoirs Bore, Adelaide.

adelaidensis Cucullaea — *Cucullaea*

Tate 1886b, p. 144, pl. 11, fig. 14. Adelaide Bore, Kent Town.

adelaidensis Lentipecten — *Lentipecten*

Ludbrook 1955, p. 32, pl. 1, fig. 13 a-c. Abattoirs Bore, Adelaide.

adelaidensis Litigiella — *Litigiella*

Ludbrook 1955, p. 57. pl. 3, fig. 11. Hindmarsh Bore 450-487 ft. Adelaide.

adelaidensis Modiola — *Modiolus*

Tate 1886b, p. 123, pl. 11, fig. 3. Adelaide Bore, Kent Town.

adelaidensis Neaera — *Cuspidaria*

Tate 1887a, p. 178, pl. 19, fig. 8. Adelaide Bore, Kent Town.

aequalis Psammobia — *Gari*

Tate 1885a, p. 4. 1887a, p. 168, pl. 16, fig. 10. Upper beds, Muddy Creek.

angustior Myodora — *Myadora*

Tate 1887a, p. 174, pl. 16, fig. 16. Upper beds, Muddy Creek.

antecedens Notochlamys — *Notochlamys*

nom. nov. for *Pecten praecursor* Chapman 1912 non Dall 1898 Singleton 1941, p. 427. Spring Creek.

antiaustralis Pecten — *Chlamys*

Tate 1886b, p. 106, pl. 9, fig. 7 a-c. Upper beds, Aldinga.

antisemigranulatum Cardium (Protocardium) — *Pratulum*

McCoy 1877, p. 16, pl. 44, fig. 2-3. Moorabool near Geelong.

aphrodina Crassatella — *Eucrassatella oblonga*

Tenison Woods 1876, p. 24. pl. fig. 12. Upper bed, Table Cape.

apiculata Leda — = *Nuculana chapmani* Finlay 1924

Tate 1886b, p. 131, pl. 9, fig. 4 a-b. non J. de C. Sowerby 1836. Turritella clays, Blanche Pt., Aldinga.

aporema Cuna — *Cuna*

Cotton 1947, p. 662, pl. 20, fig. 7-8. Bore 41, S.A. Dept. Mines 405-407 ft.

araea Lucina — *Gonimyrtea*

Tate 1887a, p. 143, pl. 19, fig. 9. Oyster banks, Aldinga Cliffs.

araneosa Lucina — *Epicodakia*

Tate 1887a, p. 144, pl. 20, fig. 13. Lower beds, Muddy Creek.

arcacea Modiolaria — *Lanistina*

Tate 1886b, p. 125, pl. 9, fig. 2 a-b, Turritella grit, Ardrossan.

arcaeformis Cardium — *Glans*

Chapman & Crespin 1934 p. 121, pl. 11, fig. 25-27. Albany.

archaenepeanensis Venericardia — *Pleuromeris*

Chapman & Crespin 1928, p. 102, pl. 11, fig. 79. Sorrento Bore. 674 ft.

arenicola Ostrea — *Ostrea*

Tate 1886b, p. 97, pl. 10, fig. 6. Upper beds, Aldinga.

arenicola Spondylus — Invalid name change

nom. nov. for *Pecten spondyloides* Tate 1882. Tate in Tate, Howchin and David 1896, p. 318.

astartiformis Crassatella. — = *Crassatella communis* Tate 1896.

Tate 1886b, p. 147, pl. 11, fig. 12, 15. non Nyst 1847. Aldinga; Adelaide Bore; River Murray Cliffs; Muddy Creek; Mornington.

atkinsoni Amusium — *Propeamussium*

Johnston 1880, p. 41. Table Cape.

atkinsoni Portlandia — *Pronucula*

Johnston 1880, p. 39. Table Cape.

australica Lahillia — *Lahillia*

Singleton 1943, p. 273, pl. 12, fig. 3-5. Second point N.W. of Pebble Point.

australica Pholadomya — *Pholadomya*

Tate 1894, p. 187, pl. 12, fig. 2, 2a. Fyansford; Lower beds, Muddy Creek.

aequilatera Tellina = *Tellina ralphi Finlay 1927*

Tate 1887a, p. 166, pl. 16, fig. 5 a-b; 9 a-b; pl. 20, fig. 19. non Koch & Dunbar 1837. Upper beds Muddy Creek.

aequilateralis Myodora *Myadora*

Johnston 1880, p. 40. Table Cape.

affinis Lucina = *Lucina balcombica* Cossmann 1912

Tate 1887a, p. 143, pl. 18, fig. 11. non Eichwald 1830. Oyster Banks, Nor' West Bend, River Murray.

affinitalis Limopsis *Limopsis*

Chapman & Crespin 1928, p. 96, pl. 3, fig. 14. Sorrento Bore 719 ft.

agnewi Lyonsia *Panope*

Tenison Woods 1876, p. 25, fig. 13. Table Cape.

alata Mytilicardia *Cardita*

Tate 1886b, p. 149, pl. 2, fig. 12. Adelaide Bore, Kent Town.

albinelloides Tellina *Tellina*

Tate 1887a, p. 164, pl. 16, fig. 4 a-b. Upper beds, Muddy Creek.

aldingae Laciolina *Laciolina*

Ludbrook 1959b, p. 229, pl. 2, fig. 4. Aldinga Bay, Pliocene.

aldingensis Pecten *Chlamys*

Tate 1886b, p. 109, pl. 7, fig. 1 a-c. Lower beds, Aldinga Bay.

aldingensis Salaputium *Salaputium*

nom. nov. for *Crassatella corrugata* Tate 1886 non Adams & Reeve 1850. Finlay 1930, p. 38.

aldingensis Spondylus Invalid name change

nom. nov. for *Pecten spondyloides* Tate 1882. Tate in Tate and Dennant 1896, p. 121.

alea Myadora *Myadora*

Cotton 1947, p. 665, pl. 20, fig. 20-22. Salisbury Bore 330 ft.

allporti Venus *Callanaitis*

Tenison Woods 1876, p. 26, fig. 10. Table Cape.

alticosta Limea *Limea*

Tate 1886b, p. 120, pl. 3, fig. 8. Adelaide Bore, Kent Town.

anatinaeformis Phragmorisma *Phragmorisma*

Tate 1894, p. 189, pl. 12, fig. 1, 1a. Table Cape; Spring Creek.

ancisa Notocallista (Fossacallista) *Fossacallista*

Marwick 1938, p. 77, pl. 14, fig. 11. Grice Creek.

angustata Zenatiopsis *Zenatiopsis*

Type species of genus

Tate 1879, p. 129, pl. 5, fig. 6 a-b. River Murray cliffs near Morgan.

angustifrons Limarca *Limarca*

Type species of genus

Tate 1886b, p. 135, pl. 8, fig. 5 a-b. Lower beds Aldinga; Adelaide Bore, Kent Town.

australis Myodora — *Myadora*
Johnston 1880, p. 40. Table Cape.

australis Strigilla
Tate 1887a, p. 167, pl. 19, fig. 6. Lower beds, Muddy Creek.

axiniformis Mactra — *Mactra*
Tate 1887a, p. 170, pl. 17, fig. 1 a-b. Upper beds, Muddy Creek.

baileyana Spondylus — *Spondylus*
Chapman 1922, p. 7, pl. 2, fig. 11. Beaumaris.

balcombei Modiolaria — *Musculus*
Pritchard 1901, p. 29, pl. 3, fig. 2. Cement works. Balcombe Bay.

balcombensis Diplodonta — *Diplodonta*
nom. nov. for *Diplodonta subquadrata* Tate 1887 non Carpenter 1885. Pritchard 1906, p. 117.

balcombica Lucina — *Callucina*
nom. nov. for *Lucina affinis* Tate 1886 non Eichwald 1830. Cossmann 1912a, p. 214.

basedowi Tellina — *Macomona*
Tate in Basedow 1901, p. 148, pl. 3. Type lost, neotype from Giles Point near Edithburgh. Ludbrook 1959b, p. 229, pl. 4, fig. 3-4.

bassii Lima — *Lima*
Tenison Woods 1877, p. 112. Table Cape.

beaumariensis Limopsis — *Limopsis*
Chapman 1911, p. 423, pl. 84, fig. 6; pl. 85, fig. 12. Beaumaris.

bernardi Philobrya — *Cosa*
Tate 1898d, p. 88, pl. 4, fig. 10. Muddy Creek; Shelford; Curlewis; Fyansford. Tate 1899, p. 277 cites Belmont as the type locality.

brevis Lithodomus — *Lithophaga*
Tate 1887a, p. 186. Ludbrook 1955, p. 79, pl. 6, fig. 13. Hallet's Cove.

brevispina Plicatula — *Plicatula*
Chapman 1922, p. 6., pl. 1, fig. 8. Lower beds, Muddy Creek.

brevitergum Nucula — *Ennucula*
Chapman & Singleton 1927, p. 114, pl, 10, fig. 1 a-b. Lower beds, Muddy Creek.

cainoizoica Cucullaea — *Glycymeris*
Tenison Woods 1877, p. 111. Table Cape.

cainozoica Tellina — *Tellina*
Tenison Woods 1877, p. 113. Table Cape.

cainozoica Venus (Chione) — *Hina*
Tenison Woods 1877, p. 113. Table Cape.

cainozoicus Macrodon — *Notogrammatodon*
Tate 1886b, p. 143, pl. 10, fig.4. Lower beds, Muddy Creek.

calva Cardita — *Vimentum*
Tate 1887a, p. 189, pl. 20, fig. 14. Upper beds, Muddy Creek.

camurus Crassatellites *Eucrassatella*
Pritchard 1903a, p. 96, pl. 14, fig. 5-9. Between Forsyth's and Henty's Grange Burn.

capulopsis Arca *Arca*
Pritchard 1901, p. 23, pl. 2, fig. 1-2. Orphanage Hill, Fyansford.

celleporacea Barbatia *Acar*
Tate 1886b, p. 141, pl. 10, fig. 10. Mornington.

chapmani Limopsis *Limopsis*
Singleton 1932, p. 296, pl. 24, fig. 12-14; pl. 25, fig. 16. Lower beds, Bird Rock Cliffs.

chapmani Nuculana *Saccella*
nom. nov. for *Leda apiculata* Tate 1886 non J. de C. Sowerby 1836 Finlay 1924. p. 107.

chavani Monitilora (Prophetilora) *Prophetilora*
Ludbrook 1955, p. 47, pl. 2, fig. 13. Abattoirs Bore, Adelaide.

cincturata Lissarca *Lissarca*
Chapman and Crespin 1928, p. 97, pl. 3, fig. 15. Sorrento Bore 1,107 ft.

cognata Chione *Proxichione*
Pritchard 1903a, p. 101, pl. 12, fig. 5. Grenge Burn below Forthsyth's

coma Acar *Acar*
Cotton 1947, p. 657, pl. 20, fig. 25, 26. Weymouth Bore 345-350 ft.

communis Crassatella *Salaputium*
nom. nov. for *Crassatella astatiformis* Tate 1886 non Nyst 1847. Tate in Tate and Dennant 1896, p. 129.

compacta Cardita *Scalaricardita*
Tate 1886b, p. 151, pl. 2, fig. 13. Muddy Creek.

compta Mytilicardia *Cardita*
Tate 1886b, p. 149, pl. 12, fig. 2. Upper beds, Muddy Creek.

confirmans Eomiltha (Gibbolucina) *Gibbolucina*
Ludbrook 1955, p. 49, pl. 2, fig. 11. Hindmarsh Bore 450-487 ft., Adelaide.

consobrinus Pecten *Equichlamys*
Tate 1886b, p. 104, pl. 3, fig. 6. Upper beds, Aldinga.

consutilis Barbatia *Barbatia*
Tate 1886b, p. 142, pl. 2, fig. 15. Lower beds, Muddy Creek.

convexus Pectunculus *Tucetona*
Tate 1886b, p. 138, pl. 11, fig. 7 a-b. Upper beds, Muddy Creek.

cordata Pinna *Atrina (Servatrina)*
Pritchard 1895, p. 228, pl. 12, fig. 4-5. Barwon River near junction with Native Hut Creek.

corioensis Chione *Katelysia*
Tate 1887a, p. 157, pl. 16, fig. 1. Corio Bay. Geelong.

corioensis Cucullaea *Cucullaea*
McCoy 1876a, p. 32, pl. 27, figs. 3-5b. Ad 23, Bird Rock bluff, Torquay.

corioensis Hinnites — *Hinnites*
McCoy 1879, p. 31, pl. 58 Ad 15, Corio Bay.

corioensis Modiolaria — *Lanistina*
Tate 1886b, p. 126, pl. 3, fig. 4. Corio Bay.

corioensis Salaputium — *Salaputium*
Chapple 1934, p. 162, pl. 19, fig. 1, 1a. West Beach. Corio Bay.

corrugata Crassatella = *Salaputium aldingensis* Finlay 1930
Tate 1886b, p. 147, pl. 2, fig. 14. non Adams & Reeve 1850. Lower beds Aldinga.

corrugata Myodora — *Myadora*
Tate 1887a, p. 175, pl. 17, fig. 11 a-b. Upper beds, Muddy Creek.

crama Tucetona — *Tucetona*
Cotton 1947, p. 660, pl. 20, fig. 1, 2. Abattoirs Bore, Adelaide.

crassa Chamostrea — *Cleidothaerus*
Tate 1885b, p. 228. Table Cape.

crassicardia Meleagrina — *Pinctada*
Tate 1886b, p. 121, pl. 9, fig. 9, 10. North-west Bend Head Station, River Murray.

crassior Gonimyrtea — *Gonimyrtea*
Ludbrook 1955, p. 51, pl. 3, fig. 3, 4. Weymouth Bore 310-330 ft. Adelaide.

crassum Lepton — *Litigiella*
Tate 1879, p. 130, pl. 5, fig. 9. River Murray near Morgan.

crebrecostata Leda — *Scaeoleda*
Tenison Woods 1877, p. 112, Table Cape.

crebresquamata Lima (Limatula) — *Limatula*
Tate 1899b, p. 274. Spring Creek.

crustata Barbatia — *Acar*
Tate 1886b, p. 140, pl. 2, fig. 16. Cadell Marl Lens, Ludbrook 1965, p. 99.

cuculloides Cardium — *?*
Tate 1886b, p. 158 pl. 12, fig. 14. 1887a, p. 152. Muddy Creek.

cudmorei Notocallista (Striacallista) — *Notocallista (Striacallista)*
Marwick 1938, p. 72, pl. 13, fig. 1, 2. Lower bed, Table Cape.

cuneata Jouannetia — *Jouannetia*
Tate 1887a, p. 183, pl. 17, fig. 2. Adelaide Bore, Kent Town.

curta Mytilicardia — *Glans*
Tate 1886b, p. 150, pl. 2, fig. 9. Adelaide Bore, Kent Town.

cymbula Anomia — *Monia*
Tate 1886b, p. 101, pl. 9, fig. 5. Turritella clays, Blanche Point, Aldinga Bay.

decurrens Glycymeris — *Tucetona*
Chapman and Singleton 1925, p. 42, pl. 3, fig. 24-25, pl. 4, fig. 16. Forsyth's Grange Burn.

deformis Pecten = *Hinnites tatei* Cossmann 1907
Tate 1887a, p. 185, pl. 18, fig. 4, non Gabb 1864. Upper beds Muddy Creek.

delicatula Cardita — *Glans*

Tate 1886b, p. 154, pl. 2, fig. 10. River Murray cliffs near Morgan.

deltoides Eucrassatella — *Eucrassatella*

Darragh 1965a, p. 107, pl. 13, fig. 15, 17; pl. 15, fig. 30-31. ½ mile N. Dutchman Lime Quarry, Flinders Is.

dennanti Antigona — *Chioneryx*

Chapman & Crespin 1928, p. 104, pl. 6, fig. 26 a, b, pl. 12, fig. 82. Jemmy's Point, Gippsland.

dennanti Cardita — *Glans*

Tate and Basedow in Basedow 1902, p. 132, pl. 2, fig. 4. Edithburgh.

dennanti Chlamys asperrimus — *Chlamys*

Gatliff and Singleton 1930, p. 73, pl. 3, fig. 8-9; pl. 4, fig. 13 a-b. Glenelg River above Limestone Creek.

dennanti Crassatella — *Crassatella*

Tate 1886b, p. 146, pl. 11, fig. 2. Lower beds, Muddy Creek.

dennanti Miltha flindersiana — *Miltha*

Wilkins 1962, p. 43, pl. 5, fig. 3, 4. Bellevue, Mitchell River.

dennanti Plicatula — *Plicatula*

Chapman 1922, p. 6, pl. 1, fig. 6, 7. Lower beds, Muddy Creek.

dennanti Solecurtus — *Solecurtus*

Tate 1887a, p. 181, pl. 16, fig. 17. Lower beds, Muddy Creek.

dennanti Venericardia spinulosa = *Glans kelimnae* Crespin 1959

Chapman and Crespin 1933, p. 68, pl. 5, fig. 5, 6, non *Glans dennanti* (Tate & Basedow 1902).

Old Bunga Road, East of No. 1 Bore, Lakes Entrance.

densilineata Dosinia — *Kereia*

Pritchard 1896, p. 135, pl. 4, fig. 5-7. Lower beds, Spring Creek.

deperditus Mytilus — *Mytilus*

Tate 1887a, p. 187, pl. 19, fig. 1. Upper beds, Muddy Creek.

depressa Limopsis beaumariensis — *Limopsis*

Chapman 1911, p. 424. McDonalds, Muddy Creek.

depressa Donax — *Plebidonax*

Tate 1887a, p. 168, pl. 16, fig. 11. Oyster beds, Nor'west Bend, River Murray.

depressulata Venericardia — *Glans*

Chapman and Crespin 1933, p. 67, pl. 5, fig. 3. Parish of Coongulmerang 300-334 ft.

despectans Lucina — *Epicodakia*

Tate 1887a, p. 144, pl. 20, fig. 15-16. Lower beds, Muddy Creek.

detrita Pseudoarcopagia — *Pseudoarcopagia*

Woods 1931, p. 149, pl. 7, fig. 9. Abattoirs Bore, Adelaide.

dichotomalis Pecten — *?*

Tate 1886b, p. 106, pl. 9, fig. 3 a-c. Mornington.

dictua Chione — *Tawera*

Tate 1887a, p. 158, pl. 16, fig. 2. Oyster Beds, River Murray, Nor'west Bend.

excrescens Cardita — *Venericardia*
Pritchard 1903a, p. 98, pl. 12. fig. 2-3. Lake Bullen Merri, Camperdown.

exigua Notocallista (Fossacallista) — *Fossacallista*
Marwick, 1938, p. 77, pl. 13, fig. 10-11. Lower beds. Aldinga.

eyrei Pecten — *Chlamys*
Tate 1886b, p. 107, pl. 8, fig. 3 a-b, 6. Lower beds. Aldinga.

fabaeformis Lithophaga — *Lithophaga*
Crespin 1926, p. 118, pl. 9, fig. 14, 15. Green Gully, Keilor.

fabuloides Lucina — *Myrtea*
Tate 1886b, p. 158, pl. 12, fig. 5; 1887a, p. 145. Oyster banks, Blanche Point, Aldinga Bay.

fenestralis Nucula — *Pronucula*
Tate 1886b, p. 129, pl. 4, fig. 4. Table Cape.

fenestratus Septifer — *?*
Tate 1886b, p. 124, pl. 9, fig. 1. Muddy Creek; Corio Bay; Mornington.

flindersi Pecten — *Chlamys*
Tate 1886b, p. 108, pl. 8, fig. 7. Lower beds, Aldinga.

flindersiana Miltha (Milthoidea) grandis — *Miltha*
Singleton and Woods 1934, p. 210, pl. 8, fig. 4. Between 55 and 80 ft. No. 1 Bore, Wingaroo, Flinders Is.

fontinalis Leda — *Saccella*
Pritchard 1901, p. 28, pl. 3, fig. 3, 3a. Lower beds, Bird Rock Bluff.

foulcheri Pecten — *Chlamys*
Tenison Woods 1867, p. 1, pl. 1, fig. 3. Mount Gambier.

fragilis Capistrocardia — *Capistrocardia*
Type species of genus
Tate 1887a, p. 180, pl. 19, fig. 14, a-b. River Murray near Morgan.

fragilis Zenatiopsis — *Zenatiopsis*
Pritchard 1896, p. 139, pl. 4, fig. 3, 4. Upper bed, Table Cape.

gabrieli Myodora — *Myadora*
Chapman and Crespin 1928, p. 100, pl. 4, fig. 18 a-d. 670 ft. Sorrento Bore.

gaderopoides Spondylus — *Spondylus*
McCoy 1876b, p. 27, pl. 38, fig. 1-1d. Ad 23, Bird Rock bluff, Torquay.

gambierensis Pecten — *Chlamys*
Tenison Woods 1867, p. 1, pl. 1, fig. 2. Mount Gambier; Mosquito Plains.

gibberula Meroe — *Sunameroe*
Tate 1887a, p. 162, pl. 15, fig. 4 a-b. Upper beds, Muddy Creek.

gigantea Glycimeris australis — *Anodontia sphaericula*
Chapman 1915, p. 49, Chapman & Singleton 1925, p. 47, pl. 3, fig. 32. Vivonne Bay, Kangaroo Is.

gippslandica Venericardia — *Arcturellina*
Chapman and Crespin 1933, p. 67, pl. 5, fig. 4. Princes Highway E. of Bunga.

gippslandicum Trachycardium (Ovicardium) — *Trachycardium*
Crespin 1950, p. 154, pl. 15, fig. 3-4. 50-100 ft. Lakes Entrance Oil Shaft.

dimorphophylla Chione (Timoclea) *Proxichione*
Tate 1885b, p. 230. 1887a, p. 155, pl. 15, fig. 3 a-b. Murray River near Morgan.

dissimilis Barbatia *Trigonodesma*
Tate 1886b, p. 140, pl. 11, fig. 4, 5. Adelaide Bore, Kent Town.

dissimilis Dimya *Dimyodon*
Tate 1886b, p. 100. pl. 3, fig. 9 a-c. Lower beds, Muddy Creek.

dissimulina Arca (Barbatia)
Chapman and Crespin 1928, p. 98, pl. 3, fig. 13 a-b. 670 ft. Sorrento Bore.

dixoni Donax *Deltachion*
Tate 1887a, p. 168, pl. 16, fig. 15. Lower beds, Muddy Creek.

dolabraeformis Anatina *?*
Tate 1894, p. 188, pl. 12, fig. 3. Belmont.

dorsennata Eucrassatella *Eucrassatella*
Darragh 1965a, p. 103, pl. 13, fig. 18; pl. 14, fig. 27-29. Mississippi Creek.

eburnea Cytherea *Fossacallista*
Tate 1887a, p. 160, pl. 18, fig. 7. River Murray near Morgan.

edithburgensis Dosinia (Phacosoma) *Phacosoma*
Ludbrook 1959b, p. 228, pl. 3, fig. 4. Edithburgh, Pliocene.

elegantula Martesia *Pholas*
Tate 1898b, p. 409, pl. 20, fig. 7 a-b. Grange Burn.

ellipticus Solecurtus = *Solecurtus murrayvianus* Finlay 1927
Tate 1887a, p. 182 pl. 16, fig. 14, non Dana 1849. River Murray cliffs near Morgan.

entypoma Divalucina *Divalucina*
Cotton 1947, p. 663, pl. 20, fig. 9-10. Abbattoirs Bore, Adelaide.

ephamilla Corbula *Notocorbula*
Tate 1885b, p. 229. 1887a, p. 176, pl. 17, fig. 13 a-b; 14. River Murray cliffs near Morgan.

epitheca Barbatia *Barbatia*
Cotton 1947, p. 657, pl. 20, fig. 14, 17. Abattoirs Bore, Adelaide.

equidens Arca *Cucullaea*
Tate 1886b, p. 139, pl. 11, fig. 9. Adelaide bore, Kent Town.

equivalvis Corbula = *Corbula adelaidensis* Ludbrook 1955.
Woods 1931, p. 150, pl. 8, fig. 8-9. non Phillippi 1936. Abattoirs Bore, Adelaide.

etheridgei Chione *Proxichione*
Pritchard 1903a, p. 99, pl. 12, fig. 1. Lower beds, Bird Rock Bluff.

eupontica Eucrassatella *Eucrassatella*
Darragh 1965a, p. 101, pl. 13, fig. 13-14, 16; pl. 15, fig. 32. Beaumaris.

excavata Verticordia *Verticordia*
Pritchard 1901, p. 30. Cement works, Balcombe Bay.

glenelgensis Ostrea sinuata — *Ostrea*
Singleton 1941 p. 426, pl. 20, fig. 6. Allotment 16a. Parish of Werrikoo, Glenelg River.

globularis Crenella — *Exosiperna*
Tate 1886b, p. 126, pl. 10, fig. 3 a-b. Adelaide Bore, Kent Town.

gracilicostata Cardita — *Glans*
Tenison Woods 1877, p. 112. Table Cape.

grandis Dosinia — = *Milthoidea hora* Cotton 1941
Woods 1931, p. 148, pl. 7, fig. 5, 6. non Nelson 1870. Abattoirs Bore, Adelaide.

granosa Trigonia semiundulata — *Eotrigonia*
Pritchard 1903a, p. 92, pl. 15, fig. 5. Lower beds, Bird Rock bluff.

granti Glycymeris (Grandaxinaea) — *Grandaxinea*
Singleton 1932, p. 294, pl. 24, fig. 10-11. Lower beds, Muddy Creek.

gricei Nucula (Ennucula) — *Ennucula*
Singleton 1941, p. 423, pl. 20, fig. 1 a-b. Grice Creek.

gunyoungensis Glycymeris — *Tucetona*
Chapman and Singleton 1925, p. 23, pl. 1, fig. 5 a-b, 6; pl. 4, fig. 4. Grice Creek.

gunyoungensis Lucina — *?*
Pritchard 1903a, p. 98, pl. 14, fig. 13. Grice Creek.

halli Chione
Pritchard 1895, p. 229, pl. 12, fig. 10-12. Spring Creek near Geelong.

halli Glycimeris — *Glycymeris*
Pritchard 1903a, p. 89, pl. 15, fig. 1-2, 8 Forsyth's or Macdonald's Bank, Hamilton.

hamiltonensis Mactra — *Mactra*
Tate 1887a, p. 171, pl. 17, fig. 4 a-b. Upper beds, Muddy Creek.

hamiltonensis Mytilus — *Trichomya*
Tate 1887a, p. 186, pl. 18, fig. 9. Upper beds, Muddy Creek.

hamiltonensis Psammobia — *Gari*
Tate 1885a, p. 4. 1887a, p. 167, pl. 16, fig. 13. Upper beds, Muddy Creek.

hamptonensis Miltha — *Miltha*
Ludbrook 1969, p. 60, pl. 3, fig. 1-3; pl. 4, fig. 1-2. Hampton Microwave Repeater Tower, 33 miles E. of Madura, W.A.

harrisi Diplodonta — *Diplodonta*
Chapman 1922, p. 8, pl. 2, fig. 12. Bird Rock cliffs.

hemimeris Cardium — *Pratulum*
Tate 1887a, p. 153, pl. 14, fig. 2 a-c. Adelaide Bore, Kent Town.

hindmarshensis Cyclocardia (Arcturellina) — *Arcturellina*
Ludbrook 1955, p. 44, pl. 2, fig. 9. Hindmarsh Bore 450-487 ft Adelaide.

hindmarshensis Myllita — *Myllita*
Ludbrook 1955, p. 57, pl. 3, fig. 12. Hindmarsh Bore 450-487 ft. Adelaide.

hippopus Ostrea — *Ostrea*
Tate 1886b, p. 98, pl. 4, fig. 1 a-b. non Lamarck 1818. Lower beds, Aldinga.

hora Milthoidea — *Miltha*
nom. nov. for *Dosinia grandis* Woods 1931 non Nelson 1870. Cotton 1941, p. 663.

hormophora Chione (Timoclea) — *Proxichione*
Tate 1885b, p. 230. 1887a, p. 155, pl. 15, fig. 1a, b. Table Cape.

howchiniana Mactra — *Electomactra*
Tate 1887a, p. 171, pl. 17, fig. 3a, b. Lower beds, Muddy Creek.

howitti Trigonia — *Neotrigonia*
McCoy 1875a, p. 316, pl. 18b. Jemmy's Point.

huttonii Leda — *Poroleda*
Tenison Woods 1879a, p. 239, pl. 21, fig. 2. Lower beds, Muddy Creek.

hyotidoidea Ostrea — *Lopha*
Tate 1899b, p. 268. (Tate 1886, p. 96, pl. 6, fig. 5.) River Murray Cliffs.

imparistriata Dosinia — *Dosinia*
Tate 1887a, p. 162, pl. 14, fig. 11. Adelaide Bore, Kent Town.

incertus Pecten — *Mesopeplum*
Tenison Woods 1867, p. 1, pl. 1, fig. 1. Type locality not stated.

incurvilamellata Tawera — *Tawera*
Ludbrook 1955, p. 68, pl. 3, fig. 18, 19. Abattoirs Bore, Adelaide.

interclathrata Anadara — *Anadara*
Ludbrook 1965, p. 102, pl. 4, fig. 8-10. Spring Creek, Torquay.

intermedius Glycimeris halli = *Glycimeris halli mistio* Finlay 1927b.
Pritchard 1903a, p. 90, pl. 14, fig. 10, 11. non Broderip 1832. Probably McDonald's Bank, Muddy Creek.

idonea Monitilora (Monitilora) — *Monitilora*
Ludbrook 1955, p. 47, pl. 3, fig. 1, 2. Hindmarsh Bore, 450-487 ft, Adelaide.

intersitans Trigonia — *Eotrigonia*
nom. nov. for *Trigonia tatei* Pritchard non Holub and Newmayr 1882. Tate in Tate and Dennant 1896, p. 146.

janjukiensis Atrina — *Atrina (Servatrina)*
Crespin 1950, p. 150, pl.17, fig. 18-20. 1048 ft Lakes Entrance Oil Shaft.

janjukiensis Venericardia — *Glans*
Chapman and Singleton 1927, p. 120, pl. 11, fig. 30 a-b 31. Bird Rock Cliffs, Torquay.

jeffreysiana Lima — *Limatula*
Tate1885b, p. 230. 1886b, p. 119, pl. 4, fig. 8. River Murray Cliffs.

johnstoni Dosinia — *Kereia*
Tate 1887a, p. 161, pl. 14, fig. 9, 12. Upper beds Muddy Creek.

kalimnae Mytilicardia — *Cardita*
Pritchard 1903a, p. 97, pl. 12, fig. 4. Jemmy Point, Kalimna.

kalimnae Nucula — *Ennucula*
Singleton 1932, p. 292, pl. 24, fig. 7-9. Jemmy Point.

kalimnensis Panope — *Panope*

Crespin 1950, p. 155, pl. 17, fig. 19, 20. 50 ft Lakes Entrance Oil Shaft.

keiloriana Chlamys — *Chlamys*

Crespin 1926, p. 118, pl. 8, fig. 13. Green Gully, Keilor.

kelimnae Glans — *Glans*

nom. nov. for *Venericardia spinulosa dennanti* Chapman and Crespin 1933 non *Glans dennanti (Tate & Basedow 1902)*

Crespin 1959, p. 1127.

kenyoniana Donax — *Plebidonax*

Chapman and Gabriel 1914, p. 312, pl. 27, fig. 19 a-b, 20-21. Mallee Bore 10, 310-320 ft.

killara Nuculana (Scaeoleda) — *Scaeoleda*

Singleton 1941, p. 424, pl. 20, fig. 2. Roscoe's, Glenelg River.

kingicoloides Crassatellites — *Eucrassatella*

Pritchard 1903a, p. 94, pl. 13, fig. 1-3. Jemmy Pt., Kalimna.

krauscana Semele — *Semele*

Tate 1887b, p. 169, pl. 16, fig. 18 a-b. Mornington.

krausei Tellina — Indeterminate

McCoy in Brough Smyth 1875, p. 22, fig. 3. Stawell.

laevigata Vulsella — *Vulsella*

Tate 1886b, p. 122, pl. 3, fig. 3 a-b. Base of Witton Bluff near mouth of R. Onkarparinga.

lamellata Gouldia — *Salaputium*

Tate 1886b, p. 148, pl. 2, fig. 17. Lower beds, Blanche Point, Aldinga; Adelaide Bore, Kent Town.

lamellata Myodora — *Myadora*

Tate 1887a, p. 175, pl. 17, fig. 6-7. Adelaide Bore, Kent Town.

lamellifera Chama — *Chama*

Tenison Woods 1877, p. 114. Table Cape.

lanceolata Poroleda — = *Poroleda tatei* Hedley 1904

Tate 1894, p. 186, pl. 12, fig. 6, 6a, non Hutton 1893. Gellibrand River.

latecaudatus Lithophagus — *Modiolus*

Pritchard 1903a, p. 88, pl. 14, fig. 4. Lower beds, Bird Rock bluff.

latesulcata Neaera (Rhinomya) — *Cuspidaria*

Tate 1887a, p. 178, pl. 19, fig. 7. Adelaide bore, Kent Town.

latissima Cardita — *Glans*

Tate 1886b, p. 153, pl. 2, fig. 5. Adelaide Bore; Blanche Point, Aldinga Bay.

legrandi Solecurtus — *Solecurtus*

Tenison Woods 1876, p. 25, pl., fig. 14. Ttate 1887a, p. 181, pl. 17, fig. 15. Table Cape.

lenticularis Pectunculus — *Tucetona*

Tate 1886b, p. 138, pl. 11, fig. 1. Adelaide Bore, Kent Town.

leptorhyncha Leda — *Ledella*
Tate 1886b, p. 131, pl. 10, fig. 5 a-b. Lower beds Aldinga.

lindsayi Miltha — *Miltha*
Ludbrook 1969, p. 61, pl. 5, fig. 1-7. Jervois Punt, Tailem Bend, S.A.

leucomomorpha Lucina
Tate 1886b, p. 158, pl. 12, fig. 7. Tate 1887, p. 142. Muddy Creek.

limatella Barbatia — *Barbatia*
Tate 1886b, p. 141, pl. 10, fig. 2. Adelaide Bore, Kent Town.

linguatulus Mytilus — *Brachidontes*
Tate 1887a, p. 187, pl. 19, fig. 3. Upper beds, Muddy Creek.

linguliformis Lima — *Lima*
Tate 1886b, p. 118, pl. 3, fig. 1 a-b. Lower beds Muddy Creek.

liratum Aspergillum (Humphreyia) — *Clavagella*
Tate 1887a, p. 184, pl. 19, fig. 11. Adelaide Bore, Kent Town.

lubra Notostrea — *Notostrea*
Finlay in Marwick 1928, p. 432 (Tate 1886b, p. 98, pl. 6, fig. 2 a-b). Great Australian Bight.

lucens Pecten — *Amusium*
Tate 1886b, p. 115. Upper beds, Aldinga Bay.

lucida Leda — = *Leda vagans Tate 1887*
Tenison Woods 1879b, p. 3, pl. 1, fig. 5-5a. non Loven 1846. Lower beds, Muddy Creek.

lutea Notocallista (Striacallista) — *Striacallista*
Marwick 1938, p. 72, pl. 13, figs. 5-6. Lower beds, Muddy Creek.

lutosa Trigonia semiundulata — *Neotrigonia*
Pritchard 1903a, p. 92, pl. 15, fig. 6-7. Lower beds, Muddy Creek.

maccoyi Limopsis — *Limopsis*
Chapman 1911, p. 421, pl. 83, fig. 2. pl. 85, fig. 8. Grice Creek.

maccoyi Pectunculus — *Grandaxinea*
Johnston 1880, p. 41. Type lost, neotype. Chapman and Singleton 1925, p. 27, pl. 1, fig. 7 a-b; pl. 4, fig. 5. Table Cape.

macer Rochefortia — *Mysella*
Woods 1931, p. 147, pl. 7, fig. 3. Abattoirs Bore, Adelaide.

mactraeformis Cryptodon — *Cryptodon*
Tate 1887a, p. 146, pl. 19, fig. 5. Lower beds, Muddy Creek.

manubriata Ostrea — *Ostrea*
Tate 1887a, p. 184, pl. 19, fig. 10. Upper beds, Muddy Creek.

marthae Nucula — Indeterminate
McCoy in Brough Smyth 1875, p. 22, fig. 2. Stawell.

masoni Tellina — *Tellina*
Tate 1887a, p. 165, pl. 16, fig. 6 a-b. Lower beds, Muddy Creek.

maudensis Cardita — *Venericardia*
Pritchard 1895, p. 229, pl. 12, fig. 6-7. Lower beds, Maude.

maudensis Crassatellites *Spissatella*

Pritchard 1903a, p. 93, pl. 14, fig. 2, 3. Lower and middle beds, Bird Rock Bluff, Torquay.

maudensis Glycymeris *Tucetilla*

Chapman & Singleton 1925, p. 35, pl. 2, fig. 13 a-b; pl. 4, fig. 9, Lower beds, Maude.

mediosulcatum Cardium *Fulvia*

Tate & Basedow in Basedow 1902, p. 131, pl. 2, fig. 3. Edithburg.

memanae Eucrassatella *Eucrassatella*

Darragh 1965a, p. 108, pl. 12, fig. 2-3; pl. 13, fig. 19-20. Memana dragline drain, Flinders Island.

meringae Pecten *Mesopeplum*

Tate 1899b, p. 271, Gippsland Lakes.

micans Kellia *Properycina*

Tate 1887a, p. 148, pl. 19, fig. 13. Muddy Creek.

microundula Arca (Barbatia) *?*

Chapman & Crespin 1928, p. 98, pl. 3, fig. 12, a-b. 623 ft Sorrento Bore.

minuta Cucullea Preoccupied nomen dubium

Johnston 1880, p. 39. non J. de C. Sowerby 1824. Table Cape.

mistio Glycimeris halli *Glycymeris halli*

nom. nov. for *Glycimeris halli* var. *intermedia* Pritchard 1903 non Broderip 1832 Finlay 1927b, p. 524.

mollesta Notocallista (Striacallista) *Striacallista*

Marwick 1938, p. 73, pl. 13, figs. 7-9. 400-500 ft Abattoirs Bore, Adelaide.

moniletectum Cardium *Hedecardium*

Tate 1887a, p. 151, pl. 14, fig. 3 a-b. Adelaide Bore, Kent Town.

moondarae Proxichione *Proxichione*

Darragh 1965b, p. 170, pl. 23, fig. 18-21. Moondara Farm, Bairnsdale.

mooraboolensis Modiolus *Modiolus*

Chapman 1922, p. 7, pl. 3, fig. 17. Maude.

mooraboolensis Mytilus *Hormomya*

Pritchard 1903a, p. 88, pl. 14, fig. 1. Lower beds, Bird Rock Bluff.

morningtonensis Limopsis *Limopsis*

Pritchard 1901, p. 24, pl. 2, fig. 6, 6a. Gellibrand River below Curdie's steps.

morundiana Nucula *Pronucula*

Tate 1886b, p. 128, pl. 4, fig. 2 a-b. Lower beds, Muddy Creek.

mulderi Hinnites *Hinnites*

Chapman 1922, p. 5, pl. 2, fig. 9-10. Batesford.

multilamella Carditella *Cuna*

Tate 1887a, p. 189, pl. 20, fig. 17. Lower beds, Muddy Creek.

multilamellata Chione *Dosina*

Tate 1887*a*, p. 154, pl. 15, fig. 6 a-b. Adelaide Bore, Kent Town.

multiradiata Limea *Limea*

Tate 1899b, p. 274. *Turritella* Marls, Aldinga Bay.

multiradiata Limopsis — *Limopsis*
Tate 1886b, p. 135, pl. 12, fig. 1 a-b. Adelaide Bore, Kent Town.

multistrigosa Katelysia — *Katelysia*
Chapman & Crespin 1928, p. 105, pl. 5, fig. 25. 605 ft Sorrento Bore.

murrayana Cardita — *Glans*
Tate 1886b, p. 151, pl. 2, fig. 2. Lower beds, Glenforslan, River Murray.

murrayana Cytherea — *Bassina*
Tate 1887a, p. 159, pl. 14, fig. 18. Oyster beds, River Murray, Nor-west Bend.

murrayanus Pecten — *Chlamys*
Tate 1886b, p. 105, pl. 7, fig. 5 a-b. Lower beds, River Murray Cliffs.

murrayvianus Solecurtus — *Solecurtus*
nom. nov. for *Solecurtus ellipticus* Tate 1887 non Dana 1849. Finlay 1927b, p. 531.

nasuta Avicula — *Pteria*
Tate 1886b, p. 121, pl. 11, fig. 11; pl. 12, fig. 12. Adelaide bore, Kent Town.

negata Arca — *Arca*
Cotton 1947, p. 656, pl. 20, fig. 11-12. 385-395 ft Bore 65 S.A. Dept. of Mines.

notabilior Gonimyrtea — *Gonimyrtea*
Ludbrook 1955, p. 53, pl. 3, fig. 7-8. Hindmarsh Bore 450-487 ft Adelaide.

novaguineana Neotrigonia — *Neotrigonia*
Skwarko 1968, p. 192, pl. 24, fig. 1-3. Mount Hagen /Sepik area, New Guinea.

nuciformis Lucina — *Bellucina*
Tate 1886b, p. 158, pl. 12, fig. 10. 1887a, p. 144. Oyster beds, Blanche Point, Aldinga Bay.

nullarborensis Miltha — *Miltha*
Ludbrook 1969, p. 61, pl. 4, fig. 3-6. 140-mile quarry, 6 miles SW. of Forrest, W.A.

oblonga Crassatella — *Eucrassatella*
Tenison Woods 1876, p. 25, fig. 11. Lower bed, Table Cape.

obolella Leda — *Ovaleda*
Tate 1886b, p. 129, pl. 5, fig. 3 a-b. Lower beds, Muddy Creek.

opima Notocallista (Fossacallista) — *Fossacallista*
Marwick 1938, p. 76, pl. 13, fig. 13-15. Balcombe Bay.

ornithopetra Glycymeris — *Grandaxinea*
Chapman and Singleton 1925, p. 32; pl. 2, fig. 9a, b; pl. 4, fig. 7. Bird Rock Cliffs.

ornithopetronica Protocardia — *Pratulum*
Chapman and Crespin 1928, p. 103, pl. 12, fig. 81. Bird Rock, Torquay.

palmipes Pecten — *Mesopeplum*
Tate 1886b, p. 105, pl. 5, fig. 4; pl. 7, fig. 4a, b. Edithburg.

paucicostatus Glycimeris halli — *Glycymeris*
Pritchard 1903a, p. 90, pl. 4, fig. 12; pl. 15, fig. 9. Jemmy Point, Kalimna.

paucigradata Nuculana — *Nuculana*
Singleton 1943, p. 268, pl. 12, fig. 1 a-b. Second point NW. of Pebble Point.

polyactina Lima *Lima*
Tate 1886b, p. 118, pl. 8, fig. 4 a-c. Adelaide Bore, Adelaide.

polyaktinos Chlamys (Chlamys) *Chlamys*
Ludbrook 1955, p. 30, pl. 4, fig. 16. Abattoirs Bore, Adelaide.

polynema Cardita *Glans*
Tate 1886b, p. 153, pl. 2, fig. 7. Mornington.

polynema Lima *Promantellum*
Tate 1886b, p. 119, pl. 10, fig. 9. Adelaide Bore, Kent Town.

porrecta Tellina *Semelangulus*
Tate 1887a, p. 165, pl. 16, fig. 8. Adelaide Bore, Kent Town.

praecursor Pecten = *Notochlamys antecedans* Singleton 1941
Chapman 1912a, p. 36, pl. 5, fig. 1-3. non Dall 1898. Spring Creek, Torquay.

praecygnorum Vasticardium (Regozara) *Regozara*
Ludbrook 1955, p. 61, pl. 4, fig. 12. Dry Creek Bore, Adelaide.

praelonga Cucullaea corioensis *Cucullaea*
Singleton 1932, p. 303, pl. 26, fig. 20. Forsyth's Grange Burn.

praelonga Leda *Ledella*
Tate 1886b, p. 132, pl. 12, fig. 4 a-b. Lower beds, Muddy Creek.

praelonga Myodora *Myadora*
Tate 1887a, p. 173, pl. 19, fig. 12 a-d. Upper beds, Muddy Creek.

praenuntia Philobrya *Cosa*
Tate 1898d, p. 88, pl. 4, fig. 9. Cape Otway.

praerupta Modiola *Modiolus*
Pritchard 1901, p. 25, pl. 2, fig. 3-4. Cement Works, Balcombe Bay.

projecta Lucina *?*
Tate 1886b, p. 158, pl. 12, fig. 6. 1887a, p. 143. Lower beds, Muddy Creek.

propinqua Chione *Tawera*
Tenison Woods 1877, p. 113. Table Cape.

proterothetidis Nemocardium (Pratulum) *Pratulum*
Ludbrook 1955, p. 64, pl. 3, fig. 16, 17. Abattoirs Bore, Adelaide.

protomarica Glycydonta *Veremolpa*
Cotton 1936, p. 504, fig. 1. 49 ft Torrensville Bore, Adelaide.

psephea Cucullaea (Cucullona) *Cucullona*
Singleton 1943, p. 270, pl. 13, fig. 7 a-b; 8 a-b. Second point NW. of Pebble Point.

pseudaustralis Glycymeris (Veletuceta) *Glycymeris*
Singleton 1941, p. 425, pl. 20, fig. 4-5. Roscoe's, Glenelg River.

pseudomagnum Cardium *Trachycardium*
McCoy 1877, p. 15, pl. 44, fig. 1. Ad 22, Bird Rock Bluff.

pseudonavicularis Arca *Arca*
Tate 1886b, p. 139, pl. 11, fig. 8. Adelaide Bore, Kent Town.

pseudoradula Spondylus *Spondylus*
McCoy 1877, p. 17, pl. 45, fig. 2. Ad 28, Fyansford.

paucirugata Cytherea — *Bassina*
Tate 1887a, p. 158, pl. 14, fig. 14. Upper beds, Muddy Creek.

paupertina Venerupis — *Venerupis*
Tate 1887a, p. 162, pl. 14, fig. 15. Upper beds, Muddy Creek.

pecten Cardita — *Pleuromeris*
Tate 1886b, p. 151, pl. 2, fig. 11. Upper beds, Muddy Creek.

pectinata Verticordia — *Verticordia*
Tate 1887a, p. 150, pl. 14, fig. 13. Lower beds, Muddy Creek.

percrassa Melina — *Isognomen*
Tate 1899b, p. 276. 'Junction bed of the Miocene' at Grange Burn.

peridonea Cyclocardia (Arcturellina) — *Arcturellina*
Ludbrook 1955, p. 44, pl. 2, fig. 7. Hindmarsh Bore, 450-487 ft, Adelaide.

pernitida Antigona — *Tawera*
Woods 1931, p. 148, pl. 8, fig. 1-2. Abattoirs Bore, Adelaide.

peroni Pecten — *Chlamys*
Tate 1886b, p. 108, pl. 10, fig. 1 a-b. Lower beds, Aldinga.

perornatum Gafrarium — *Gafrarium*
Woods 1931, p. 148, pl. 7, fig. 7-8. Abattoirs Bore, Adelaide.

perscabrosa Thracia — *Eximiothracia*
Tate 1887a, p. 172, pl. 15, fig. 5. Lower beds, Muddy Creek.

pestis Notocallista (Striacallista) — *Striacallista*
Marwick 1938, p. 73, pl. 13, fig. 3-4. 400-500 ft Abattoirs Bore, Adelaide.

phorca Zenatiopsis — *Zenatiopsis*
Gill & Darragh 1963, p. 183, pl. 28, fig. 3-4; pl. 29, fig. 2, 5-6; pl. 30, fig. 4, 7-8. MacDonald's Bank, Muddy Creek.

pixidata Corbula — *Notocorbula*
Tate 1887a, p. 177; pl. 17, fig. 12 a-b. Lower beds, Aldinga.

plana Myochama — *Myochama*
Tate 1894, p. 190, pl. 12, fig. 4. Reeves River, Gippsland Lakes; Dry Creek Bore, Adelaide.

planatella Lucina — *Codokia*
Tate 1885b, p. 229, 1886b, p. 158, pl. 12, fig. 11. Table Cape.

planiuscula Glycymeris — *Melaxinaea*
Chapman & Singleton 1925, p. 43; pl. 3, fig. 26-28; pl. 4, fig. 17, 18. Glenelg River.

planiuscula Leda — *Ovaleda.*
Tate 1886b, p. 130, pl. 5, fig. 2. Adelaide Bore, Kent Town.

planiusculum Lepton — *Lepton*
Tate 1879, p. 130, pl. 5, fig. 12. Upper beds, Aldinga.

platycostata Mytilicardia — *Cardita*
Johnston 1880, p. 40, Table Cape.

polita Carditella — *Cuna*
Tate 1887a, p. 188, pl. 20, fig. 20-21. Muddy Creek.

pueblensis Modiola — *Modiolus*
Pritchard 1901, p. 26, pl. 3, fig. 1. Lower beds, Bird Rock Bluff.

pumila Barbatia — *Barbatia*
Tate 1886b, p. 142, pl. 10, fig. 7. Upper beds, Muddy Creek.

radiata Micromeris — *Cuna*
Tate 1886b, p. 148, pl. 10, fig. 12. Lower beds, Blanche Point, Aldinga Bay; Adelaide Bore, Kent Town.

ralphi Panope — *Panope*
Finlay 1927a, p. 473 (Tate 1887, pl. 18, fig. 3) River Murray cliffs.

ralphi Tellina — *Macoma*
nom. nov. for *Tellina aequilatera* Tate 1887 non Koch & Dunbar 1837. Finlay 1927b, p. 530.

ramulosa Plicatula — *Plicatula*
Tate 1898a, p. 408. Table Cape.

regularis Carditella — *Carditellona*
Pritchard 1901, p. 28, pl. 2, fig. 5. Grice Creek.

reticosa Pinna — *Streptopinna*
Chapman 1912b, p. 47, pl. 6, fig. 8. Seal River, King Isl.

rhomboidea Nuculana — *Ledella*
May 1922, p. 12, pl. 4, fig. 9. Table Cape.

rhomboidea Verticordia — *Verticordia*
Tate 1887a, p. 149, pl. 14, fig. 4. River Murray near Morgan.

rosicollina Eucrassatella — *Eucrassatella*
Darragh 1965a, p. 102, pl. 12, fig. 5-7. Moondara Farm.

rota Tucetilla — *Tucetilla*
Cotton 1947, p. 659, pl. 20, fig. 3-4. Abattoirs Bore, Adelaide.

rugata Myochama — *Myochama*
Tate 1894, p. 190, pl. 12, fig. 5. Gellibrand River; Spring Creek.

rugosa Micromeris — *Cuna*
Tate 1886b, p. 148, pl. 10, fig. 11. Adelaide Bore, Kent Town.

salebrosa Codakia — *Gibbolucina*
Woods 1931, p. 149, pl. 8, fig. 4-5. Abattoirs Bore, Adelaide.

salisburyensis Gonimyrtea — *Gonimyrtea*
Ludbrook 1955, p. 50, pl. 2, fig. 12. Abattoirs Bore, Adelaide.

scabrosa Cardita — *Glans*
Tate 1886b, p. 152, pl. 2, fig. 4. River Murray cliffs near Morgan.

sella Placunanomia — *Pododesmus*
Tate 1886b, p. 102, pl. 5, fig. 1 a-c. Lower beds, River Murray cliffs.

semicostata Pinna — = *Atrina tateana* Hedley 1924
Tate 1886b, p. 122, pl. 12, fig. 9. non Conrad 1837. Oyster banks, Adelaide.

semigranosa Modiolaria — *Lanistina*
Tate 1886b, p. 125, pl. 3, fig. 5. Adelaide Bore, Kent Town.

semilaevis Pecten yahlensis — *Serripecten*
McCoy 1876b, p. 13, pl. 34. Bairnsdale.

semistriata Nucula — See *Nucula tatei* Finlay 1924
Tate 1886b, p. 128, pl. 4, fig. 5a, b. non Wood 1840. Lower beds, Aldinga.

semiundulata Trigonia — *Eotrigonia*
Type species of genus
Jenkins 1865, p. 630, fig. 6.

semiundulata Trigonia — See previous entry
McCoy 1866b, p. 481. Bird Rock Bluff, Torquay.

septuagenarium Cardium — *Hedicardium*
Tate 1887a, p. 151, Nor'west Bend; Nine mile camp; Table Cape.

sericea Montacuta — *?*
Tate 1887a, p. 148, pl. 14, fig. 6. Upper beds, Muddy Creek.

shelfordensis Clausinella — *Callanaitis*
Chapman & Crespin 1928, p. 105, pl. 6, fig. 27. Shelford.

sigillata Dimya — *Dimyodon*
Tate 1886b, p. 100, pl. 8, fig. 8 a-b, Aldinga; Adelaide Bore; Great Australian Bight.

simulans Barbatia — *Acar*
Tate 1886b, p. 142, pl. 11, fig. 10. Lower beds, Muddy Creek.

simulans Loripes — *Wallucina*
Tate 1887a, p. 146, pl. 14, fig. 19. Upper beds, Aldinga.

singletoni Notocallista (Fossacallista) — *Fossacallista*
Marwick 1938, p. 78, pl. 14, figs. 15-16. Upper bed, Table Cape.

singularis Modiolaria — *Solamen*
Tate 1886b, p. 125, pl. 3, fig. 7. Muddy Creek.

sinuatum Cryptodon — *Thyasira*
Woods 1931, p. 149, pl. 8, fig. 6. Abattoirs Bore, Adelaide.

solida Cardita — *Arcturellina*
Tate 1887a, p. 189, pl. 20, fig. 18. Upper beds, Muddy Creek.

solitaria Diplodonta — *Diplodonta*
Woods 1931, p. 149, pl. 8, fig. 3. Abattoirs Bore, Adelaide.

sordidus Solen — *Solen*
Tate 1887a, p. 180, pl. 19, fig. 2. Upper beds, Muddy Creek.

sorrentae Cardita — *Cardita*
Chapman and Crespin 1928, p. 101, pl. 11, fig. 77-78. 623 ft Sorrento Bore.

sphericula Meretrix — *Anodontia*
Basedow 1902, p. 131, pl. 2, fig. 2. Edithburg.

spinulosa Cardita — *Glans*
Tate 1886b, p. 153, pl. 2, fig. 3. Mornington.

spondyloides Pecten — *Spondylus*
Tate 1882, p. 44. 1886b, p. 112, pl. 4, fig. 6, 7. Upper beds, Aldinga.

subrostrata Neaera *Cuspidaria*
Tate 1887a, p. 177, pl. 15, fig. 2 a-b. Lower bed, Muddy Creek.

subtilicostata Proxichione *Proxichione*
Darragh 1965b, p. 169, pl. 21, fig. 4-7. Clifton Bank, Muddy Creek.

subtrigonalis Pectunculus *Tucetona*
Tate 1886b, p. 137, pl. 11, fig. 6 a-b. Lower beds, River Murray near Morgan.

tasmanica Cardita *Glans*
Tate 1886b, p. 154, pl. 12, fig. 13. Table Cape.

tateana Atrina *Atrina (Servatrina)*
nom. nov. for *Pinna semicostata* Tate 1886 non Conrad 1837, Hedley 1924 p. 143.

tatei Anomia *Pododesmus*
Chapman & Singleton in Chapman & Crespin 1928, p. 99, pl. 11, fig. 76 a-b. Grange Burn.

tatei Crassatella See *Crassatella communis* Tate 1896
nom. nov. for *Crassatella astartiformis* Tate 1885 non Nyst 1843 (= *Crassatella communis* Harris 1897)
Cossmann 1913, p. 64.

tatei Cytherea *Notocallista (Fossacallista)*
nom. nov. for *Cytherea tenuis* Tate 1887 non Hall & Meek 1854.
Cossmann 1920, p. 37.

tatei Hinnites *Hinnites corioensis*
nom. nov. for *Pecten deformis* Tate 1887 non Gabb 1864.
Cossmann 1907, p. 201.

tatei Nucula *Pronucula*
nom. nov. for *Nucula semistriata* Tate 1886 non Wood 1840.
Finlay 1924, p. 107.

tatei Poroleda *Lamellileda*
nom. nov. for *Poroleda lanceolata* Tate 1894 non Hutton 1893.
Hedley 1904, p. 112.

tatei Trigonia = *Trigonia intersitans* Tate 1896
Pritchard 1895, p. 225, pl. 12, fig. 1, 2, 3. non Holub & Neumayr 1882. Lower beds, Maude.

tellinoides Rochefortia *Mysella*
Woods 1931, p. 148, pl. 7, fig. 4. Abattoirs Bore, Adelaide.

tenisoni Nucula *Ennucula*
nom. nov. for *Nucula tumida* Tenison Woods 1877 non Phillips 1836. Pritchard 1896, p. 128. Table Cape.

tenuicostae Condylocardia *Condylocardia*
Chapman & Gabriel 1914, p. 309, pl. 27, fig. 17 a-c. Mallee Bore 10, 310-320 ft.

tenuilirata Myodora *Myadora*
Tate 1887a, p. 174, pl. 17, fig. 9 a, b. Lower beds, Muddy Creek.

stirlingi Tellina — *Homalina*
Tate 1887a, p. 166, pl. 16, fig. 7 a-b. Lower beds, Muddy Creek.

sturtiana Ostrea — *Ostrea*
Tate 1886b, p. 97, pl. 6, fig. 1. Upper beds, River Murray Cliffs, Overland Corner.

sturtianus Pecten — *Chlamys*
Tate 1886b, p. 109, pl. 7, fig. 2 a-c. Lower beds, River Murray Cliffs, Blanchetown.

subbifrons Pecten — *Equichlamys*
Tate 1882, p. 44; 1886b, p. 104, pl. 3, fig. 2. Government House Quarry, Adelaide.

subcompacta Venericardia — *Scalaricardita*
Chapman & Crespin 1928, p. 102, pl. 5, fig. 21; pl. 11, fig. 80. 605 ft Sorrento Bore.

subconvexus Pecten — *Chlamys*
Tate 1887a, p. 185, pl. 18, fig. 2. Upper beds, Muddy Creek.

subdeceptiva Cardita — *Cardita*
Ludbrook 1955, p. 40, pl. 4, fig. 14. Dry Creek Bore, Adelaide.

suberosa Aulacomya — *Hormomya*
Singleton 1941, p. 427, pl. 20, fig. 7. Limestone Creek, Glenelg River.

subfenestratus Septifer
Basedow 1904, p. 251, text fig. Vale Royal Vineyards, Happy Valley, S.A.

submaculosum Vasticardium (Vasticardium) — *Vasticardium*
Ludbrook 1955, p. 60, pl. 4, fig. 18. Weymouth's Bore 310-330 ft, Adelaide.

submenkeanus Mytilus — *Brachydontes*
Tate 1886b, p. 124; Ludbrook 1955, p. 80, pl. 6, fig. 12. Hallet's Cove.

submultistriata Cytherea — *Notocallista (Striacallista)*
Tate 1887a, p. 160, pl. 18, fig. 6, 8. Upper beds, Muddy Creek.

subnodulosa Lima (Limatula) — *Limatula*
Tate 1899b, p. 273. Upper beds, Muddy Creek.

suborbicularis Sacchia — *Numella*
Tate 1887a, p. 147, pl. 18, fig. 10 a-c. Oyster beds, Nor'west Bend, River Murray.

subpecten Pleuromeris — *Pleuromeris*
Ludbrook 1955, p. 42, pl. 2, fig. 3. Weymouth's Bore 310-330 ft, Adelaide.

subquadrata Diplodonta = *Diplodonta balcombensis* Pritchard 1906
Tate 1887a, p. 147, pl. 14, fig. 10 a-b. non Carpenter 1855. Lower beds, Muddy Creek.

subradians Glycimeris — *Tucetilla*
Tate in Basedow 1902, p. 132. Hallets Cove; or Edithburg.

subrectangularis Solecurtus — *Solecurtus*
Woods 1931, p. 149, pl. 8, fig. 7. Abattoirs Bore, Adelaide.

subroborata Chione — *Placamen*
Tate 1887a, p. 156, pl. 14, fig. 17. Upper beds, Muddy Creek.

tenuis Cytherea = *Cythera tatei* Cossmann 1920
Tate 1887a, p. 159, pl. 14, fig. 16, non Hall & Meek 1854. Adelaide Bore, Adelaide.

tiara Barnea *Pholas*
Tate 1887a, p. 182, pl. 18, fig. 1 a-c. Upper beds, Muddy Creek.

torrensensis Properycina *Properycina*
Ludbrook 1955, p. 58, pl. 3, fig. 13. Hindmarsh Bore 450-487 ft, Adelaide.

transenna Limea *Limea*
Tate 1886b, p. 119, pl. 9, fig. 6 a-b. Lower beds, Muddy Creek.

trapezia Myochama *Myochama*
Pritchard 1895, p. 227, pl. 12, fig. 8-9. Curlewis.

trigonalis Cardita *Pleuromeris*
Tate 1886b, p. 151, pl. 2, fig. 1. Oyster Banks, Blanche Point, Aldinga Bay.

trua Neotrigonia *Neotrigonia*
Cotton 1947, p. 661, pl. 20, fig. 5-6. Abattoirs Bore, Adelaide.

tubulifera Trigonia *Eotrigonia*
Tate 1885a, p. 3. Tate 1886b, p. 145, pl. 11, fig. 13 a, b. Lower beds, Muddy Creek.

tumida Nucula = *Nucula tenisoni* Pritchard 1896
Tenison Woods 1877, p. 111, non Phillips 1836. Table Cape.

vagans Leda *Saccella*
nom. nov. for *Leda lucida* Tenison Woods non Loven 1846.
Tate 1887a, p. 188.

valida Limopsis chapmani *Limopsis*
Singleton 1932, p. 299. pl. 25, fig. 17. Birregurra.

validior Gonimyrtea *Gonimyrtea*
Ludbrook 1955, p. 52, pl. 3, fig. 5-6. Hindmarsh Bore 450-487 ft, Adelaide.

variabilis Anapa *Anapella*
Tate 1887a, p. 172, pl. 17, fig. 5 a-b. Upper beds, Aldinga.

vellicata Cuspidaria *Cuspidaria*
Chapman & Crespin 1928, p. 101, pl. 5, fig. 20. 605 ft Sorrento Bore.

venusta Nucula *Ennucula*
Woods 1931, p. 147, pl. 7, fig. 1-2. Abattoirs Bore, Adelaide.

vesiculosa Semele *Semele*
Tate 1887a, p. 169, pl. 16, fig. 12. Lower beds, Muddy Creek.

victoriae Cardium *Pratulum*
Tate 1887a, p. 151, pl. 14, fig. 1 a-b. Lower beds, Muddy Creek.

victoriensis Lentipecten *Lentipecten*
Crespin 1950, p. 151, pl. 15, fig. 8-11. 1020-1060 ft Lakes Entrance Oil Shaft.

werrikooensis Limopsis *Limopsis*
Singleton 1941, p. 425, pl. 20, fig. 3 a-b. Limestone Creek, Glenelg River.

woodsii Leda *Scaeoleda*
Tate 1886b, p. 133, pl. 9, fig. 8. Lower beds, Muddy Creek.

yahliensis Pecten *Serripecten*
Tenison Woods 1867, pl 1, pl. 1, fig. 4 a-b. Yahl, Mount Gambier.

youngi Plicatula *Plicatula*
Chapman 1922, p. 5, pl. 1, fig. 4-5. Lower beds, Muddy Creek.

Gasteropoda

abbreviata Harpa *Austroharpa*
Tate 1889, p. 150, pl. VI, fig. 7. Lower bed, Muddy Creek.

abbreviatus Guraleus (Paraguraleus) *Antiguraleus*
Powell 1944, p. 50, pl. 5, fig. 11. Abattoirs Bore 400-500 ft, Adelaide.

abboti Triton *Austrosassia*
Tenison Woods 1876, p. 24, fig. VIII. Table Cape.

abjecta Purpura (Trochia) *Dicathais*
Tate 1888, p. 114, pl. XII, fig. 8. Upper beds, Muddy Creek.

absidata Nannamoria *Paramoria*
Cotton 1949a, p. 192, pl. 14. Lower beds, Muddy Creek.

acanthopterus Typhis *Typhis*
Tate 1888, p. 92, pl. 1, fig. 2. Mornington.

acanthostephes Fusus *Columbarium*
Tate 1888, p. 133, pl. VII, fig. 7. Mornington.

accrescens Trichotropis *Cerithioderma*
Tate 1890, p. 189. 1892, pl. XII, fig. 11. Lower beds, Muddy Creek.

aciformis Fusus *Fractolatirus*
Tate 1888, p. 139, pl. VII, fig. 5 a, b. Mornington.

acinella Turritella *Colpospira*
Chapman & Crespin 1928, p. 115, pl. VIII, fig. 45. Sorrento Bore, 1310 ft.

acra Sophismalepas *Amblychilepas*
Cotton 1947, p. 665, pl. XXI, fig. 4. 5. Salisbury Bore 330 ft.

acricula Turritella *Gazameda*
Tate 1893, p. 339, pl. VIII, fig. 4; pl. IX, fig. 4, 7, 8. River Murray Cliffs.

acrisecta Syrnola *Puposyrnola*
Ludbrook 1941, p. 92, pl. V. fig. 2. Abattoirs Bore, Adelaide.

acrotholoides Conus *Conus*
Tate 1890, p. 199. 1892, pl. VIII, fig. 7. Mornington.

actinostephes Peristernia *Microcolus*
Tate 1888, p. 158, pl. IX, fig. 10. Adelaide Bore, Kent Town.

actinotus Thylacodes *Lilax*
Tate 1893, p. 342, pl. IX, fig. 1. Adelaide Bore, Kent Town.

aculeata Rapana *Xanthochorus*
Tate 1888, p. 113, pl. II, fig. 8. Mornington.

acuticarinata Adeorbis *Zeminolia*
Tenison Woods 1879a, p. 238, pl. 21, fig. 9. Lower beds, Muddy Creek.

acuticostata Lyria — *Lyria*

Chapman 1920, p. 241. Ooldea.

acutispira Leiostraca — *Leiostraca*

Tenison Woods 1879b, p. 3, pl. 1, fig. 2. Lower beds, Muddy Creek.

acutispira Mappingia — *Mappingia*

Type species of genus

Ludbrook 1941, p. 99, pl. V, fig. 21. Abattoirs Bore, Adelaide.

acutum Solarium = *Architectonica balcombensis* Finlay 1927

Tenison Woods 1879a, p. 236, pl. 21, fig. 11. non Conrad 1860. Lower beds, Muddy Creek.

additoides Terebra — *Pervicacia*

Tenison Woods 1877, p. 95. Table Cape.

adelaidae Conus (Floraconus) — *Floraconus*

Ludbrook 1958, p. 98, pl. 6, fig. 3. Weymouth's Bore 310-330 ft, Adelaide.

adelaidae Oliva — *Gemmoliva*

Tate 1889, p. 145, pl. VIII, fig. 6. Adelaide Bore, Kent Town.

adelaidae Splendrillia — *Splendrillia*

Powell 1944, p. 31, pl. 2, fig. 6. Abattoirs Bore 400-500 ft, Adelaide.

adelaidensis Ancilla (Turrancilla) — *Turancilla*

Ludbrook 1958, p. 68, pl. 3, fig. 9. Weymouth's Bore 310-330 ft, Adelaide.

adelaidensis Bathytoma — *Epidirona*

Ludbrook 1941, p. 97, pl. V, fig. 17. Abattoirs Bore Adelaide.

adelaidensis Cheilea — *Cheilea*

Ludbrook 1941, p. 94, pl. V, fig. 8, 9. Abattoirs Bore, Adelaide.

adelaidensis Cymatiella — *Cymatiella*

Ludbrook 1941, p. 94, pl. V, fig. 10. Abattoirs Bore, Adelaide.

adelaidensis Guraleus — *Eguraleus*

Powell 1944, p. 49, pl. 6, fig. 13. Abattoirs Bore 400-500 ft, Adelaide.

adelaidensis Liratomina — *Liratomina*

Powell 1944, p. 27, pl. 7, fig. 5. Abattoirs Bore 400-500 ft, Adelaide.

adelaidensis Murex — *Pterochelus*

Tate 1888, p. 99, pl. II, fig. 4. Adelaide Bore, Kent Town.

adelaidensis Nina — *Echininus*

Cotton 1947, p. 666, pl. XXI, fig. 17, 18. Salisbury Bore 350 ft.

adelaidensis Syrnola (Evelynella) — *Evelynella*

Ludbrook 1957, p. 42, pl. 3, fig. 9. Hindmarsh Bore 450-487 ft.

adelaidensis Terebralia — *Chavanicerithium*

Type species of genus

Howchin & Cotton 1936, p. 31, pl. 1, fig. 1, 2. Glanville Bore 375-400 ft.

adelaidensis Turbonilla (Chemnitzia) — *Chemnitzia*

Ludbrook 1957, p. 45, pl. 3, fig. 13. Weymouth's Bore 310-330 ft, Adelaide.

adelaidensis Turritella acricula — *Gazameda*

Cotton & Woods 1935, p. 376, fig. 2. Abattoirs Bore 300-500 ft, Adelaide.

adelaidensis Thylacodes — *Anguillospira*
Tate 1893, p. 343, pl. IX, fig. 9. Adelaide Bore, Kent Town.

adelaidensis ? Veprecula — *Veprecula*
Powell 1944, p. 61, pl. 6, fig. 11. Abattoirs Bore 400-500 ft, Adelaide.

adelomorphus Streptochetus — Invalid name change
nom, nov. for "*Fusus exilis* Tate" non Conrad. Cossmann 1901, p. 31.

aequisulcata Gibbula — *Notogibbula*
Tenison Woods 1877, p. 98. Table Cape.

affinis Peristernia — *Microcolus*
Tate 1888, p. 157, pl. XI, fig. 7. Table Cape.

agnewi Voluta — *?*
Johnston 1880, p. 37. Table Cape.

aldingae Marginella — *Plicaginella*
Tate 1878, p. 90. Lower beds, Aldinga.

aldingae Turritella — *Spirocolpus*
Tate 1882, p. 45. 1893, p. 336, pl. VIII, fig. 1. Adelaide Bore, Kent Town.

aldingensis Comitas (Carinacomitas) — *Comitas*
Powell 1944, p. 18, pl. 1, fig. 7. Lower beds, Aldinga.

aldingensis Fusus — *Tectifusus*
Tate 1888, p. 138, pl. III, fig. 10. Lower beds, Aldinga.

aldingensis Mauidrillia — *Mauidrillia*
Powell 1944, p. 36, pl. 4, fig. 6. Lower beds, Aldinga.

aldingensis Natica — *Friginatica*
Tate 1893, p. 326, pl. X, fig. 5. Adelaide Bore, Kent Town.

aldingensis Peristernia — *Brocchitas*
Tate 1888, p. 156, pl. VIII, fig. 8 a, b. Lower beds, Aldinga.

allporti Voluta — *Ericusa*
Johnston 1880, p. 35. Table Cape.

alokiza Mitra — *Eumitra*
Type species of genus
Tenison Woods 1879b, p. 9, pl. 2, fig. 12. Lower beds, Muddy Creek.

alta Risella — *Bembicium*
Tate 1894, p. 184, pl. XI, fig. 4. Spring Creek; Lower beds, Muddy Creek.

alternata Thalotia — *Thalotia*
Tenison Woods 1877, p. 97. Table Cape.

alticostata Voluta — *Pterospira*
Tate 1889, p. 122, pl. V, fig. 7. Lower beds, Muddy Creek.

altifrons Peristernia — *?*
Tate 1888, p. 156, pl. X, fig. 1. River Murray cliffs near Morgan.

altiplica Bullinella — *Cylichna*
Cossmann 1897, p. 14, pl. II, fig. 9-11. Mornington.

altispira Marginella — *Dentimargo*
May 1922, p. 10, pl. IV, fig. 5. Table Cape.

altispira Pyrula — *Ficus*
Pritchard 1896, p. 85, pl. III, fig. 2, 3. Table Cape.

altispira Turris — *Apiotoma*
May 1922, p. 12, pl. IV, fig. 8. Table Cape.

alveolata Cancellaria — *?*
Tate 1889, p. 154, pl. X, fig. 7 a, b. Lower beds, Muddy Creek.

alveolatus Murex = *Murex (Muricopsis) graniformis* Harris 1897.
Tate 1888, p. 108, pl. 3, fig. 12, non J. de C. Sowerby 1823. Lower beds, Muddy Creek.

amblyceras Murex — *Siratus*
Tate 1888, p. 101, pl. II, fig. 12. Mornington.

ampullacea Cypraea — *Austrocypraea*
Tate 1890, p. 205. 1892, pl. V, fig. 4. Mornington.

amygdalina Cypraea = *Cypraea tatei* Cossmann 1903
Tate 1890, p. 211, non Grateloup 1847. 1892, pl. VI, fig. 8. Well sinking, Murray Desert (Tareena).

anceps Trophon — *Emozamia*
Tate 1888, p. 112, pl. IX, fig. 6. Oyster banks, Aldinga Bay.

ancilloides Voluta — *Ericusa*
Tate 1889, p. 126, pl. III, fig. 7. Mornington.

angulata Tudicula — *Tudicla*
Tate 1888, p. 160, pl. X, fig. 9. Lower beds, Muddy Creek.

angulifera Trichotropis — *Cerithioderma*
Tate 1890, p. 186. 1892, pl. XIII, fig. 5. Adelaide Bore, Kent Town.

angulosa Terebra — *Nototerebra*
Tate 1889, p. 163, pl. VIII, fig. 13. Well sinking, Murray Desert (Tareena).

angustata Bullinella — *Cylichna*
Cossmann 1897, p. 11, pl. II, fig. 1, 2. Adelaide Bore, Kent Town.

angustata Oliva = *Oliva praenominata* Cossmann 1912
Tate 1889, p.. 144, pl. VIII, fig. 7a, b. non Marrat 1870. Lower beds, Muddy Creek.

angusticostata Austromitra — *Austromitra*
Ludbrook 1941, p. 96, pl. V, fig. 13. Abattoirs Bore, Adelaide.

angustifrons Genotia — *Micantapex rhomboidalis*
Tate 1894, p. 175, pl. X, fig. 7, 7a, b. Lower beds, Muddy Creek; Gellibrand; Fyansford; Mornington.

angustior Cypraea platyrhyncha — *Umbilia*
Pritchard 1896, p. 107, pl. 4, fig. 8, 9. Table Cape.

angustior Voluta weldii — *Pseudocymbiola*
Pritchard 1913, p. 194, pl. XX, fig. 4, 5. Table Cape.

annectans Triton — *Austrosassia*
Tate 1888, p. 121, pl. V, fig. 3. Lower beds, Muddy Creek.

annulata Styliola — *Clio*
Tate 1887c, p. 195, pl. XX, fig. 1, Lower beds, Aldinga.

antecedens Homolocantha — *Homolocantha*
Ludbrook 1958, p. 58, pl. 2, fig. 18. Tennant Bore, Salisbury.

anticingulata Cylichna — *Cylichna*
Ludbrook 1958, p. 105, pl. 6, fig. 19. Weymouth's Bore 310-330 ft, Adelaide.

anticingulata Voluta — *Ternivoluta*
McCoy 1866a, p. 379. 1874, p. 24, pl. VI, fig. 2-4. A^d 22, Bird Rock, Torquay.

anticoronata Mitra — *Parvimitra*
Johnston 1880, p. 34. Table Cape.

antipodum Ellatrivia — *Ellatrivia*
Schilder 1935, p. 332, fig. 5, 6, 7. Lower beds, Muddy Creek.

antiquata Concholepas — *Concholepas*
Tate 1894, p. 171, pl. X, fig. 2. Mornington, Lower beds Muddy Creek.

antiscalaris Voluta — *Ternivoluta*
(Type species of *Austrovoluta*)
McCoy 1866a, p. 378. 1874, p. 26, pl. VI, fig. 5. A^d 14, Curlewis.

antispinosus Volutilithes — *Ternivoluta*
Tate 1899a, p. 107, pl. 1, fig. 5 a, b. Well sinking, Tareena or Mindarie.

aperturata Montfortula — *Montfortula*
Chapman & Gabriell 1923, p. 30, pl. II, fig. 18-20, pl. III, fig. 34. Gellibrand River.

apheles Cerithium — *?*
Tenison Woods 1879a, p. 232, pl. 20, fig. 15. Lower beds, Muddy Creek.

apicilirata Colina — *Colina*
Tate 1894, p. 180, pl. XII, fig. 7, 7a, b. Gellibrand River.

apicilirata Peristernia — *Microcolus*
Tate 1888, p. 157, pl. IX, fig. 14. Adelaide Bore, Kent Town.

apicilirata Trichotropis — *Sirius*
Tate 1890, p. 190. 1892, pl. XIII, fig. 1. Bird Rock Bluff; Mornington.

approximans Columbella — *Antizafra*
Pritchard 1904, p. 325, pl. XVIII, fig. 12, 13. Balcombe Bay.

approximans Peristernia — *Bedeva*
Tate 1888, p. 153, pl. IX, fig. 2. Upper beds, Muddy Creek.

aptycha Tornatina — *Acteocina*
Cossmann 1897, p. 8, pl. 1, fig. 22, 23. Lower beds, Muddy Creek.

arachnoideus Calyptropsis — *Calyptropsis*
Type species of genus
Tate 1893, p. 333, pl. VII, fig. 9. Adelaide Bore, Kent Town.

arata Natica — = *Natica pritchardi* Cossmann 1907
Tate 1893, p. 324, pl. X, fig. 8 non Lycett 1863. River Murray Cliffs.

aratula Bullinella — *Cylichna*
Cossmann 1897, p. 12, pl. II, fig. 3, 4. Mornington.

archeri Cypraea — *Austrocypraea*
Tenison Woods 1876, p. 23, fig. IX. Table Cape.

archimedes Serratifusus — *Serratifusus*
Darragh 1969, p. 96, pl. 5, fig. 94-97. Grice Creek.

arena Marginella — *Marginella*
Cotton 1949b, p. 214, pl. XVIII. Bore 21, S.A. Mines Dept., 400 ft.

armatus Triton. — *Austrotriton*
Tate 1888, p. 121, pl. V. fig. 1. Well sinking, Murray Desert (Tareena).

arrugosa Manulona — *Manulona*
Type species of genus.
Ludbrook 1941, p. 91, pl. IV, fig. 26. Abattoirs Bore, Adelaide.

asper Thylacodes — *Lilax*
Tate 1893, p. 343, pl. IX, fig. 10. Gellibrand River.

asperulus Murex — *Bedeva*
Tate 1888, p. 106, pl. III, fig. 1. Mornington.

asperulus Sipho — *Varicosipho*
Tate 1888, p. 145, pl. VI. fig. 5. Lower beds, Muddy Creek.

aster Adeorbis — *Bellastraea*
Tenison Woods 1879a, p. 238, pl. 21, fig. 6. Lower beds, Muddy Creek.

asteriscus Murex — ?
Tate 1888, p. 102, pl. II, fig. 10. Lower beds, Muddy Creek.

atkinsoni Marginella — *Protoginella*
May 1922, p. 9, pl. IV, fig. 1. Table Cape.

atkinsoni Turbo — *Euninella*
Pritchard 1896, p. 118, pl. 3, fig. 12. Table Cape.

atkinsoni Voluta — *Pterospira*
Pritchard 1896, p. 100, pl. 3, fig. 1. Table Cape.

atomus Zizyphinus — *Calliostoma*
Johnston 1880, p. 38, Table Cape.

atractoides Conus (Conorbis) — *Conorbis*
Tate 1890, p. 200. 1892, pl. 9, fig. 7. Adelaide Bore, Kent Town.

atractoides Mitra — *Tiara*
Tate 1889, p. 139, pl. 4, fig. 11. Lower beds, Muddy Creek.

atypha Mitra — *Strigatella*
Tate 1889, p. 138, pl. 4, fig. 6. Upper beds, Muddy Creek.

aulacoessa Eburnopsis — *Eburnopsis*
Type species of genus
Tate 1889, p. 117, pl. 4, fig. 3. Lower beds, Muddy Creek.

australe Umbraculum — *Umbraculum*
Harris 1897, p. 23, pl. 1, fig. 7 a-c. Lower beds, Muddy Creek.

australiensis Umbrella — *Umbraculum australe*
Cossmann 1897, p. 20, pl. 2, fig. 29-31. Mornington.

australis Erato — *Proterato*
Tate 1878, p. 96. 1892, pl. 13, fig. 9. Lower beds, Aldinga.

avellanoides Cypraea (Trivia) — *Nototrivia*
Type species of genus
McCoy 1867, p. 436. 1876a, p. 36, pl. 28; 29. fig. 3-3c. Grice Creek.

balcombensis Apiotoma — *Apiotoma*
Powell 1944, p. 20, pl. 7, fig. 10. Balcombe Bay.

balcombensis Architectonica — *Discotectonica*
Finlay 1927b, p. 501. nom. nov. for *Solarium actum* Tenison Woods 1879 non Conrad 1860.

balcombensis Asperdaphne — *Asperdaphne*
Powell 1944, p. 59, pl. 6, fig. 7. Balcombe Bay.

balcombensis Austrotriton — *Austrotriton*
Chapple 1941, p. 119, pl. XIV, fig. 5. Grice Creek.

balcombensis Calliostoma — *Laetifautor*
Chapple 1934, p. 165, pl. XIX, fig. 6, 6a. Balcombe Bay.

balcombensis Columbella — *Antizafra*
Pritchard 1904, p. 324, pl. XVIII, fig. 10, 11. Balcombe Bay.

balcombensis Guraleus (Paraguraleus) — *Antiguraleus*
Type species of *Paraguraleus*
Powell 1944, p. 50, pl. 5, fig. 13. Balcombe Bay.

balcombensis Maoritomella — *Maoritomella*
Powell 1944, p. 39, pl. 4, fig. 12. Balcombe Bay.

balcombensis Notopeplum — *Notopeplum*
Finlay 1930, p. 46. Balcombe Bay.

balcombensis Teleochilus — *Teleochilus*
Powell 1944, p. 65, pl. 6, fig. 1. Balcombe Bay.

balcombica Eschatocypraea — *Notoluponia pyrulata*
Type species of *Eschatocypraea*
Schilder 1966, p. 270, fig. 1. Fossil Beach, Mornington.

balteata Borsonia — *Borsonia*
Tate 1898a, p. 395, pl. 19, fig. 10. Belmont.

balteatella Natica — *Conuber*
Tate 1893, p. 321, pl. VI, fig. 7. Dry Creek Bore, Adelaide.

basedowi Hadriania — *Xenotrophon*
nom. nov. for *Murex irregularis* Tate non Bellardi 1872. Cossmann 1903, p. 46.

basicinctus Murex — *Siratus*
Tate 1888, p. 99, pl. II, fig. 9. River Murray near Morgan.

basinodosa Scalaria (Nodiscala) — *Hirtoscala*
Tate 1890, p. 224. 1892, pl. XI, fig. 2, 2a. Lower beds, Muddy Creek.

bassi Apiotoma — *Apiotoma*
Pritchard 1904, p. 328, pl. XIX, fig. 11. Pt. Flinders.

bassi Pleurotomaria — *Mikadotrochus*
Pritchard 1903b, p. 85, pl. XIII, fig. 1, 2. Lower beds, Table Cape.

bicarinata Styliola — *Clio*
Tate 1887c, p. 195, pl. XX, fig. 9. Muddy Creek.

bicarinatus Laetifautor — *Laetifautor*
Ludbrook 1941, p. 85, pl. IV, fig. 13. Abattoirs Bore, Adelaide.

biconicus Murex — *Murexsul*
Tate 1888, p. 105, pl. 1, fig. 3. Well sinking, Murray desert.

bicrassiplicata Serrata — *Serrata*
Ludbrook 1958, p. 83, pl. 3, fig. 21. Weymouth Bore 310-330 ft, Adelaide.

bicurvata Eulima — *Melanella*
Chapman & Crespin 1928, p. 108, pl. VII, fig. 33. 990 ft. Sorrento Bore.

bidens Mangelia — *Etrema*
Tenison Woods 1879a, p. 227, pl. 20, fig. 2. Lower beds, Muddy Creek.

bidenticulatum Ataxocerithium — *Ataxocerithium*
Ludbrook 1957, p. 25, pl. 2, fig. 6, 7. Weymouth Bore.

bifrons Murex — *Pterynotus*
Tate 1888, p. 97, pl. 1, fig. 12. Adelaide Bore, Kent Town.

biornata Mitra — *Cancilla*
Tate 1889, p. 142, pl. V. fig. 10. Lower beds, Muddy Creek.

biornatum Dolium — *Eudolium*
Tate 1894, p. 173, pl. X, fig. 5. Fyansford; Lower beds, Muddy Creek.

bisculptus Xenuroturris (Veruturris) — *Veruturris*
Powell 1944, p. 11, pl. 1, fig. 4. Abattoirs Bore, 400-500 ft, Adelaide.

bivaricatus Clypeomorus — *Zeacumantus*
Ludbrook 1941, p. 89, pl. IV, fig. 20. Abattoirs Bore, Adelaide.

blaxlandii Zizyphinus — *Calliostoma*
Tenison Woods 1877, p. 96. Table Cape.

bovarius Serratifusus — *Serratifusus*
Darragh 1969, p. 91, pl. 2, fig. 8, 11-13. Amphitheatre, Leigh River.

brachypyga Cypraea — *Notoluponia*
Tate 1890, p. 207, 1892, pl. VI, fig. 3. Lower beds, Muddy Creek, Mornington.

brevicaudalis Austroclavus — *Austroclavus*
Powell 1944, p. 40, pl. 2, fig. 2. Balcombe Bay.

brevicaudatus Trophon — *Litozamia*
Tate 1888, p. 110, pl. IX, fig. 9. Lower beds, Muddy Creek.

breviplicata Gisortia — *Palliocypraea*
Schilder 1926, p. 373 (Tate 1890, p. 210). Lower beds, Muddy Creek.

brevis Cypraea (Aricia) eximia — *Umbilia*
McCoy 1876a, p. 36. Grice Creek.

brevis Pisania — *Zeapollia*
Tate 1888, p. 166, pl. IX, fig. 8. Muddy Creek.

brevispira Voluta strophodon — *Pseudocymbiola*
Pritchard 1913, p. 194 (McCoy 1876b, p. 26, pl. 37, fig. 2). Lower beds, Muddy Creek? (Lake Bullenmerri?).

bulbodes Fusus — *Austrolithes*
Type species of genus
Tate 1888, p. 139, pl. VII, fig. 8. Mornington.

bulbulifera Scalaria (Punctiscala) — *Punctiscala*
Tate 1890, p. 228. 1892, pl. XI, fig. 3. Lower beds, Muddy Creek.

bullaeformis Gaskoinia — *Amphiperas*
Tate 1898a, p. 390, pl. 19, fig. 5. Lower beds, Muddy Creek.

bullaeformis Roxania — *Damoniella*
Cossmann 1897, p. 17, pl. II, fig. 21, 22. Lower beds, Muddy Creek.

burni Berthelinia — *Berthelinia*
Ludbrook & Steel 1961, p. 229, pl. 12. fig. 1-4. Elizabeth Oval Bore 319-417 ft, Adelaide.

caelatus Pseudexomilus — *Pseudexomilus*
Type species of genus
Powell 1944, p. 62, pl. 6, fig. 12. Abattoirs Bore 400-500 ft, Adelaide.

cainozoica Columbella — *Retizafra*
Tenison Woods 1877, p. 110. Table Cape.

cainozoica Montfortula — *Montfortula*
Chapman & Gabriel 1923, p. 31, pl. II, fig. 21, pl. III, fig. 36. Lower beds, Muddy Creek.

calcaratum Columbarium — *Columbarium*
Darragh 1969, p. 75, pl. 3, fig. 29, 33, 39. Point Flinders near Cape Otway.

callosa Cylichnella — *Cylichnania*
Cossmann 1897, p. 17, pl. II, fig. 19, 20. Lower beds, Aldinga.

calva Teinostoma — *Starkeyna*
Chapman & Crespin 1928, p. 107, pl. VI, fig. 31 a, b. Sorrento Bore, 1,180 ft.

calvulata Cancellaria — *Cancellaphera*
Tate 1889, p. 153, pl. IX, fig. 3. Mornington.

calvus Murex — *Pterynotus*
Tate 1888, p. 96, pl. 1, fig. 11. Lower beds, Aldinga.

camplytropis Murex — *?*
Tate 1888, p. 105, pl. III, fig. 2. Mornington.

canaligradata Retusa (Semiretusa) — *Semiretusa*
Ludbrook 1958, p. 103, pl. 6, fig. 15. Weymouth Bore 310-330 ft, Adelaide.

cancellata Cominella — *Belophos*
Tenison Woods 1877, p. 107. Table Cape.

caperata Cancellaria — *Anapepta*
Tate 1889, p. 158, pl. IX, fig. 7. Mornington.

capillata Cancellaria — *Inglisella*
Tate 1889, p. 158, pl. X, fig. 10. Lower beds, Muddy Creek.

capillatus Semivertagus — *Semivertagus*
Tate 1894, p. 178, pl. XI, fig. 1, 1a. Dry Creek Bore.

capitata Voluta = *Scaphella macrocephala* Finlay 1927

Tate 1889, p. 127, pl. II, fig. 3, a, b. non Perry 1811. Well sinking, Murray Desert (Tareena).

carinatus Solutofusus *Solutofusus*

Type species of genus

Pritchard 1898, p. 102, pl. VII, fig. 1, 1a, 2. Balcombe Bay.

cassida Marginella *Neptoginella*

Cotton 1949b, p. 216, pl. 18, fig. 400 ft, S.A. Mines Dept Bore 21.

cassida Mitra *Parvimitra*

Tate 1889, p. 144, pl. VI, fig. 5. Upper beds, Muddy Creek.

cassidiformis Marginella *Urniginella*

Tate 1878, p. 91. Muddy Creek.

cassinoides Harpa *Austroharpa*

Tate 1889, p. 150, pl. VI, fig. 4. Well sinking, Murray Desert (Tareena).

catenifera Terebra *Gemmaterebra*

Type species of genus

Tate 1886a, p. 5. 1889, p. 160, pl. VIII, fig. 14. Upper beds, Muddy Creek.

cathedralis Voluta *Notovoluta*

Tate 1888, p. 176, pl. XIII, fig. 10. 1889, p. 131. Lower beds, Muddy Creek.

cera Umbilia *Umbilia*

Cotton 1947, p. 667, pl. XXI, fig. 1-3. Abattoirs Bore 320-410 ft, Adelaide.

chapplei Apiotoma *Apiotoma*

Powell 1944, p. 21, pl. 3, fig. 6. Balcombe Bay.

chapplei Daphnella *Daphnella*

Powell 1944, p. 59, pl. 6, fig. 6. Lower beds, Muddy Creek.

chapplei Guraleus *Guraleus*

Powell 1944, p. 47, pl. 4, fig. 1. Abattoirs Bore 400-500 ft, Adelaide.

charma Marginella *Marginella*

Cotton 1949b, p. 215, pl. XVIII. 360 ft Bore 28, S.A. Mines Dept.

chrysalida Rissoa (Onoba) *Pisinna*

Chapman & Gabriel 1914, p. 322, pl. XXVIII, fig. 32, 33. Mallee Bore 9, 254-256 ft.

cingulata Dennantia *Dennantia*

Tate 1888, p. 162, pl. XII, fig. 2, 5a, b. Mornington.

cingulata Latirofusus *Zexilia*

Pritchard 1896, p. 83, pl. II, fig. 5, 6. Lower beds, Spring Creek.

circinata Syntomodrillia *Syntomodrillia*

Powell 1944, p. 33, pl. 2, fig. 12. Upper beds, Torquay.

circinatus Capulus *Capulus*

Tate 1893, p. 334, pl. VII, fig. 8. Adelaide Bore, Kent Town.

citharelloides Mitra *Austromitra*

Tate 1889, p. 143, pl. V, fig. 11. Lower beds Aldinga.

citharellus Epidromus *Ratifusus*

Tate 1888, p. 129, pl. IV, fig. 6. Lower beds, Muddy Creek.

clarae Pleurotoma *Comitas*

Type species of *Carinacomitas*

Tenison Woods 1879b, p. 11, pl. 3, fig. 11, 12. Lower beds, Muddy Creek.

clarkei Gibula *?*

Tenison Woods 1877, p. 114. Table Cape.

clarki Personella *Cymatiella*

Chapman & Crespin 1933, p. 70, pl. V. fig. 11. Gippsland Lakes.

clathrata Belatomina *Belatomina*

Powell 1944, p. 25, pl. 7, fig. 9. Lower beds, Muddy Creek.

clathrata Cypraea (Cypraeidia) *Cypraedia*

Tate 1892, pl. IX, fig. 1. Tate 1893, p. 317. Lower beds, Aldinga.

clathrata Harpa *Austroharpa*

Tate 1889, p. 151, pl. VI, fig. 8. River Murray Cliffs near Morgan.

clathrata Pelicaria *Tylospira*

Tate 1885a, p. 2. 1889, p. 170, pl. X, fig. 9. Bairnsdale.

clathurella Mitra *Cancilla*

Tate 1889, p. 142, pl. VIII, fig. 8. Lower beds, Muddy Creek.

clelandi Cominella *Cominella*

Tate 1888, p. 148, pl. XI, fig. 1. pl. XIII, fig. 1. Hallet Cove.

clima Marginella *Marginella*

Cotton 1949b, p. 213, pl. XVIII. 400 ft Bore 21. S.A. Mines Dept.

clisia Marginella *Allaginella*

Cotton 1949b, p. 212, pl. XVII, Spring Creek.

clydoniatus Serratifusus *Serratifusus*

Darragh 1969, p. 95, pl. 5, fig. 79, 87, 90, 99. Murgheboluc 4A.

coarctata Mitra *Marginella winteri* Tate 1878

Tenison Woods 1879b, p. 8, pl. 2, fig. 10. non Reeve 1844. Lower beds, Muddy Creek.

cochleatus Xenuroturris (Veruturris) *Xenuroturris (Veruturris)*

Powell 1944, p. 10, pl. 7, fig. 11. Lower beds, Muddy Creek.

cochleatus Fusus *Columbarium*

Tate 1888, p. 135, pl. VIII, fig. 9. Lower beds, Aldinga.

columbelloides Daphnella *Rugobela*

Tenison Woods 1877, p. 105. Table Cape.

cominelloides Phos *Fax*

Tate 1888, p. 167, pl. IV, fig. 11. Lower beds, Muddy Creek.

complanata Mitra *Microvoluta*

Tate 1889, p. 138, pl. V, fig. 12. Adelaide Bore, Kent Town.

complexa Syntomodrillia *Syntomodrillia*

Powell 1944, p. 33, pl. 2, fig. 8. Altona Bay.

complicatus Conus *Conus*

Tate 1890, p. 195. 1892, pl. VIII, fig. 8. Lower beds, Muddy Creek; Mornington.

convexiuscula Terebra — *Spineoterebra*
Tate 1889, p. 163, pl. X, fig. 4. Upper beds, Muddy Creek.

convexus Conus (Leptoconus) — *Conus*
Harris 1897, p. 31, pl. II, fig. 5, a-d. 'Meribee Plains'.

cornuspira Cyclostrema — *Microdiscula*
Chapman & Crespin 1928, p. 107, pl. VII, fig. 32 a, b. Sorrento Bore, 1150 ft.

coronata Pelicaria — *Tylospira*
Tate 1885a, p. 2. 1889, p. 171, pl. X, fig. 6, 13. Upper beds, Muddy Creek.

corpulenta Marginella — *Protoginella*
May 1922, p. 9, pl. IV, fig. 2. Table Cape.

corrugata Calyptraea — = *Zegalerus tatei Finlay 1927*
Tate 1893, p. 331, pl. VII, fig. 6. non Broderip 1835. Upper beds, Muddy Creek.

cossmanni Basilissa — *Basilissa*
Tate 1894, p. 185, pl. XI, fig. 8. Adelaide Bore, Kent Town.

cossmanni Hemiconus — *Hemiconus*
Tate 1898a, p. 391, pl. 19, fig. 11. Lower beds, Muddy Creek.

costata Peristernia murrayana — *?*
Pritchard 1896, p. 87, pl. II, fig. 4. Table Cape.

costata Trichotropis — *Sirius*
Tate 1890, p. 191. 1892, pl. XIII, fig. 8. Adelaide Bore, Kent Town.

costata Tudicula — *Tudicla*
Tate 1888, p. 159, pl. X, fig. 8. Well sinking, River Murray Desert.

costellifera Voluta — *Paramoria*
Tate 1889, p. 131, pl. II, fig. 8. Lower beds, Muddy Creek.

coxi Mitraria (Eumitra) — *Eumitra*
Ludbrook 1958, p. 71, pl. 6, fig. 4. McDonald's bank, Muddy Creek.

coxi Retusa (Semiretusa) — *Semiretusa*
Ludbrook 1958, p. 104, pl. 6, fig. 21. Weymouth Bore 310-330 ft, Adelaide.

craspedotus Fusus — *Serratifusus*
Type species of genus
Tate 1888, p. 134, pl. VII, fig. 4. Lower beds, Muddy Creek.

crassa Calyptraea — *Sigapatella*
Tate 1893, p. 332, pl. VII, fig. 2, 7. Gippsland Lakes.

crassa Natica subinfundibulum. — *Sigaretotrema*
Tate 1893, p. 327. Muddy Creek, Cheltenham.

crassa Terebra — *Pervicacia*
Tate 1886a, p. 7. 1889, p. 161, pl. 9, fig. 9. Upper beds, Aldinga.

crassicostata Ellatrivia longisulcata — *Ellatrivia*
Schilder 1935, p. 334, fig. 11. Lower beds, Muddy Creek.

crassicosta Haurakia — *Haurakia*
May 1922, p. 11, pl. IV, fig. 6. Table Cape.

crassicostatus Triton — *Austrosassia*
Tate 1888, p. 125, pl. XI, fig. 4. Table Cape.

compta Syntomodrillia — *Syntomodrillia*
Powell 1944, p. 33, pl. 2, fig. 9. Balcombe Bay.

comptus Teleochilus — *Teleochilus*
Powell 1944, p. 66, pl. 6, fig. 3. Upper beds, Torquay.

concatenatum Ataxocerithium — *Ataxocerithium*
Tate 1894, p. 179, pl. XI, fig. 6, 6a. Adelaide Bore.

concinna Fasciolaria — *Pleia*
Tate 1888, p. 149, pl. VIII, fig. 6. Mornington.

conferta Vermicularia funicalis — *?*
Chapman 1926, p. 134, pl. X, fig. 4, a, b. Neumerella.

confirmans Cancellaphera — *Cancellaphera*
Ludbrook 1958, p. 78, pl. 6, fig. 5. Weymouth Bore, 310-330 ft, Adelaide.

conohelix Vermetus — *Lilax*
Tenison Woods 1877, p. 100. Table Cape.

conoidalis Mitra — *Parvimitra*
Tate 1889, p. 144, pl. X. fig. 2a, b. Lower beds, Muddy Creek.

conoidea Voluta (Volutoconus) = *Volutoconus* ralphi Finlay 1930
Tate 1888, p. 176, pl. XIII, fig. 9. non Renier 1804. 1889, p. 125. Lower beds, Muddy Creek.

conospira Cordieria — *Rugobela*
Tate 1898a, p. 396, pl. 19, fig. 12.

consobrina Cypraea (Aricia) — *Zoila*
McCoy 1877, p. 36, pl. XLIX, fig. 2. Moorabool River.

conspicabilis Turritella — *Colpospira*
Tate 1893, p. 339, pl. VIII, fig. 7. Gippsland Lakes.

conspicua Turris — *Zemacies*
May 1922, p. 11, pl. IV, fig. 7. Table Cape.

constricta Austrocypraea — *Austrocypraea*
Schilder 1935, p. 340, fig. 19. Grice Creek.

constricta Turbonilla — *Turbonilla*
Chapman & Crespin 1928, p. 109, pl. VII, fig. 36. Sorrento Bore 976 ft.

consutilis Pleurotoma — *Mauidrillia*
Tenison Woods 1879b, p. 9, pl. 2, fig. 5. Lower beds, Muddy Creek.

contigua Asperdaphne — *Asperdaphne*
Powell 1944, p. 60, pl. 6, fig. 8. Altona Bay.

contigua Etremopsis — *Etremopsis*
Powell 1944, p. 55, pl. 5, fig. 6. Abattoirs Bore 400-500 ft, Adelaide.

contusa Cypraea (Luponia) — *Austrocypraea*
McCoy 1877, p. 37, pl. XLIX, figs. 3, 4. Balcombe Bay. Type species of genus

contusus Cassis — *Hypocassis*
Tate 1899a, p. 108, pl. 1, fig. 1 a, b. Well sinking, Mindarie.

crassidens Marginella — *Stromboginella*
Chapman & Crespin 1928, p. 120, pl. IX, fig. 55. Gippsland Lakes.

crassigranosa Gibbula — *Ethminolia*
Tenison Woods 1877, p. 98. Table Cape.

crassigranosa Nassa — *Tavaniotha*
Tate 1888, pl. XII, fig. 6 a, b. Upper beds, Muddy Creek.

crassilabrum Voluta — *Leptoscapha*
Tate 1889, p. 128, pl. III, fig. 2 a-c. Lower beds, Muddy Creek.

crassilirata Bela — *Liratomina*
Tate 1888, p. 173, pl. IV, fig. 7. Muddy Creek.

crassiliratus Murex — *?*
Tate 1888, p. 107, pl. III, fig. 5. Upper beds, Muddy Creek.

crassiliratus Trophon (Enatimene) — *Enatimene*
Chapple 1941, p. 123, pl. XIV, fig. 7. ½ mile W. of Princetown.

crassina Cominella — *Cominella*
Tate 1888, p. 147, pl. X, fig. 4. Upper beds, Muddy Creek.

crassiplicata Widningia — *Bedeva*
(Type species of *Widningia*)
Ludbrook 1941, p. 95, pl. V, fig. 25. Abattoirs Bore, Adelaide.

crassireticulata Tugalia — *Tugali*
Pritchard 1896, p. 125, pl. III, fig. 4, 5. Table Cape.

cratericulus Thylacodes — *Lilax*
Tate 1893, p. 342, pl. IX, fig. 3. Mornington.

crebrecostatus Aesopus — *Turricolumbus*
Type species of genus
Tenison Woods 1879b, p. 15, pl. 3, fig. 5. Lower beds, Muddy Creek.

crebrelamellata Scalaria (Acrilla) — *Acrilla*
Tate 1890, p. 234. 1892, pl. XII, fig. 8. Lower beds, Muddy Creek.

crebrigranosus Sipho — *Varicosipho*
Tate 1888, p. 145, pl. III, fig. 8. Lower beds, Muddy Creek.

crebrinodulosus Laetifautor — *Laetifautor*
Ludbrook 1941, p. 85, pl. IV, fig. 9. Abattoirs Bore, Adelaide.

crenularoides Drillia — *Comitas*
Pritchard 1886, p. 110, pl. III, fig. 6, 7. Table Cape.

cribarioides Cerithium — *Cerithiella*
Tenison Woods 1879a, p. 231, pl. 20, fig. 14. Lower beds, Muddy Creek.

cribrosa Voluta — *Notovoluta*
Tate 1889, p. 129, pl. III, fig. 8. Lower beds, Aldinga.

cribrosus Triton — *Austrosassia*
Tate 1888, p. 125, pl. V, fig. 5. Adelaide Bore, Kent Town.

crista Marginella — *Volvarinella*
Cotton 1949b, p. 216, pl. XVIII, 450 ft Weymouth Bore, Adelaide.

cristata Fasciolaria — *Pleuroploca*
Tate 1888, p. 151, pl. VIII, fig. 4. Lower beds, Muddy Creek.

cryptoploca Fasciolaria — *Pleuroploca*
Tate 1888, p. 151, pl. VIII, fig. 2. Lower beds, Muddy Creek.

cudmorei Cellana — *Cellana*
Chapman & Gabriel 1923, p. 23, pl. 1, fig. 1. pl. 3, fig. 27, 28. Batesford.

cuneopsis Bullinella — *Cylichna*
Cossmann 1897, p. 13, pl. II, fig. 5, 6. Lower beds, Muddy Creek.

cunninghamensis Natica — *Conuber*
nom. nov. for *Natica (Neverita) varians* Ttate 1893 non Dujardin 1837 Harris 1897, p. 257.

curlewisensis Solutofusus — *Solutofusus*
Chapman 1922, p. 14, pl. III, fig. 21. Curlewis.

currongae Turbonilla (Chemnitzia) — *Chemnitzia*
Ludbrook 1957, p. 45, pl. 3, fig. 16. Hindmarsh Bore 450-487 ft.

curtansata Vitularia — *Urosalpinx*
Tate 1888, p. 114, pl. VI, fig. 4. Lower beds, Muddy Creek.

cuspidatus Conus — *Conus*
Tate 1890, p. 194. 1892, pl. VII, fig. 1, 1a. Muddy Creek, Mornington, River Murray near Morgan.

cuspidatus Guraleus — *Daphnella*
Chapple 1934, p. 164, pl. XIX, fig. 5, 5a. Balcombe Bay.

cylindracea Scalaria (Acrilla) — *Mammiscala*
Tate 1890, p. 233. 1892, pl. XII, fig. 6. Lower beds, Muddy Creek.

cyphus Triton — *Austrotriton*
Tate 1888, p. 119, pl. V. fig. 11. Mornington.

danae Eulima — *Margineulima*
Tenison Woods 1879b, p. 2, pl. 1, fig. 1. Lower beds, Muddy Creek.

daphnelloides Mitra — *Mitrithara*
Tenison Woods 1879b, p. 7, pl. 2, fig. 3. Lower beds, Muddy Creek.

daphnes Nototrivia avellanoides — *Nototrivia*
Schilder 1966, p. 273. Grice Creek.

decemcostata Austrodrillia — *Syntomodrillia*
Ludbrook 1941, p. 98, pl. V, fig. 19. Abattoirs Bore, Adelaide.

decipiens Fasciolaria — *Pleia*
Type species of genus
Tate 1888, p. 150, pl. VIII, fig. 1. Lower beds, Muddy Creek.

decomposita Genotia — *Micantapex*
Tate 1894, p. 175, pl. X, fig. 8 (7 c on plate). Gellibrand River, Fyansford.

delicatissima Emarginula — *Emarginula*
Chapman & Gabriel 1923, p. 26, pl. I, fig. 11, 12; pl. 3, fig. 30, 31. Balcombe Bay.

delicatulus Pseudoinquisitor — *Inquisitor*
Powell 1944, p. 29, pl. 3, fig. 4. Gippsland Lakes.

dilatoria Emarginula — *Emarginula*
Ludbrook 1956, p. 9, pl. 2, fig. 3. Hindmarsh Bore 450-487 ft, Adelaide.

dilectoides Pleurotoma (Drillia) — *Tomopleura*
Chapman & Gabriel 1914, p. 327, pl. XXVIII, fig. 37. Gippsland Lakes.

disjunctus Typhis — *Typhina*
Tate 1888, p. 92, pl. I, fig. 1. Lower beds, Muddy Creek.

dissitus Latiaxis — *Latiaxis*
Cotton 1947, p. 667, pl. XXI, fig. 9, 10. Abattoirs Bore, Adelaide.

distinguendus Actaeon — *Acteon*
Cossmann 1897, p. 3, pl. i, fig. 6, 7. Lower beds, Muddy Creek.

dolicha Scalaria (Hemiacirsa) — *Mammiscala*
Tate 1892, pl. XII, fig. 10. Mornington.

doma Marginella — *Vetaginella*
Cotton 1949b, p. 213, pl. XVIII. 360 ft. Bore 28, S.A. Mines Dept.

dorsata Cypraea — *Gigantocypraea*
Tate 1890, p. 212. 1892, pl. x, fig. 4; pl. xi, fig. 6. Lower beds, Muddy Creek, Mornington.

dubia Rissoa — Nomen dubium
Johnston 1880, p. 33. Table Cape.

dubitabilis Crepidula — *Zeacrypta*
Tate 1893, p. 330, pl. IX, fig. 5. Gippsland Lakes.

dumetosus Fusus — *Propefusus*
Tate 1888, p. 141, pl. IX, fig. 1. Upper beds, Muddy Creek.

duplicata Erato — *Archierato*
Johnston 1888, pl. 31, fig. 14. Table Cape.

duplicatus Teleochilus — *Teleochilus*
Powell 1944, p. 65, pl. 6, fig. 2. Grice Creek.

dublicatum Scrinium — *Scrinium*
Powell 1944, p. 45, pl. 1, fig. 8. Upper beds, Torquay.

eburneus Dissochilus — *Dissochilus*
Tate 1898a, p. 402, pl. 20, fig. 6. Lower beds, Muddy Creek.

echinatum Columbarium acanthostephes — *Columbarium*
Darragh 1969, p. 77, pl. 3, fig. 41, 44, 53, 56. Upper bed, Fossil Bluff.

echinophora Scalaria (Crisposcala) — *Crisposcala*
Tate 1890, p. 226. 1892, pl. xi, fig. 1. River Murray Cliffs; Corio Bay.

editus Optoturris — *Optoturris*
Powell 1944, p. 12, pl. 7, fig. 3. Grice Creek.

effusa Ampullina — *Ampullina*
Tate 1893, p. 327, pl. X, fig. 2, 2a. Adelaide Bore, Kent Town.

elata Tugalia — *Tugali*
Chapple 1941, p. 119, pl. XIV, fig. 8, 8a. Cement Works, Railway Tunnel, Lower Moorabool River.

dennanti Conus — *Lithoconus*
Tate 1892, pl. XI, fig. 7.

dennanti Emarginula — *Emarginula*
Chapman & Gabriel 1923, p. 27, pl. I, fig. 13, 14. pl. III, fig. 32. Grice Creek.

dennanti Heligmope — *Hartungia*
Type species of *Heligmope*
Tate 1893, p. 329, pl. VII, fig. 5, 5a. Upper beds, Muddy Creek.

dennanti Liotia — *Munditia*
Chapman & Gabriel 1914, p. 315, pl. XXVII, fig. 22, 23. Mallee Bore 8, 180-199 ft.

dennanti Mitra — *Waimatea*
Tate 1889, p. 137, pl. III, fig. 3. Lower beds, Muddy Creek.

dennanti Murex — *Siratus*
Tate 1888, p. 98, pl. II, fig. 7. Lower beds, Muddy Creek.

dennanti Phasianella — *Phasianella*
Crespin 1926, p. 119, pl. IX, fig. 16, 17. Upper beds, Muddy Creek.

dennanti Plesiotriton — *Semitriton*
Type species of genus
Tate 1898a, p. 383, pl. 19, fig. 1. Cape Otway.

denotata Kaurnella — *Kaurnella*
Type species of genus
Ludbrook 1941. p. 88, pl. V, fig. 1. Abattoirs Bore, Adelaide.

denseliratus Teleochilus — *Teleochilus*
Powell 1944, p. 64, pl. 3, fig. 10. Lower beds, Muddy Creek.

denticostatus Strombus — *Strombus*
Harris 1897, p. 217, pl. VI, fig. 8. Tallowan Well, Fowlers Bay, S.A.

depressispira Partubiola — *Partubiola*
Ludbrook 1941, p. 87, pl. IV, fig. 16. Abattoirs Bore, Adelaide.

depressula Teinostoma — *Teinostoma*
Chapman & Gabriel 1914, p. 317, pl. XXVII, fig. 24 a, b. Mallee Bore 10, 225-230 ft.

detritus Inquisitor — *Inquisitor*
Ludbrook 1941, p. 98, pl. V, fig. 18. Abattoirs Bore, Adelaide.

dictua Mitra — *Eumitra*
Tenison Woods 1879b, p. 8, pl. 3, fig. 7. Lower beds, Muddy Creek.

dictyotis Fusus — *Fusinus*
Tate 1888, p. 135, pl. VII, fig. 2, 6. Mornington.

didactica Emarginula — *Emarginula*
Ludbrook 1956, p. 8, pl. 2, fig. 2. Abattoirs Bore, Adelaide.

diductua Mitra — *Eumitra*
Tate 1899a, p. 107 (Tate 1889, pl. 4, fig. 9). Well sinking, Tareena.

didymus Murex — *Pterynotus*
Tate 1888, p. 97, pl. IV, fig. 13. Mornington.

elatus Isapis — *Agatha*
Tate 1894, p. 183, pl. X, fig. 10. Muddy Creek.

elegantior Notoluponia murraviana — *Notoluponia*
Type species of genus
Schilder 1935, p. 348, fig. 37, 38, 39. Lower beds, Muddy Creek.

eligmostoma Vaginella — *Vaginella*
Tate 1887c, p. 195, pl. XX, fig. 7. Lower beds, Muddy Creek.

ellipsoidea Voluta — *Ericusa*
Tate 1888, p. 176, pl. xiii, fig. 4. 1889, p. 127. Lower beds, Muddy Creek.

elimattae Turboella — *Turboella*
Ludbrook 1956, p. 29, pl. 2, fig. 15. Hindmarsh Bore 450-487 ft.

eothinos Isapis — *Raulinia*
Tate 1894, p. 182, pl. X, fig. 11, 11a. Spring Creek.

epidromiformis Cancellaria — *Fusiaphera*
Tate 1889, p. 154, pl. VIII, fig. 9. Lower beds, Muddy Creek.

equispiralis Maoritomella — *Maoritomella*
Powell 1944, p. 39, pl. 2. fig. 16. Torquay.

eritima Scalaria (Punctiscala) — *Hirtoscala*
Tate 1890, p. 228. 1892, pl. x, fig. 7. Lower beds, Muddy Creek.

erugata Trivia. — *Semitrivia*
Type species of genus
Tate 1890, p. 214. 1892, pl. ix, fig. 5, 5a. Lower beds, Muddy Creek.

eryma Notocypraea — *Notocypraea*
Cotton 1947, p. 668, pl. XXI, fig. 6-8. Abattoirs Bore 320-410 ft, Adelaide.

escharoides Mitra — *Mitropifex*
Tate 1889, p. 139, pl. V, fig. 8a, b. Lower beds, Muddy Creek.

escharoides Scalaria (Acrilla) — *Mammiscala*
Tate 1890, p. 232. 1892, pl. xii, fig. 5. Lower beds, Muddy Creek.

etheridgei Cancellaria — *Anapepta*
Johnston 1880, p. 32. Table Cape.

etheridgei Turbo — = *Turbo tenisoni* Finlay 1927
Tenison Woods 1877, p. 98 non Lycett 1857. Table Cape.

eucarinatus Clanculus — *Euriclanculus*
Ludbrook 1941, p. 83, pl. IV, fig. 3. Abattoirs Bore, Adelaide.

euglypha Mitra — *Balcomitra*
Tate 1889, p. 140, pl. V, fig. 13. Gippsland.

eusmilia Cerithium — *Eumetula*
Tenison Woods 1879b, p. 5, pl. I, fig. 9. Lower beds, Muddy Creek.

evanescens Actaeon — *Acteon*
Cossmann 1897, p. 4, pl. I, fig. 10, 11. Adelaide Bore, Kent Town.

evaricosus Typhis — *Siphonochelus*
Tate 1888, p. 94, pl. I, fig. 6. Lower beds, Muddy Creek.

exaltata Cancellaria — *Fusiaphera*
Tate 1889, p. 154, pl. VIII, fig. 10. Mornington.

exigua Cassis — *Hypocassis*

Tenison Woods 1879b, p. 17, pl. 2, fig. 7. Lower beds, Muddy Creek.

exigua Cylichna — *Cylichnania*

Tenison Woods 1879b, p. 19, pl. 2, fig. 6. Lower beds, Muddy Creek.

exigua Simnia (Neosimnia) — *Neosimnia (Pellasimnia)*

Tate 1890, p. 218. 1892, pl. ix, fig. 3, 3a. Lower beds, Muddy Creek.

exigua Thalotia — *Thalotia*

Tenison Woods 1879a, p. 235, pl. 20, fig. 11. Lower beds, Muddy Creek.

exilis Fasciolaria — *Brocchitas*

Type species of genus

Tate 1888, p. 149, pl. X, fig. 3. River Murray cliffs near Morgan.

exilis Mitra — = *Balcomitra macra* Finlay 1927

Tate 1889, p. 140, pl. VIII, fig. 5. non Reeve 1845. Lower beds, Muddy Creek.

eximia Cypraea — *Umbilia*

G. B. Sowerby I in Strzelecki 1845 p. 296, pl. XIX, fig. 1, 2, 3. Franklin's Village, Tasmania.

exsculpta Asperdaphne (Aspertilla) — *Aspertilla*

Powell 1944, p. 60, pl. 6, fig. 9. Abattoirs Bore 400-500 ft, Adelaide.

exsculpta Etrema — *Etrema*

Powell 1944, p. 54, pl. 5, fig. 4. Altona Bay.

exsculpta Rugobela — *Rugobela*

Powell 1944, p. 63, pl. 6, fig. 5. Upper beds, Torquay.

extenuatus Conus — *Mamiconus*

Tate 1890, p. 199. 1892, pl. viii, fig. 1. Lower beds, Muddy Creek; River Murray Cliffs near Morgan.

exuta Syntomodrillia (Hauturua) — *Hauturua*

Powell 1944, p. 34, pl. 2, fig. 13. Gippsland Lakes.

eyrei Murex — *Paziella*

Tenison Woods 1877, p. 93. Table Cape.

fallax Terebralia — *Thericium*

Ludbrook 1941, p. 91, pl. iv, fig. 21. Abattoirs Bore, Adelaide.

fanaticum Astele — *Astele*

Ludbrook 1941, p. 86, pl. iv, fig. 6. Abattoirs Bore, Adelaide.

fenestralis Colina — *Ischnocerithium*

Tate 1894, p. 180, pl. xi, fig. 11. Gellibrand River.

fenestrata Mitrithara — *Mitrithara*

Powell 1944, p. 44, pl. 1, fig. 14. Balcombe Bay.

fenestrata Trichotropis — *Sirius*

Tate 1890, p. 191. 1892, pl. xiii, fig. 7. Adelaide Bore, Kent Town.

flemingtonensis Cerithium — *?*

McCoy 1876a, p. 28, pl. XXVI, fig. 3-9. Flemington.

flindersii Astralium (Calcar) — *Astralium*

Tenison Woods 1877, p. 95. Table Cape.

gatliffi Natica — *Proxiuber*
Chapman & Crespin 1928, p. 112, pl. vii, fig. 42. Sorrento Bore 1107 ft.

gatliffi Voluta — *Pterospira*
Pritchard 1898, p. 108, pl. VIII, fig. 6. Lower beds, Muddy Creek.

gatliffiana Rissoa — *Scrobs*
Chapman & Gabriel 1914, p. 321, pl. XXVIII, fig. 30. Mallee Bore 10, 225-230 ft.

geelongensis Collonia — *Collinista*
Pritchard 1904, p. 330, pl. XVIII, fig. 8, 9. Batesford.

gellibrandensis Gemmula — *Gemmula*
Chapple 1934, p. 163, pl. XIX, fig. 3, 3a. ¾ mile W. of Princetown.

gemmata Lyria — *Harpella*
Tate 1889, p. 118, pl. III, fig. 4. Upper beds, Muddy Creek.

gemmata Montfortula — *Montfortula*
Chapman & Gabriel 1923, p. 32, pl. II, fig. 22-24. Balcombe Bay.

gemmulata Turritella — *Ctenocolpus*
Tate 1893, p. 338, pl. VIII, fig. 11. Lower beds, Muddy Creek.

gemmulatus Triton — *Cymatiella*
Tate 1888, p. 126, pl. VI, fig. 8. Lower beds, Muddy Creek.

geniculata Terebra — *Noditerebra*
Type species of genus
Tate 1886a, p. 6. 1889, p. 161, pl. ix, fig. 8. Upper beds, Muddy Creek.

gibbuloides Solarium (Torinia) — *Antisolarium*
Tenison Woods 1877, p. 97. Table Cape.

gibbus Triton — *Austrotriton*
Tate 1888, p. 118, pl. V, fig. 9. Mornington.

gigas Cypraea — *Gigantocypraea*
Type species of genus
McCoy 1867, p. 438. 1875c, p. 19, pl. xv; pl. xvi, fig. 2; pl. xvii; pl. xviii, fig. 1. Lower beds, Muddy Creek.

gilli Tylospira (Singletonaria) — *Singletonaria*
Marwick 1960, p. 41, fig. 1a, b. Lime Quarry, foot of Dutchman, Flinders Is.

gippslandensis Etrema — *Etrema*
Powell 1944, p. 54, pl. 5, fig. 2. Gippsland Lakes.

gippslandensis Pseudoinquisitor — *Inquisitor*
Powell 1944, p. 28, pl. 3, fig. 5. Gippsland Lakes.

gippslandicus Fusus — *Fusinus*
Tate 1888, p. 140. 1889, p. 116, pl. iii, fig. 6. Bairnsdale.

glaessneri Marginella (Eratoidea) — *Austroginella*
Ludbrook 1958, p. 78, pl. 3, fig. 11. Hindmarsh Bore 450-487 ft.

glaber Austroclavus — *Austroclavus*
Powell 1944, p. 40, pl. 2, fig. 1. Balcombe Bay.

glabra Mangilia (Cythara) — *Eucithara*
Harris 1897, p. 58, pl. III, fig. 10 a-b. Upper beds, Muddy Creek.

fictilis Calthalotia — *Calthalotia*
Ludbrook 1941, p. 84, pl. IV, fig. 14. Abattoirs Bore, Adelaide.

finlayi Guraleus (Paraguraleus) — *Antiguraleus*
Powell 1944, p. 50, pl. 5, fig. 12. Upper beds, Torquay.

fodinalis Mitra — *Eumitra*
Tate 1899a, p. 108. Dry Creek Bore; Croydon Bore, Adelaide.

foliaceus Fusus — *Serratifusus*
Tate 1888, p. 132, pl. VII, fig. 10. Lower beds, Muddy Creek.

foliosa Scalaria (Circuloscala) — *Circuloscala*
Tate 1890, p. 226. 1892, pl. xi, fig. 4. Mornington.

fontinalis Eutrochus — *Eurytrochus*
Pritchard 1904, p. 333, pl. XIX, fig. 9. Bird Rock Bluff.

fontinalis Genotia — *Micantapex*
Tate 1894, p. 175, pl. X, fig. 4. Spring Creek.

formosa Splendrillia — *Splendrillia*
Powell 1944, p. 31, pl. 2, fig. 5. Lower beds, Muddy Creek.

fossilis Atlanta — *Atlanta*
Tate 1898, p. 407, pl. 19, fig. 7. Cape Otway.

fragile Buccinum — *Atkinsonella*
Type species of genus, both names are preoccupied.
Tenison Woods 1877, p. 107. Table Cape.

frankstonensis Umbilia (Umbilia) brevis — *Umbilia*
Schilder 1935, p. 344. Grice Creek.

fulgetroides Voluta — *Ericusa*
Pritchard 1898, p. 105, pl. VII, fig. 4. Upper beds, Muddy Creek.

funicalis Vermicularia — *Vermicularia*
Crespin 1926, p. 120, pl. IX, fig. 19-21. Gellibrand River.

funiculatus Fusus = *Columbella woodsi* Pritchard 1904
Tenison Woods 1879a, p. 225, pl. 20, fig. 1. non Reeve 1846. Lower beds, Muddy Creek.

funiculifer Actaeon — *Acteon*
Cossmann 1897, p. 2, pl. I, fig. 4, 5. Upper beds, Muddy Creek.

fusilla Fasciolaria — *Fasciolaria*
Tate 1889, p. 116, pl. VI, fig. 12. Lower beds, Muddy Creek.

gabrieli Cypraea — *Gigantocypraea*
Chapman 1912c, p. 190, pl. XIII. Bird Rock Cliffs.

gabrieli Haurakia — *Haurakia*
Chapman & Crespin 1928, p. 113, pl. vii, fig. 43. Sorrento Bore 1446 ft.

gastroplax Cypraea (Aricia) — *Palliocypraea*
Type species of genus
McCoy 1867, p. 194. 1875c, p. 20, pl. XVI, fig. 1, pl. XVII, XVIII(fig. 2. Balcombe Bay.

gatliffi Murex (Muricidea) — *?*
Chapman 1922, p. 13, pl. iii, fig. 19. Balcombe Bay.

globiformis Marginella — *Microginella*
Chapman & Crespin 1928, p. 120, pl. IX, fig. 56. Mitchell River.

glyphospira Scalaria (Acrilla) — *Mammiscala*
Tate 1890, p. 233. 1892, pl. x, fig. 3. Lower beds, Muddy Creek.

gonioides Scalaria (Acrilla) — *Mammiscala*
Tate 1890, p. 233. 1892, pl. xii, fig. 7. Lower beds, Muddy Creek.

gracililirata Mangelia — *Retizafra*
Tenison Woods 1877, p. 106. Table Cape.

gracilior Notoluponia — *Notoluponia*
Schilder 1935, p. 349, fig. 42. Lower beds, Muddy Creek.

gracillima Daphnella — *Teleochilus*
Type species of genus
Tenison Woods 1877, p. 106. Table Cape.

gracillimus Fusus — *Microcolus*
Tenison Woods 1876, p. 22. Table Cape.

gradata Cancellaria = *Aneurystoma tatei* Cossmann 1899
Tate 1889, p. 155, pl. X, fig. 12. non Hoernes 1856. Lower beds, Muddy Creek.

gradata Cassidaria — *Galeodea*
Tate 1889, p. 169, pl. VIII, fig. 1. Mornington.

grandis Natica substolida — *Austrocochlis*
Chapman 1920, p. 239. Ooldea.

grangensis Turbo — *Subninella*
nom. nov. for *T. hamiltonensis* Pritchard 1904 non Harris 1897. Pritchard 1906, p. 117.

graniformis Murex (Muricopsis) — *Paziella*
nom. nov. for *Murex (Ocinebra) alveolatus* Tate 1888 non J. de C. Sowerby 1823, Harris 1897, p. 180.

granolirata Etrema — *Etrema*
Powell 1944, p. 52, pl. 5, fig. 3. Balcombe Bay.

granti Pleurotoma — *Apiotoma*
Pritchard 1904, p. 336, pl. XIX, fig. 3. Lower beds, Muddy Creek.

granulosa Daphnella — *Guraleus*
Chapman & Crespin 1933, p. 73, pl. V, fig. 13. Gippsland Lakes.

gregsoni Phos — *Phos*
Tate 1888, p. 168. 1889, p. 118, pl. iv, fig. 5. Jemmy Pt; Cunninghame.

gunyongensis Cocculina — *Cocculinella*
Chapman & Gabriel 1923, p. 26, pl. 1, fig. 9, 10. Grice Creek.

hainsworthii Crepidula — *Zeacrypta*
Johnston 1885c, p. 233, fig. Table Cape.

halli Trophon — *Litozamia*
Chapman & Crespin 1928, p. 119, pl. VIII, fig. 53. Sorrento Bore, 1107 ft.

halli Voluta — *Mesericusa*
Pritchard 1896, p. 101, pl. II, fig. 1, 2, 3. Spring Creek.

hamiltonensis Conus — *Conus*
Tate 1890, p. 200. 1892, pl. viii, fig. 3. Lower beds, Muddy Creek.

hamiltonensis Murex — *Xenotrophon*
Tate 1888, p. 101, pl. III, fig. 6. Lower beds, Muddy Creek.

hamiltonensis Natica wintlei — *Tanea*
Tenison Woods 1879a, p. 229, pl. 21, fig. 8. Lower beds, Muddy Creek.

hamiltonensis Patelloida — *Patellanax*
Chapman & Gabriel 1923, p. 24, pl. 1, fig. 3. Upper beds, Muddy Creek.

hamiltonensis Scalaria (Nodiscala) — *Hirtoscala*
Tate 1890, p. 225. 1892, pl. x, fig. 5. Lower beds, Muddy Creek.

hamiltonensis Turbo — *Euninella*
Harris 1897, p. 274, pl. VIII, fig. 3 a-c. Lower beds, Muddy Creek.

hamiltonensis Turbo = *Turbo grangensis* Pritchard 1906
Pritchard 1904, p. 329, pl. XIX, fig. 4. non Harris 1897. Upper beds, Grange Burn.

hamiltonensis Voluta — *Ericusa*
Pritchard 1898, p. 107, pl. VIII, fig. 5. Lower beds, Muddy Creek.

hannafordi Voluta — *Pterospira*
Type species of genus
McCoy 1866a, p. 376. 1874, p. 23, pl. vi, fig. 1. Foot of Mt. Eliza (Grice Creek).

haroldi Scrinium — *Scrinium*
Powell 1944, p. 45, pl. 1, fig. 10. Upper beds, Torquay.

harpularia Lyria — *Harpella*
Tate 1888, p. 176, pl. 12, fig. 12. 1889, p. 118. Lower beds, Muddy Creek.

harrisi Guraleus — *Guraleus*
Powell 1944, p. 48, pl. 6, fig. 15. Lower beds, Muddy Creek.

harrisi Ranella — *Biplex*
Cossmann 1903, p. 201, pl. 4, fig. 11. Lower beds, Muddy Creek.

hemiothone Columbella — *?*
Tenison Woods 1879b, p. 14, pl. 3, fig. 8. Lower beds, Muddy Creek.

hemipsila Puncturella — *Vacerrena*
Tate 1898, p. 406, pl. 20, fig. 8 a, b. Table Cape.

henicus Fusus — *Fusinus*
Tate 1889, p. 116, pl. VI, fig. 11. Lower beds, Muddy Creek.

hentyi Cellana — *Cellana*
Chapman & Gabriel 1923, p. 23, pl. 1, fig. 2. Forsyth's Grange Burn.

heptagonalis Voluta — *Pterospira*
Tate 1889, p. 121, pl. IV, fig. 1 & 7. River Murray Cliffs near Morgan.

hesperus Astraea (Bellastraea) — *Bellastraea*
Ludbrook 1956, p. 23, pl. 2, fig. 8. Abattoirs Bore, Adelaide.

heterospira Conus — *Conus*
Tate 1890, p. 197. 1892, pl. VII, fig. 5, 5a. Mornington, Bird Rock Bluff.

hexagonalis Fusus — *Solutofusus*
Tate 1888, p. 139, pl. III, fig. 15 a, b. Lower beds, Muddy Creek.

hordeacea Marginella — *Marginella*
Tate 1878, p. 91. Upper beds, Aldinga.

howchini Pelicaria — *Tylospira*
Cotton 1934, p. 7, fig. Brooklyn Park Bore, Adelaide.

howitti Bankivia — *Bankivia*
Pritchard 1904, p. 334, pl. XVIII, fig. 1. Jemmy Point, Kalimna.

hudsoniana Imperator — *Astraea*
Johnston 1888, pl. XXIX, fig. 12, 12a. Table Cape.

hypsellus Trophon — *Zeatrophon*
Tate 1888, p. 111, pl. II, fig. 1. Adelaide Bore, Kent Town.

icosiphyllus Trophon — *Gemixystus*
Tate 1888, p. 110, pl. II, fig. 3. Adelaide Bore, Kent Town.

illota Erato (Eratopsis) — *Sulcerato*
Type species of genus
Tate 1890, p. 217. 1892, pl. xiii, fig. 11. Upper beds, Muddy Creek.

imparigranosa Delphinula — ?
Pritchard 1896, p. 121, pl. III, fig. 8, 9. Table Cape.

incisus Guraleus (Paraguraleus) — *Antiguraleus*
Powell 1944, p. 51, pl. 5, fig. 14. Abattoirs Bore 400-500 ft, Adelaide.

incola Gena — *Gena*
Cotton 1947, p. 666, pl. XXI, fig. 13, 14. Salisbury Bore 350 ft.

incommoda Mereldia — *Mereldia*
Type species of genus
Ludbrook 1941, p. 92, pl. V, fig. 3. Abattoirs Bore, Adelaide.

incommoda Volvarina (?) — *Volvarina*
Ludbrook 1958, p. 84, pl. 3, fig. 15. Abattoirs Bore, Adelaide.

incompositus Fusus — *Austrolithes*
Tate 1888, p. 137, pl. III, fig. 9. Lower beds, Aldinga.

indivisa Voluta anticingulata — *Ternivoluta*
McCoy 1866a, p. 380. 1874, p. 25. A[d] 22. Bird Rock Cliffs, Torquay.

inermis Marginella — *Conuginella*
Tate 1878, p. 93. Muddy Creek.

inexpectata Austrotoma — *Austrotoma*
Powell 1944, p. 23, pl. 7, fig. 6, 7. Table Cape.

inexpectata Zemacies — *Zemacies*
Powell 1944, p. 21, pl. 7, fig. 8. Lower beds, Torquay.

inflatior Volvulella — *Rhizorus*
Cossmann 1897, p. 9, pl. 1, fig. 24, 25. Spring Creek.

infortunatum Tugali — *Tugali*
Ludbrook 1941, p. 82, pl. IV, fig. 1. Abattoirs Bore, Adelaide.

infundibulata Bullinella *Cylichna*
Cossmann 1897, p. 14, pl. II, fig. 15, 16. Gellibrand River.

ino Fusus *Dennantia*
Type species of genus
Tenison Woods 1879b, p. 13, pl. 3, fig. 10. Lower beds, Muddy Creek.

inornata Scalaria (Acrilla) *Mammiscala*
Tate 1890, p. 232. 1892, pl. x, fig. 6. Table Cape.

insolentior Ademitrella *Ademitrella*
Type species of genus
Ludbrook 1941, p.96, pl. V, fig. 11. Abattoirs Bore, Adelaide.

integra Drillia *Integradrillia*
Type species of genus
Tenison Woods 1879b, p. 11, pl. 3, fig. 4. Lower beds, Muddy Creek.

intercostalis Triton *Ranella*
Tate 1888, p. 121, pl. IX, fig. 5. Lower beds, Muddy Creek.

interlineata Peristernia *Streptopelma*
Tate 1888, p. 159, pl. VI, fig. 1. Lower beds, Muddy Creek.

interlineata Trichotropis *Sirius*
Tate 1890, p. 190. 1892, pl. xiii, fig. 2. Adelaide Bore, Kent Town.

intermedia Voluta weldii *Pseudocymbiola*
Pritchard 1913, p. 193, pl. XX, fig. 2, 3. Lower beds, Muddy Creek.

interposita Distortio *Distortio (Personella)*
Tate 1894, p. 172, pl. X, fig. 3. Bird Rock Bluff.

interstriata Scalaria (Clathrus) *Striatiscala*
Tate 1890, p. 224. 1892, pl. x, fig. 1. Lower beds, Muddy Creek.

intertexta Liratomina *Liratomina*
Powell 1944, p. 26, pl. 7, fig. 4. Upper beds, Torquay.

intumescens Mauidrillia *Mauidrillia*
Powell 1944, p. 37, pl. 4, fig. 4. Gippsland Lakes.

involuta Tornatina *?*
Tenison Woods 1879a, p. 239, pl. 21, fig. 4. Muddy Creek.

iredalei Ellatrivia *Ellatrivia*
Schilder 1935, p. 334, fig. 12. Lower beds, Muddy Creek.

irregularis Murex = *Hadriania basedowi* Cossmann 1903
Tate 1888, p. 102, pl. VI, fig. 3. non Bellardi 1872. Lower beds, Muddy Creek.

janjukiensis Anacithara *Anacithara*
Powell 1944, p. 58, pl. 5, fig. 10. Table Cape.

janjukiensis Austrotoma *Austrotoma*
Powell 1944, p. 24, pl. 3, fig. 1. Upper beds, Torquay.

janjukiensis Etrema *Etrema*
Powell 1944, p. 52, pl. 5, fig. 1. Table Cape.

janjukiensis Guraleus *Guraleus*
Powell 1944, p. 47, pl. 4, fig. 2. Upper beds, Torquay.

janjukiensis Turris — *Apiotoma*
Chapple 1934, p. 163, pl. XIX, fig. 2, 2a. Bird Rock Cliffs.

jejuna Pellax — *Pellax*
Ludbrook 1956, p. 24, pl. 2, fig. 9. Weymouth Bore 310-330 ft, Adelaide.

johnstoni Australium (Imperator) — *Astraea*
Pritchard 1896, p. 116. Keilor; Royal Park.

johnstonii Fusus — *Brocchitas*
Tenison Woods 1877, p. 94. Table Cape.

johnstonii Pleurotoma — *Insolentia*
Tenison Woods 1877, p. 105. Table Cape.

johnstoni Rissoina — *Morchiella*
Tenison Woods 1877, p. 101. Table Cape.

johnstoni Vespertilio — Invalid name change
nom. nov. for *Voluta strombiformis* Johnston (non-existent) non Deshayes 1835 Cossmann 1899a, p. 119.

johnstoniana Leiostraca — *?*
Tate 1885b, p. 227. Table Cape; River Murray Cliffs near Morgan; Muddy Creek.

jonesiana Cypraea — *Notocypraea*
Tate 1890, p. 205. 1892, pl. VI, fig. 2. Upper beds, Muddy Creek; Dry Creek Bore.

jonesiana Odontostomia — *Agatha*
Tate 1898b, p. 70. 1898c, p. 83, Text fig. Tintinarra Bore, 26-154 ft.

josephi Trochus — *?*
Tenison Woods 1877, p. 97, Table Cape.

jutsoni Cellana — *Cellana*
Chapman & Crespin 1934, p. 122, pl. XI, fig. 28. Albany.

kalimnae Calyptraea — *Calyptraea*
Chapman & Gabriel 1914, p. 320, pl. XXVIII, fig. 28 a-c, 29. Gippsland Lakes.

kalimnae Marginella — *Volvarinella*
Chapman & Crespin 1933, p. 73, pl. V, fig. 12. Bore No. 1, Parish of Bumberrah, 80-90 ft, Metung.

kekwickii Margarita — *Spectamen*
Tenison Woods 1877, p. 97. Table Cape.

kimberi Niso — *Niso*
Pritchard 1906, p. 119. Lower beds, Aldinga.

kitsoni Marginella — *Lataginella*
Chapman 1921, p. 321, pl. LI, fig. 4. Fishing Point.

labrosus Sipho — *Varicosipho*
Type species of genus
Tate 1888, p. 144, pl. iii, fig. 7. Lower beds, Muddy Creek.

laciniatus Typhis — *Typhina*
Tate 1888, p. 93, pl. 1, fig. 10. Lower beds, Muddy Creek.

lactea Ringicula *Ringicula*
Johnston 1880, p. 34. Table Cape.

laevis Adeorbis *Cirsonella*
Johnston 1880, p. 33. Table Cape.

laevis Pleurotoma selwyni = *Epideira selwyni suppressa* Finlay 1927
Pritchard 1904, p. 328, pl. XIX, fig. 2. non Hutton 1873. Lower beds, Muddy Creek.

lamellifera Harpa *Eocithara*
Tate 1889, p. 149, pl. VI, fig. 2. Lower beds, Muddy Creek.

lamellifera Siphonalia *Austrosipho*
Tate 1888, p. 142, pl. VIII, fig. 5. Mornington.

lamellosa Liotia *Munditia*
Tenison Woods 1877, p. 96. Table Cape.

lampra Scalaria (Hemiacirsa) *Notacirsa*
Tate 1890, p. 234. 1892, pl. XI, fig. 8. Lower beds, Blanche Pt.

lanceolata Ancillaria *Baryspira*
Tate 1889, p. 147, pl. VII, fig. 2. Lower beds, Muddy Creek.

laqueata Fissurellidea *Cosmetalepas*
Tate 1885, p. 1. Mornington.

latecarina Calliostoma *Calliostoma*
Pritchard 1896, p. 120, pl. III, fig. 10, 11. Table Cape.

laticostata Cancellaria *Gergovia*
Type species of genus
Tenison Woods 1879b, p. 17, pl. 2, fig. 8. Lower beds Muddy Creek.

latissima Turritella *Maoricolpus*
Cotton & Woods 1935, p. 372, fig. 6. Table Cape.

latesulcatum Infundibulum *Infundibulum*
Tate 1898a, p. 404, pl. 20, fig. 10. Table Cape.

lauta Crossea *Dolicrossea*
Tate 1890, p. 222. 1892, pl. VIII, fig. 4, 4a. Upper beds, Muddy Creek.

laxegemmatus Phasianotrochus *Phasianotrochus*
Ludbrook 1941, p. 83, pl. IV, fig. 4. Abattoirs Bore, Adelaide.

legrandi Murex *Paziella*
Johnston 1880, p. 32. Table Cape.

leptalea Mitra *Balcomitra*
Tate 1889, p. 140, pl. V, fig. 3. Lower beds, Muddy Creek.

leptalea Scalaria (Acrilla) *Acrilla*
Tate 1893, p. 317, pl. X, fig. 1. Lake Bullenmerri near Camperdown.

leptorhyncha Cypraea (Luponia) *Rhynchocypraea*
McCoy 1877, p. 35, pl. XLIX, fig. 1. Foot Mt. Eliza & Mt. Martha (Balcombe Bay).

leptoskeles Epidromus *Ratifusus*
Tate 1888, p. 129, pl. IV, fig. 10. Lower beds, Muddy Creek.

leptospira Terebra — *Acuminia*
Tate 1889, p. 163, pl. VIII, fig. 15 a, b. Lower beds, Muddy Creek.

levior Voluta antiscalaris — *Ternivoluta*
McCoy 1866a, p. 379. McCoy 1874, p. 28. Mt. Martha (Balcombe Bay).

ligata Ancillaria — *Baryspira (Gracilispira)*
Tate 1889, p. 147, pl. VII, fig. 6. Adelaide Bore, Kent Town.

ligata Mitra = *Microvoluta pentaploca* Finlay 1927
Tate 1889, p. 139, pl. V, fig. 4. non A. Adams 1853. Mornington.

ligata Triploca — *Triploca*
Type species of genus
Tate 1894, p. 186, pl. XI, fig. 7. Adelaide Bore, Kent Town.

ligatus Conus — *Conus*
Tate 1890, p. 196. 1892, pl. VII, fig. 4, 4 a, b; pl. VIII, fig. 9. Lower beds, Muddy Creek, Mornington.

limata Natica — *Globisinum*
Tate 1893, p. 324, pl. X, fig. 4. Lower beds, Muddy Creek.

limbata Voluta (Volutoconus) — *Volutoconus*
Tate 1888, p. 176, pl. XIII, fig. 8. 1889, p. 125. Mornington (Type loc., probably Grice Creek).

lintea Peristernia — *Streptopelma*
Type species of genus
Tate 1888, p. 157, pl. VIII, fig. 11. Lower beds, Muddy Creek.

lintea Voluta — *Notovoluta*
Tate 1889, p. 129, pl. III, fig. 1 a, b. River Murray Cliffs near Morgan.

liraecostata Turbonilla — *Pyrgiscus*
Tenison Woods 1877, p. 101. Table Cape.

lirasuturalis Manulona — *Manulona*
Ludbrook 1941, p. 91, pl. IV, fig. 27. Abattoirs Bore, Adelaide.

lirata Struthiolaria — *Singletonaria*
Type species of genus
Tate 1889, p. 169, pl. X, fig. 11. Jemmy Pt.

lirata Voluta — *Notopeplum saginatum*
Johnston 1880, p. 37. non Brocchi 1814. Table Cape.

liratus Obtortio — *Obtortio*
Ludbrook 1941, p. 90, pl. IV, fig. 24. Abattoirs Bore, Adelaide.

longiconica Eulima — *Margineulima*
Ludbrook 1941, p. 93, pl. V, fig. 4. Abattoirs Bore, Adelaide.

longirostris Siphonalia — *Austrosipho*
Tate 1888, p. 143, pl. XI, fig. 8. Mornington.

longispira Tornatina — *Acteocina*
Cossmann 1897, p. 7, pl. I, fig. 18, 19. Upper beds, Muddy Creek.

longispira Voluta strophodon
Pritchard 1913, p. 194 (McCoy 1876b, p. 26, pl. 37, fig. 4, 4a, b.) Ad 28, Fyansford.

longisulcata Ellatrivia — *Ellatrivia*
Schilder 1932a, p. 256, fig. 1. Lower beds, Muddy Creek.

lophoessus Murex — *Torvamurex*
Tate 1888, p. 98, pl. II, fig. 5. Mornington.

loxopleura Scalaria (Punctiscala) — *Punctiscala*
Tate 1890, p. 227. 1892, pl. XI, fig. 5. Adelaide Bore, Kent Town.

ludbrookae Filodrillia — *Filodrillia*
Powell 1944, p. 57, pl. 5, fig. 9. Abattoirs Bore 400-500 ft, Adelaide.

ludbrookae Guraleus — *Guraleus*
Powell 1944, p. 47, pl. 4, fig. 3. Abattoirs Bore 400-500 ft, Adelaide.

ludbrookae Laevityphis (Laevityphis) — *Laevityphis*
nom. nov. for *Typhis tripterus* Tate 1888 non Grateloup 1833. Keen & Campbell 1964, p. 52, pl. 10, fig. 33, 34, 36.

ludbrookae Syntomodrillia — *Syntomodrillia*
Powell 1944, p. 34, pl. 2, fig. 10. Abattoirs Bore 400-500 ft, Adelaide.

ludbrookae Tomopleura — *Tomopleura*
Powell 1944, p. 38, pl. 2, fig. 14. Abattoirs Bore 400-500 ft, Adelaide.

lygdinopsis Austroclavus — *Austroclavus*
Powell 1944, p. 41, pl. 2, fig. 4. Lower beds, Muddy Creek.

lyraecostata Cominella — *Phos*
Tenison Woods 1877, p. 108. Table Cape.

maccoyi Argobuccinum — *Biplex*
Pritchard 1898, p. 99. (Tate 1888, p. 115, pl. 6, fig. 6). Lower beds, Muddy Creek.

maccoyi Typhis — *Typhis*
Tenison Woods 1876, p. 22, fig. 5. Table Cape.

maccoyi Voluta — *Notopeplum*
Tenison Woods 1877, p. 95. Table Cape.

maccoyi Umbilia (Umbilia) eximia — *Umbilia*
Schilder 1932b, p. 183 (Type designated herein. McCoy 1876a, pl. xxviii, fig. 2, 2b). Grice Greek.

macdonaldi Voluta — *Aulicina*
Tate 1888, p. 176, pl. XII, fig. 11. 1889, p. 123, pl. III, fig. 5. Mornington.

macra Balcomitra — *Balcomitra*
nom. nov. for *Mitra exilis* Tate 1889 non Reeve 1845. Finlay 1927b, p. 508.

macrocephala Scaphella — *Amoria*
nom. nov. for *Voluta capitata* Tate 1889 non Perry 1811. Finlay 1927b, p. 513.

macroptera Voluta — *Pterospira*
McCoy 1866a, p. 375, 1874, p. 29, pl. VII, fig. 1-4. Ad 22, Bird Rock, Torquay.

makros Trophon (Enatimene) — *Enatimene*
Chapple 1941, p. 122, pl. XIV, fig. 6. ¾ mile W. of Princetown.

mala Marginella — *Marginella*
Cotton 1949b, p. 215, pl. XVIII. Lower beds. Aldinga.

malleata Fissurellidea — *Cosmetalepas*
Tate 1882, p. 46. River Murray Cliffs; Muddy Creek; Kent Town Bore.

mangelioides Trophon — *Etrema*
Tate 1888, p. 112, pl. X, fig. 11. River Murray Cliffs near Morgan.

manubriatus Murex — *Pterochelus*
Tate 1888, p. 96, pl. 1, fig. 9. Adelaide Bore, Kent Town.

mappingae Turbonilla (Chemnitzia) — *Chemnitzia*
Ludbrook 1957, p. 43, pl. 3, fig. 11. Weymouth Bore 310-330 ft, Adelaide.

marginata Thala — *Rugobela columbelloides*
Tenison Woods 1877, p. 108. Table Cape.

mariae Caloscala — *Cirsotrema*
Type species of *Caloscala*
Tate 1885a, p. 3. 1892, pl. XII, fig. 2. Lower beds, Aldinga.

marwicki Pelicaria — *Tylospira*
Finlay 1931, p. 17. 400-500 ft, Abattoirs Bore, Adelaide.

masoni Voluta — *Amorena*
Tate 1889, p. 128, pl. III, fig. 9. Upper beds, Muddy Creek.

matronalis Mappingia — *Mappingia*
Ludbrook 1958, p. 93, pl. 5, fig. 15. Hindmarsh Bore 450-487 ft.

maudensis Emarginula — *Emarginula*
Chapman & Gabriel 1923, p. 28, pl. II, fig. 1; pl. III, fig. 33. Maude.

mawsoni Austromitra — *Austromitra*
Ludbrook 1958, p. 69, pl. 3, fig. 6. Weymouth Bore 310-330 ft, Adelaide.

medioplicatilis Turritella — *Colpospira*
Chapman & Crespin 1928, p. 116, pl. VIII, fig. 47. Sorrento Bore 1461 ft.

megale Mitrithara — *Mitrithara*
Chapple 1941, p. 121, pl. XIV, fig. 2. 2½ miles W. of Gellibrand River.

meredithae Fusus — *Fusinus*
Tenison Woods 1876, Explanation of pl., fig. VI. Table Cape.

merultum Adelacerithium — *Adelacerithium*
Type species of genus
Ludbrook 1941, p. 90, pl. IV, fig. 23. Abattoirs Bore, Adelaide.

meta Marginella — *Volvarinella*
Cotton 1949b, p. 213, pl. XVIII. Bore 21, S.A. Mines Dept. 400 ft.

metula Marginella — *Dentiginella*
Cotton 1949b, p. 214, pl. 18. Bore 21, S.A. Mines Dept. 400 ft.

metungensis Trophon (Enatimene) — *Enatimene*
Chapman & Crespin 1933, p. 71, pl. V, fig. 9. Bore No. 1. Parish of Bumberrah 90-100 ft, Metung.

micra Cancellaria — *Anapepta*
Tate 1889, p. 158, pl. X, fig. 8. Adelaide Bore, Kent Town.

microlirata Odostomia — ?
Johnston 1885a, p. 223. Table Cape.

micronema Leucozonia — *Latirolagena*
Tate 1888, p. 162, pl. IX, fig. 12. Mornington.

microplocus Semiactaeon — *Semiactaeon*
Cossmann 1897, p. 5, pl. 1, fig. 14, 15. River Murray Cliffs.

microrhysa Scalaria (Punctiscala) — *Punctiscala*
Tate 1890, p. 229. 1892, pl. viii, fig. 2. Bird Rock Bluff.

microsculptum Proxiuber — *Proxiuber*
Ludbrook 1958, p. 49, pl. 1, fig. 15, 16. Weymouth Bore 310-330 ft, Adelaide.

microstira Sigaretus — *Ectosinum*
Tate 1893, p. 328, pl. VII, fig. 10. Bird Rock Bluff.

micula Marginella — *Protoginella*
Tate 1878, p. 93. Muddy Creek.

millegranosa Astele — *Astele*
Pritchard 1904, p. 332, pl. XIX, fig. 7, 8. Lower beds, Muddy Creek.

minima Trivia — *Ellatrivia*
Tenison Woods 1879b, p. 4, pl. 1, fig. 8, 8a. Lower beds, Muddy Creek.

minimum Triton — *Austrosassia tortirostris*
Tenison Woods 1877, p. 107. non Hutton 1873. Table Cape.

minor Erato — *Proterato*
Tate 1878, p. 96. 1892, pl. xiii, fig. 10, 10a. Lower beds, Muddy Creek.

minuticonica Eulima — *Margineulima*
Ludbrook 1941, p. 93, pl. V, fig. 5. Abattoirs Bore, Adelaide.

minutus Murex
Johnston 1880, p. 32. Table Cape. — *?*

miocenica Heterocithara — *Heterocithara*
Powell 1944, p. 57, pl. 4, fig. 11. Balcombe Bay.

mirabilis Etrema — *Etrema*
Powell 1944, p. 54, pl. 5, fig. 5. Curdie's R. near Peterborough.

mirabilis Pseudovaricia — *Pseudovaricia*
Type species of genus
Tate 1888, p. 146, pl. VII, fig. 9 a-c. Lower beds, Muddy Creek.

mirulus Streblorhamphus — *Mirolacuna*
Type species of genus
Tate 1898a, p. 401, pl. 20, fig. 4. Lower beds, Muddy Creek.

mitchellensis Cerithiopsis — *Zaclys*
Chapman & Crespin 1928, p. 118, pl. viii, fig. 51. Mitchell River.

mitrellaeformis Terebra — *Nototerebra*
Tate 1886a, p. 7. 1889, p. 160, pl. ix, fig. 10. Upper beds, Aldinga.

moana Marginella — *Microginella*
Ludbrook 1941, p. 97, pl. V, fig. 15. Abattoirs Bore, Adelaide.

modestina Cancellaria — *Sydaphera*
Tate 1889, p. 157, pl. IX, fig. 4. Upper beds, Muddy Creek.

modestina Tasmatica — *Tasmatica*
Ludbrook 1958, p. 50, pl. 1, fig. 17, 18. Weymouth Bore 310-330 ft, Adelaide.

monoploca Mitra — Invalid name change
nom. nov. for *Mitra uniplica* Tate 1889 Finlay 1927b, p. 509.

monotropis Trophon — *Enatimene*
Tate 1888, p. 111, pl. III, fig. 4. Adelaide Bore, Kent Town.

montismarthae Umbilia (Umbilia) brevis — *Umbilia*
Schilder 1935, p. 344, fig. 29. Mt. Martha.

mooraboolensis Haliotis — *Marinauris*
McCoy 1876a, p. 25, pl. XXV, fig. 3-3b. Upper beds, Maude.

mooraboolensis Natica — *Austrococchlis*
Tate 1893, p. 323, pl. VI, fig. 5. Moorabool River near Maude.

morningtonensis Erato — *Archierato*
Tate 1890, p. 217. Mornington.

morningtonensis Etrema — *Etrema*
Chapple 1934, p. 164, pl. XIX, fig. 4, 4a. Balcombe Bay.

mortoni Voluta — *Pterospira*
Tate 1889, p. 124, pl. IX, fig. 1, 2. Table Cape.

morundiana Peristernia — *?*
Tate 1888, p. 154, pl. VIII, fig. 7. River Murray Cliffs near Morgan.

muelleri Semicassis — *Antephalium*
Tate 1889, p. 167, pl. VII, fig. 9. Upper beds, Muddy Creek.

mulderi Cerithiopsis — *Joculator*
Tate 1898a, p. 403. Fyansford.

mulderi Cypraea — *Zoila*
Tate 1892, pl. IX, fig. 4. 1893, p. 316. Belmont.

mulderi Turbonilla — *Turbonilla*
Chapman & Crespin 1928, p. 108, pl. VII, fig. 34. Corio Bay.

multicinctus Cantharidus — *Cantharidus*
Crespin 1926, p. 120, pl. IX, fig. 18. Green Gully, Keilor.

multicincturalis Turritella — *Gazameda*
Chapman and Crespin 1928, p. 116, pl. VIII, fig. 46. 741 ft, Sorrento Bore.

multiliratus Clypeomorus — *Zeacumantus*
Ludbrook 1941, p. 89, pl. IV, fig. 22. Abattoirs Bore, Adelaide.

multiplicata Austromitra — *Austromitra*
Ludbrook 1958, p. 71, pl. 3, fig. 8. Weymouth Bore 310-330 ft, Adelaide.

multiradialis Patelloida — *Actinoleuca*
Chapman and Gabriel 1923, p. 24, pl. I, fig. 4; pl. III, fig. 29. Clifton Bank, Muddy Creek.

multisulcata Mitra — *Eumitra*
Harris 1897, p. 120, pl. V, fig. 1a-d. Lower beds, Muddy Creek.

murndaliana Pleurotoma — *Lucerapex*
Tenison Woods 1879a, p. 226, pl. 20, fig. 5. Lower beds, Muddy Creek.

murraviana Cypraea — *Notoluponia*
Tate 1890, p. 207. 1892, pl. vi, fig. 6. River Murray Cliffs. Near Mt. Arapiles, Vic.

murravianus Conus — *Conus*
Tate 1890, p. 200. 1892, pl. vii, fig. 2. River Murray near Morgan.

murrayana Peristernia — *?*
Tate 1888, p. 155. 1889, p. 117, pl. iv, fig. 4. River Murray Cliffs near Morgan.

murrayana Pleurotoma — *Lucerapex*
Pritchard 1904, p. 335, pl. XIX, fig. 10. River Murray Cliffs near Morgan.

murrayana Torcula — *Maoricolpus*
Tate 1885b, p. 227, 1893, p. 340, pl. viii, fig. 3. River Murray Cliffs near Morgan.

muscarioides Marginella — *Austroginella*
Tate 1878, p. 91. Muddy Creek.

muscula Zemitrella — *Dentimitrella*
Ludbrook 1941, p. 96, pl. V, fig. 12. Abattoirs Bore, Adelaide.

mutica Scalaria (Acrilla) — *Mammiscala*
Tate 1890, p. 233, 1892, pl. xii, fig. 4. Lower beds, Muddy Creek.

mutica Terebra — *Pervicacia*
Tate 1889, p. 162, pl. x, fig. 1. Lower beds, Muddy Creek.

naevosoides Haliotis — *Notohaliotis*
McCoy 1876a, p. 27, pl. XXVI, fig. 1-2a. Flemington.

nanum Scrinium — *Scrinium*
Powell 1944, p. 45, pl. I, fig. 9. Upper beds, Torquay.

navicelloides Pileopsis — Nomen dubium
Johnston 1880, p. 39. Table Cape.

newtoni Conus (Leptoconus) — *Conus*
Harris 1897, p. 29, pl. II, fig. 3 a-d. Lower beds, Muddy Creek.

nitidissima Calthalotia — *Calthalotia*
Ludbrook 1941, p. 83, pl. IV, fig. 11. Abattoirs Bore, Adelaide.

nitidula Eulimella — *Eulimella*
Chapman & Crespin 1928, p. 111, pl. vii, fig. 39. Mitchell River.

nodulatus Epidromus — *Ratifusus*
Tate 1888, p. 128, pl. VI, fig. 11. Adelaide Bore, Kent Town.

nota Tugalia — *Tugali*
Cotton 1947, p. 665, pl. XXI, fig. 11, 12. Abattoirs Bore, Adelaide.

nullarboricum Potamides — *?*
Chapman & Crespin 1934, p. 123, pl. xi, fig. 31-33. Lower beds, Aldinga.

nutans Maoritomella — *Maoritomella*
Powell 1944, p. 39, pl. 2, fig. 15. Abattoirs Bore, 400-500 ft, Adelaide.

nymphalis Oliva — *Cupidoliva*
Tate 1889, p. 145, pl. VII, fig. 7. Bairnsdale, Jemmy Pt.; Cunninghame.

obdita Clathurella — *Etrema*
Harris 1897, p. 59, pl. III, fig. 11 a-b. Lower beds, Muddy Creek.

obesula Erato — *Archierato*
Chapman 1922, p. 12, pl. 3, fig. 18. Balcombe Bay.

obesus Streblorhamphus — *Mirolacuna*
Tate 1898a, p. 401, pl. 19, fig. 8. Mornington.

obliquicancellatus Laetifautor — *Laetifautor*
Ludbrook 1941, p. 84, pl. IV, fig. 7. Abattoirs Bore, Adelaide.

obliquecostata Pisania — *Zeapollia*
Tate 1888, p. 165, pl. IX, fig. 7. Upper beds, Muddy Creek.

oblongula Drillia — *Inquisitor*
Harris 1897, p. 56, pl. III, fig. 7 a-b. Lower beds, Muddy Creek.

obsoleta Mangilia — *Antiguraleus*
Harris 1897, p. 57, pl. III, fig. 9 a-b. Lower beds, Muddy Creek.

obsoleta Syntomodrillia — *Syntomodrillia*
Powell 1944, p. 33, pl. 2, fig. 11. Balcombe Bay.

occlusa Subemarginula — *Montfortia*
Tate 1898a, p. 405, pl. 20, fig. 9. Lower beds, Muddy Creek.

occlusus Tenagodus — *Tenagodus*
Tenison Woods 1877, p. 100. Table Cape.

octoplicata Marginella — *Topaginella*
Tenison Woods 1877, p. 109. Table Cape.

oligodontota Notoluponia — *Notoluponia*
Schilder 1935, p. 347, fig. 31. Grice Creek.

oligostirus Triton — *Cymatiella*
Tate 1888, p. 126, pl. VI, fig. 7. Adelaide Bore, Kent Town.

olivellaeformis Actaeopyramis — *Acteon*
Tate 1894, p. 181, pl. XI, fig. 2. Lower beds, Muddy Creek.

omissa Collonia — *Collonia*
Ludbrook 1956, p. 23, pl. 2, fig. 7. Abattoirs Bore, Adelaide.

opposita Etremopsis — *Etremopsis*
Powell 1944, p. 55, pl. 5, fig. 7. Altona Bay.

optata Pleurotoma — *Optoturris*
Type species of genus
Harris 1897, p. 44, pl. III, fig. 4 a-b. Hobson Bay.

ornatissimum Astralium (Calcar) — *Bellastrea*
Tenison Woods 1877, p. 96. Table Cape.

orycta Ancillaria — *Alocospira*
Tate 1889, p. 146, pl. X, fig. 5. Jemmy Pt.; Cunninghame.

orycta Scalaria (Circuloscala) — *Cirsotrema*
Tate 1890, p. 227. 1892, pl. x, fig. 2. Lower beds, Muddy Creek.

othone Mitra — *Waimatea*
Tenison Woods 1879b, p. 8, pl. 2, fig. 4. Lower beds, Muddy Creek.

otwayensis Borsonia — *Borsonia*
Tate 1898a, p. 394, pl. 19, fig. 4. Cape Otway.

otwayensis Collonia — *Collinista*
Pritchard 1904, p. 331, pl. XVIII, fig. 6, 7. Point Flinders.

otwayensis Murex (Triplex) — *Pterochelus*
Harris 1897, p. 177, pl. VI, fig. 5 a-d. Cape Otway.

ovinoides Haliotis — *Notohaliotis*
McCoy 1876a, p. 24, pl. XXV, fig. 2-2b. Upper beds, Maude.

ovoideus Triton — *Vernotriton*
Tate 1888, p. 122, pl. IX, fig. 4. Upper beds, Muddy Creek.

ovulatella Cypraea — *Willungia*
Tate 1890, p. 208. 1892, pl. vi, fig. 7, 7a. Adelaide Bore, Kent Town; Lower beds, Aldinga.

oxleyi Columbella — *Macrozafra*
Tenison Woods 1877, p. 111. Table Cape.

pachycheila Harpa — *Austroharpa*
Tate 1894, p. 173, pl. XI, fig. 5. Spring Creek, Torquay.

pachypleura Scalaria (Acrilla) = *Mammiscala ralphi* de Boury 1907
Tate 1890, p. 232. non Conrad 1841. 1892, pl. xii, fig. 3. Lower beds, Muddy Creek.

pachyptycha Tornatina — *Acteocina*
Cossmann 1897, p. 6, pl. 1, fig. 20, 21. Upper beds, Muddy Creek.

pachystirus Murex — *?*
Tate 1888, p. 102, pl. II, fig. 11. Murray River Cliffs near Morgan.

pagoda Mathilda — *Orthochetus*
Chapman & Crespin 1934, p. 122, pl. xi, fig. 29,30. Lower beds, Aldinga.

pagoda Turbonilla — *?*
Tenison Woods 1877, p. 101. Table Cape.

pagodoides Voluta — *Notovoluta*
Tate 1888, p. 176, pl. xiii, fig. 7. 1889, p. 132. Lower beds, Aldinga.

pagodula Turritella — *Ctenocolpus*
Tate 1893, p. 336, pl. VIII, fig. 10. Gippsland Lakes.

palla Marginella — *Cassaginella*
Cotton 1949b, p. 215, pl. XVIII. Adelaide Bore, Kent Town.

papillata Ancillaria — *Alocospira*
Type species of genus
Tate 1889, p. 146, pl. VII, fig. 4. Upper beds, Muddy Creek.

paracantha Pleurotoma — *Optoturris*
Tenison Woods 1877, p. 105. Table Cape.

parallela Cypraea — *Austrocypraea*
Tate 1890, p. 203. 1892, pl. V, fig. 1. Lower beds, Muddy Creek.

parri Micantapex — *Micantapex*
Powell 1944, p. 15, pl. 7, fig. 2. Altona Shaft.

partinoda Mauidrillia — *Mauidrillia*
Powell 1944, p. 35, pl. 4, fig. 5. Balcombe Bay.

partisculpta Damoniella — *Damoniella*
Ludbrook 1958, p. 106, pl. 6, fig. 14. Weymouth Bore 310-330 ft, Adelaide.

parvula Crossea — *Collonia*
Tenison Woods 1879b, p. 4, pl. 1, fig. 7. Lower beds, Muddy Creek.

paucicostata Mitra — *Balcomitra*
Type species of genus
Tate 1889, p. 141, pl. V, fig. 2. Upper beds, Muddy Creek.

paucilineata Bullinella — *Cylichnania*
Cossmann 1897, p. 12, pl. 1, fig. 28-30. Spring Creek.

pauciplicata Austromitra — *Austromitra*
Ludbrook 1958, p. 70, pl. 3, fig. 7. Abattoirs Bore, Adelaide.

pellita Voluta — *Mesericusa*
Johnston 1880, p. 36. Table Cape.

pentaploca Microvoluta — *Microvoluta*
nom. nov. for *Mitra ligata* Tate 1889 non A. Adams 1853. Finlay 1927b, p. 508.

pera Marginella — *Kogomea*
Cotton 1949b, p. 215, pl. XVII. Lower beds, Muddy Creek.

peramangus Murex — *Trunculariopsis*
Ludbrook 1941, p. 95, pl. V, fig. 24. Abattoirs Bore, Adelaide.

peramoena Etrema — *Filodrillia*
Ludbrook 1941, p. 99, pl. V, fig. 23. Abattoirs Bore, Adelaide.

perarmatus Micantapex — *Micantapex*
Powell 1944, p. 14, pl. 7, fig. 1. Clifton Beach, W. of Princetown.

perelongatus Cerithiopsis — *Coxellaria*
Ludbrook 1941, p. 90, pl. IV, fig. 25. Abattoirs Bore, Adelaide.

perglobosa Ethminolia — *Minolia*
Ludbrook 1941, p. 86, pl. IV, fig. 5. Abattoirs Bore, Adelaide.

perspectiva Natica — *Globisinum*
Tate 1893, p. 326, pl. X, fig. 7. Lower beds, Muddy Creek.

perstriata Voluta anticingulata — Printer's error for *persulcata*
McCoy 1866a, p. 380.

persulcata Voluta anticingulata — *Ternivoluta*
McCoy 1866a, p. 380. 1874, p. 25. Ad. 21 Bird Rock Cliffs.

pertusa Cominella (?) — *Cominella*
Tate 1888, p. 147, pl. IX, fig. 11. Adelaide Bore, Kent Town.

phanerospira Bullinella — *Cylichna*
Cossmann 1897, p. 15, pl. II, fig. 12-14. Lower beds, Muddy Creek.

physa Marginella — *Hianoginella*
Cotton 1949b, p. 212, pl. XVIII. Bore 69, 320 ft, S.A. Mines Dept.

pinguicula Eulima — *Melanella*
Chapman & Gabriel 1914, p. 319, pl. XXVII, fig. 26. Mallee Bore 10, 225-230 ft.

piscatorius Hispidofusus — *Hispidofusus*
Darragh 1969, p. 68, pl. 2, fig. 2-3, 5. Upper horizon, Fischers Point, Aire River.

placuna Calyptraea — *Zegalerus*
Tate 1893, p. 331, pl. VII, fig. 4. Adelaide Bore, Kent Town.

planata Triforis — *Notosinister*
Tenison Woods 1879b, p. 6. pl. 1. fig. 12. Lower beds, Muddy Creek.

planicarinatum Spectamen — *Spectamen*
Ludbrook 1956, p. 17, pl. 2, fig. 4. Abattoirs Bore, Adelaide.

planiconicum Pulchrastele — *Pulchrastele*
Ludbrook 1941, p. 86, pl. IV, fig. 12. Abattoirs Bore, Adelaide.

planilabrum Closia (Closia) — *Microginella*
Ludbrook 1958, p. 81, pl. 3, fig. 12. Weymouth Bore 310-330 ft, Adelaide.

platypleura Cancellaria — Invalid name change
Type species of *Gergovia*
nom. nov. for *Cancellaria laticostata* Tenison Woods 1879. Tate 1898, p. 389.

platypyga Cypraea (Aricia) — *Zoila (Zoila)*
McCoy 1876a, p. 39, pl. XXX, fig. 1-1c. Mt Eliza (Grice Creek).

platyrhyncha Cypraea (Aricia) — *Umbilia*
McCoy 1876a, p. 40, pl. XXX, fig 2-2c. Ad 22, Bird Rock, Torquay.

platyspira Terebra — *Nototerebra*
Tate 1886a, p. 6. 1889, p. 159, pl. VIII, fig. 12. Lower beds, Muddy Creek.

platyspira Turritella — *Colpospira*
Tenison Woods 1879a, p. 234, pl. 20, fig. 13. Lower beds, Muddy Creek.

platyspiroides Turritella (Colpospira) — *Colpospira*
Ludbrook 1957, p. 19, pl. 2, fig. 1, 2. Abattoirs Bore, Adelaide.

platystrophia Clavella — *Austrolithes*
Pritchard 1904, p. 322, pl. XVIII, fig. 4, 5. Lower beds, Muddy Creek.

pleiophylla Scalaria (Cirsotrema) — *Cirsotrema*
Tate 1890, p. 231. 1892, pl. XII, fig. 1. Adelaide Bore; Corio Bay; Spring Creek.

pleurotomella Cryptoborsonia — *Cryptoborsonia*
Type species of genus
Powell 1944, p. 43, pl. 1, fig. 12. Balcombe Bay.

plicata Notoluponia — *Notoluponia*
Schilder 1935, p. 348, fig. 40, 41. Grice Creek.

pliocenica Herpetopoma — *Herpetopoma*
Ludbrook 1941, p. 87, pl. IV, fig. 18. Abattoirs Bore, Adelaide.

polita Natica — *Friginatica*
Tenison Woods 1876, p. 23 fig. IV. Table Cape.

polita Pyramidella ?
Johnston 1880, p. 34. Table Cape.

polita Voluta *Notopeplum*
Type species of genus
Tate 1889, p. 127, pl. 2, fig. 7. Lower beds, Muddy Creek.

polycesta Borsonia *Borsonia*
Tate 1898, p. 395, pl. 19, fig. 2. Cape Otway.

polynema Scalaria (Hemiacirsa) *Notacirsa*
Tate 1890, p. 235. 1892, pl. XII, fig. 9. Bird Rock Bluff.

polyphyllia Trophon *Apixystus*
Tenison Woods 1879b, p. 7, pl. 2, fig. 1. Lower beds, Muddy Creek.

pompholugota Trivia *Semitrivia* (?)
Tate 1890, p. 214. Adelaide Bore, Kent Town.

ponderosa Montfortula *Montfortula*
Chapman & Gabriel 1923, p. 33, pl. II, fig. 25. Mitchell River.

powelli Epidirona *Epidirona*
Ludbrook 1958, p. 86, pl. 5, fig. 3. Weymouth Bore 310-530 ft, Adelaide.

powelli Guraleus (Euguraleus) *Euguraleus*
Ludbrook 1958, p. 91, pl. 5, fig. 9. non Dell 1956. Weymouth Bore 310-330 ft, Adelaide.

powelli Nepotilla *Nepotilla*
Ludbrook 1958, p. 96, pl. 6, fig. 22. Weymouth Bore 310-330 ft, Adelaide.

praecompressa Cocculina *Cocculinella*
Chapman & Gabriel 1923, p. 25, pl. 1, fig. 5-8. Lower beds, Muddy Creek.

praecursor Spectamen *Spectamen*
Ludbrook 1956, p. 18, pl. 2, fig. 5. Weymouth Bore 310-330 ft, Adelaide.

praecursoria Zemira *Zemira*
Tate 1888, p. 163, pl. XI, fig. 5. Lower beds, Muddy Creek.

praefasciata Syrnola (Agatha) *Agatha*
Ludbrook 1957, p. 40, pl. 3, fig. 5. Weymouth Bore 310-330 ft, Adelaide.

praeformicula Marginella *Plicaginella*
Chapman & Gabriel 1914, p. 326, pl. XXVIII, fig. 35. Mallee Bore 8, 180-199 ft.

praegracilicostata Terebra *Punctoterebra*
Pritchard 1896, p. 104, pl. II, fig. 9. Table Cape.

praegranifera Triphora (Notosinister) *Notosinister*
Ludbrook 1957, p. 35, pl. 2, fig. 16. Weymouth Bore 310-330 ft. Adelaide.

praelonga Ringicula *Ringicula*
Cossmann 1897, p. 20, pl. II, fig. 25, 26. Lower beds, Muddy Creek.

praemeridionalis Homalaxis *Mangonuia*
Chapman 1912c, p. 189, pl. XII, fig. 4-6. Altona Bay coal shaft.

praenominata Oliva — *Lamprodomina*
nom. nov. for *Oliva angustata* Tate 1889 non Marratt 1870. Cossmann 1912a, p. 215.

praenovarensis Turboella — *Turboella*
Ludbrook 1956, p. 28, pl. 2, fig. 14. Abattoirs Bore, Adelaide.

praespurca Etrema — *Etrema*
Chapman & Crespin 1928, p. 122, pl. IX, fig. 60. Sorrento Bore 1107 ft.

prattii Triton — *Cymatiella*
Tenison Woods 1879a, p. 223, pl. 21, fig. 15. Lower beds, Muddy Creek.

princeps Crossea — *Crosseola*
Tate 1890, p. 220. 1892, pl. VIII, fig. 6, 6a. Adelaide Bore, Kent Town; Lower beds, Muddy Creek; Murray Cliffs near Morgan.

prionota Scalaria (Nodiscala) — *Hirtoscala*
Tate 1890, p. 225. 1892, pl. x, fig. 8. Lower beds, Muddy Creek.

prionotus Murex — *Murexsul*
Tate 1888, p. 107, pl. 1, fig. 5. Adelaide Bore, Kent Town.

pritchardi Apiotoma — *Apiotoma*
Powell 1944, p. 20, pl. 3, fig. 7. Torquay.

pritchardi Cerithium — *Chavanicerithium*
nom. nov. for *Potamides semicostatum* Tate 1885 non Deshayes 1833. Harris 1897, p. 225.

pritchardi Genotia — *Micantapex*
Tate 1894, p. 175, pl. X, fig. 9. Gippsland Lakes.

pritchardi Natica — *Globisinum*
nom. nov. for *Natica arata* Tate 1893 non Lycett 1863. Cossmann 1907, p. 201.

pritchardi Turritella (Zaria) — *Spirocolpus*
Cossmann 1912b, p. 199, pl. 8, fig. 6. Cape Otway.

profunda Terebra — *Acuminia*
Chapman & Gabriel 1914, p. 326, pl. XXVIII, fig. 36. Mallee Bore 10. 225-230 ft.

profundus Trophon — *?*
Chapman & Crespin 1928, p. 119, pl. VIII, fig. 54. Sorrento Bore 1107 ft.

propinqua Marginella — *Exiginella*
Tate 1878, p. 94. Muddy Creek, River Murray Cliffs.

protensa Borsonia — *Borsonia*
Tate 1898a, p. 394, pl. 19, fig. 6. Cape Otway.

protensus Triton — *Austrotriton*
Tate 1888, p. 124, pl. V, fig. 10. Lower beds, Muddy Creek.

protorhysa Voluta — *Notopeplum*
Tate 1889, p. 126, pl. II, fig. 6 a, b. Adelaide Bore, Kent Town.

provisi Diastoma — *Diastoma*
Tate 1894, p. 177, pl. X, fig. 6. Dry Creek Bore.

pseudaustralis Ancillaria — *Baryspira*
Tate 1889, p. 148, pl. VII, fig. 1. Lower beds, Muddy Creek.

pseudoclarae Comitas — *Comitas*
Powell 1944, p. 18, pl. 1, fig. 6. Torquay.

pseudoelegans Etrema — *Etrema*
Chapman & Crespin 1928, p. 123, pl. IX, fig. 61. Sorrento Bore 1158 ft.

pseudolirata Voluta — *Notovoluta*
Tate 1888, p. 176, pl. XIII, fig. 6. 1889, p. 131. Lower beds, Muddy Creek.

psila Niso — *Niso*
Tenison Woods 1879b, p. 18, pl. 1, fig. 6. Lower beds, Muddy Creek.

psila Triforis wilkinsoni — *Callitriphora*
Tenison Woods 1879b, p. 6. pl. I, fig. 10. Lower beds, Muddy Creek.

ptychodermis Conus — *Conus*
Tate 1890, p. 195, 1892, pl. VII, fig. 3. Lower beds, Muddy Creek.

ptychotropis Cancellaria — *Oamaruia*
Tate 1889, p. 156, pl. IX, fig. 5. Lower beds, Aldinga.

pueblensis Voluta — *Notovoluta*
Pritchard 1898, p. 109, pl. VIII, fig. 7. Lower beds, Spring Creek.

pulchra Bela — *Belatomina*
Type species of genus
Tate 1888, p. 173, pl. IV, fig. 2. Muddy Creek.

pulchra Fenestrodaphne — *Fenestrodaphne*
Type species of genus
Powell 1944, p. 61, pl. 6, fig. 10. Abattoirs Bore 400-500 ft, Adelaide.

pulcherrima Teinostoma — *Starkeyna*
Chapman & Gabriel 1914, p. 317, pl. XXVII, fig. 25 a, c. Mallee Bore 10. 225-230 ft.

pulligera Harpa — *Austroharpa*
Type species of genus
Tate 1889, p. 151, pl. VI, fig. 9. Mornington.

pullulascens Conus — *Parviconus*
Tenison Woods 1879b, p. 3, pl. 1, fig. 3-4. Lower beds, Muddy Creek.

pullulascens Pleurotoma — *Mauidrillia*
Tenison Woods 1877, p. 104. Table Cape.

pumila Cominella — *Cominella*
Tate 1888, p. 148, pl. IV, fig. 12. Adelaide Bore, Kent Town.

pumila Peristernia — *?*
Tate 1889, p. 117, pl. VIII, fig. 4. Adelaide Bore, Kent Town.

punctulifera Litiopa — *Litiopa*
Tate 1894, p. 183, pl. XI, fig. 9, 9a. Gellibrand River.

purpuroides Peristernia — *Bedeva*
Tate 1888, p. 154, pl. IX, fig. 3. Upper beds, Muddy Creek.

purpuroides Ricinula — *Zeapollia*
Johnston 1880, p. 33. Table Cape.

puteolata Actaeon — *Odontostomia*
Pritchard 1896, p. 124, pl. IV, fig. 10-12. Table Cape.

pygmaea Notadusta — *Notadusta*
Schilder 1935, p. 351, fig. 50. "Australia".

pyramidale Potamides — *?*
Tate 1885b, p. 226. Table Cape.

pyrula Megatebennus concatenatus — *Cosmetalepas*
Chapman 1926, p. 133, pl. X, fig. 3. Neumerella.

pyrulata Cypraea — *Notoluponia*
Tate 1890, p. 207. 1892, pl. VI, fig. 4 a-c. Lower beds, Muddy Creek.

pyrulata Erato — *Archierato*
Type species of genus
Tate 1890, p. 216. 1892, pl. XIII, fig. 12. Lower beds, Aldinga; Adelaide Bore.

quadricarinatus Xenoturris (Veruturris) — *Veruturris*
Type species of genus
Powell 1944, p. 11, pl. 1, fig. 5. Lower beds, Muddy Creek.

quadricingulata Leiopyrga — *Leiopyrga*
Tate 1891, p. 261. Upper beds, Muddy Creek; Kalimna.

quadricingulatus Clanculus — *Euriclanculus*
Ludbrook 1941, p. 82, pl. IV, fig. 2. Abattoirs Bore, Adelaide.

quinquelirata Trichotropis — *Cerithioderma*
Tate 1890, p. 189. 1892, pl. XII, fig. 12. Bird Rock Bluff.

radialis Sequenzia — *Basilissa*
Tate 1890, p. 192. 1892, pl. IX, fig. 6, 6a. Lower beds, Muddy Creek.

radialis Triton — *Austrotriton*
Type species of genus
Tate 1888, p. 118, pl. V, fig. 8. River Murray Cliffs near Morgan.

radiapex Syngenochilus — *Syngenochilus*
Type species of genus
Powell 1944, p. 66, pl. 6, fig. 4. Upper beds, Torquay.

radiata Semicassis — *Casmaria*
Tate 1889, p. 168, pl. VIII, fig. 3. Well sinking, Murray Desert (Tareena).

radicans Turbonilla — *Pyrgiscus*
Chapman & Crespin 1928, p. 109, pl. VII, fig. 35. Sorrento Bore 670 ft.

ralphii Conus — *Conus*
Tenison Woods 1879a, p. 228, pl. 21, fig. 14. Lower beds, Muddy Creek.

ralphi Mitra — *Austromitra*
nom. nov. for *Mitra tatei* Cossmann 1899 non Angas 1879. Cossmann 1900, p. 186.

ralphi Mammiscala — *Mammiscala*
Type species of genus
nom. nov. for *Scalaria pachypleura* Tate 1890 non Conrad 1841. de Boury 1909, p. 255.

ralphi Volutoconus — *Volutoconus*
nom. nov. for *Voluta conoidea* Tate 1889 non Renier 1804. Finlay 1930, p. 44.

rangiana Styliola — *Clio*
Tate 1887c, p. 194, pl. XX. fig. 2. Lower beds, Muddy Creek.

refractus Fossarus — *Fossarus*
Tate 1898, p. 400, pl. 19, fig. 9. Table Cape.

regula Marginella — *Marginella*
Cotton 1949b, p. 213, pl. XVIII. Lower beds, Aldinga.

reticosa Cerithiopsis — *Cerithiella*
Chapman & Crespin 1928, p. 117, pl. VIII, fig. 50. Sorrento Bore 1461 ft.

rhomboidalis Pleurotoma — *Micantapex*
Tenison Woods 1879b, p. 10, pl. 2, fig. 9. Lower beds, Muddy Creek.

rhysa Natica subinfundibulum — *Sigaretotrema*
Tate 1893, p. 327. River Murray Cliffs.

rhysus Murex — *Pterochelus*
Tate 1888, p. 95, pl. 1. fig. 7. Mornington.

roberti Pyramidella — *?*
Tenison Woods 1877, p. 114. Table Cape.

roblini Fusus — *Austrosipho*
Type species of genus
Tenison Woods 1876, p. 22, fig. VII. Table Cape.

roblini Liotia — *Munditia*
Johnston 1880, p. 39. Table Cape.

rostrata Pisania — *Maculotriton*
Tate 1888, p. 164, pl. X, fig. 10. Upper beds, Muddy Creek.

rotunda Marginella — *Euligenella*
May 1922, p. 10, pl. IV, fig. 4. Table Cape.

rudis Thylacodes — *Serpulorbis*
Tate 1893, p. 343, pl. IX, fig. 8. Table Cape.

rugata Fasciolaria — *Pleuroploca*
Tate 1888, p. 152, pl. VIII, fig. 3. Mornington.

rugicostatus Typhis (Cyphonochelus) — *Siphonochelus*
Chapman & Crespin 1933, p. 72, pl. V, fig. 10. Bore No. 1 Parish of Bumberrah 90-100 ft, Metung.

rugobela Cryptoborsonia — *Cryptoborsonia*
Powell 1944, p. 43, pl. 1, fig. 13. Lower beds, Torquay.

saginatum Notopeplum — *Notopeplum*
Finlay 1930, p. 45. Table Cape.

sagma Marginella — *Kogomea*
Cotton 1949b, p. 216, pl. XVIII. Bore 65 S.A. Mines Dept. 395 ft.

salebrosa Pleurotoma — *Comitas*
Harris 1897, p. 42, pl. III, fig. 3 a-d. Hobson Bay.

salisburyensis Cassis (Hypocassis) — *Hypocassis*
Ludbrook 1958, p. 51, pl. 2, fig. 1, 2. Tennant Bore, Salisbury.

salisburyensis Cocculinella — *Cocculinella*
Ludbrook 1956, p. 26, pl. 2, fig. 1. Tennant Bore, Salisbury.

salisburyensis Triphora (Isotriphora) — *Isotriphora*
Ludbrook 1957, p. 35, pl. 2, fig. 15. Weymouth Bore, Adelaide.

salteriana Cerithium — *Zaclys*
Tenison Woods 1897b, p. 5, pl. 1. fig. 11. Lower beds, Muddy Creek.

samueli Pleurotoma — *Gemmula*
Tenison Woods 1879a, p. 226, pl. 20, fig. 3. Lower beds, Muddy Creek.

sandleroides Pleurotoma — *Syntomodrillia*
Tenison Woods 1877, p. 104. Table Cape.

sarissa Voluta — *Alcithoe*
Tate 1889, p. 129, pl. II, fig. 1 a, b. Lower beds, Muddy Creek.

sayceana Pleurotoma — *Epidirella*
Chapman 1912c, p. 191, pl. XII, fig. 7. Lakes Entrance.

sayceana Leiopyrga — *Leiopyrga*
Tate 1891, p. 261, Beaumaris.

scabriculus Pseudoinquisitor — *Inquisitor*
Powell 1944, p. 29, pl. 3, fig. 2. Gippsland Lakes.

scabrosus Serratifusus — *Serratifusus*
Darragh 1969, p. 90, pl. 5, fig. 84, 101, 105. Lower horizon, Fitchers Point, Aire River.

scalaris Terebra — *Cerithiopsis*
Tate 1886a, p. 6. River Murray Cliffs near Morgan.

scalena Cypraea — *Austrocypraea*
Tate 1890, p. 203. 1892, pl. V, fig. 2, 2a. Lower beds, Muddy Creek.

scrobiculata Roxania — *Roxania*
Cossmann 1897, p. 16, pl. II, fig. 17, 18. Lower bed, Muddy Creek.

scrobiculatus Actaeon — *Acteon*
Tenison Woods 1877, p. 102. Table Cape.

sculptilis Bela — *Liratomina*
Type species of genus
Tate 1888, p. 173, pl. IV, fig. 1. Muddy Creek.

sculptilis Fusus — *Fusinus*
Tate 1888, p. 137, pl. 10, fig. 13. Adelaide Bore, Kent Town.

secta Mauidrillia — *Mauidrillia*
Powell 1944, p. 37, pl. 4, fig. 10. Lower beds, Aldinga.

selwyni Pleurotoma — *Turris*
Pritchard 1904, p. 326, pl. XIX, fig. 1. Lower beds, Muddy Creek.

selwyni Trophon — *Austrofusus*
Pritchard 1896, p. 79, pl. II, fig. 7. Lower beds, Spring Creek.

semiacuticostata Lyria — *Lyria*
Pritchard 1896, p. 91, pl. II, fig. 8. Table Cape.

semicostata Cancellaria ?
Tate 1889, p. 157, pl. X, fig. 3. Lower beds, Muddy Creek.

semicostata Pisania *Buccinulum*
Tate 1888, p. 164, pl. IV, fig. 9. Upper beds, Muddy Creek.

semicostatum Potamides See *Cerithium pritchardi* Harris 1897
Tate 1885b, p. 226, non Deshayes 1833. Table Cape.

semicostatus Aesopus *Retizafra*
Tenison Woods 1879b, p. 14, pl. 3, fig. 9. Lower beds, Muddy Creek.

semilaevis Ancillaria *Baryspira (Gracilispira)*
Tenison Woods 1879a, p. 229, pl. 20, fig. 7. Lower beds, Muddy Creek.

semilaevis Mitra = *Mitra ralphi* Cossmann 1900
Mitra tatei Cossmann 1899
Tate 1889, p. 143, pl. V, fig. 9. non Edwards 1857. Lower beds, Muddy Creek.

semiornata Calliostoma *Calliostoma*
Chapman 1926, p. 133, pl. X, fig. 5, 6. Lower beds, Muddy Creek.

semiornata Crossea *Crosseola*
Tate 1893, p. 317, pl. X, fig. 10. Bird Rock Bluff.

semiplana Coronasyrinx *Cochlespira*
Powell 1944, p. 22, pl. 1, fig. 2. Lower beds, Aldinga.

semiplicatus Hypotrochus *Hypotrochus*
Ludbrook 1957, p. 31, pl. 2, fig. 10. Weymouth Bore 310-330 ft, Adelaide.

semiundulata Peristernia ?
Pritchard 1896, p. 89, pl. II, fig. 10, 11. Table Cape.

senticosus Fusus *Hispidofusus*
Type species of genus
Tate 1888, p. 135, pl. VII, fig. 3. Lower beds, Muddy Creek.

septemlirata Pleurotoma *Turris*
Harris 1897, p. 39, pl. II, fig. 10 a-d. Lower beds, Muddy Creek.

septemplicata Marginella *Microginella*
Tate 1878, p. 95. Muddy Creek.

septifraga Turritella *Gazameda*
Tate 1893, p. 336, pl. VIII, fig. 5. Bird Rock Bluff.

serotinoides Ataxocerithium *Ataxocerithium*
Chapman & Crespin 1928, p. 118, pl. VIII, fig. 52. Sorrento Bore 1090 ft.

serratulus Cantharidus *Prothalotia*
Pritchard 1904, p. 331, pl. XIX, fig. 5, 6. Lower beds, Muddy Creek.

serrulata Mauidrillia *Mauidrillia*
Powell 1944, p. 36, pl. 4, fig. 8. Balcombe Bay.

sexcostatus Triton *Cymatiella*
Tate 1888, p. 127, pl. VI, fig. 9. Upper beds, Aldinga.

sexuaplicata Voluta (Aulica) *Notovoluta*
Chapman 1922, p. 15, pl. iii, fig. 24. Clifton Bank, Muddy Creek.

simnioides Notoluponia brachypyga — *Notoluponia*
Schilder 1935, p. 349, fig. 46. Grice Creek.

simplex Terebra — = *Terebra tenisoni* Finlay 1927
Tenison Woods 1876, p. 21, fig. 1. non Conrad 1830. Table Cape.

simplicior Zoila (Zoila) platypyga — *Zoila (Zoila)*
Schilder 1935, p. 338. Lower beds, Muddy Creek.

simulans Fusus — *Fusinus*
Tate 1888, p. 137, pl. X, fig. 2 a, b. River Murray Cliffs near Morgan.

singletoni Brookula — *Brookula*
Chapman & Crespin 1928, p. 107, pl. VI, fig. 30 a, b. Sorrento Bore 1461 ft.

singletoni Guraleus — *Guraleus*
Powell 1944, p. 48, pl 6, fig. 14. Forsyth's Grange Burn.

sinotecta Tudicula — *Tudicula*
Ludbrook 1941, p. 97, pl. V, fig. 14. Abattoirs Bore, Adelaide.

siphonata Cypraea — *Palliocypraea*
Chapman 1922, p. 12, pl. III, fig. 16. Below Waikerie, Murray River.

sordida Mitra — *Austromitra*
Tate 1889, p. 143, pl. VI, fig. 6. Muddy Creek.

spatiosa Siphonalia — *Austrosipho*
Tate 1888, p. 143, pl. IV, fig. 5. Upper beds, Muddy Creek.

spectabilis Valsantia — *Valsantia*
Type species of genus
Ludbrook 1957, p. 20, pl. 2, fig. 3. Hindmarsh Bore 450-480 ft.

spenceri Voluta — *Pterospira*
Pritchard 1896, p. 98, pl. IV, fig. 1, 2. Table Cape.

sphaerodoma Cypraea — *Umbilia*
Tate 1890, p. 209. 1892, pl. VIII, fig. 5. River Murray Cliffs near Morgan.

spinicarinatus Laetifautor — *Laetifautor*
Ludbrook 1941, p. 84, pl. IV, fig. 8. Abattoirs Bore, Adelaide.

spiniferus Fusus — = *Columbarium spinulatum* Cossmann 1901
Tate 1888, p. 134, pl. VII, fig. 1. non Bellardi 1872. River Murray Cliffs near Morgan.

spinulatum Columbarium — *Columbarium*
nom. nov. for *Fusus spinifer* Tate non Bellardi 1872. Cossmann 1901, p. 16.

spiraliscarbra Nassa — *Reticunassa*
Chapman & Gabriel 1914, p. 325, pl. XXVIII, fig. 34. Mallee Bore No. 8, 199-204 ft.

spirata Harpa — *Austroharpa*
Tate 1889, p. 150, pl. VI, fig. 3. Mornington.

squamogranosa Architectonica (Discotectonica) — *Discotectonica*
Chapple 1941, p. 123, pl. XIV, fig. 1, 1a. Lower beds, Muddy Creek.

squamoidea Montfortula — *Montfortula*
Chapman & Gabriel 1923, p. 33, pl. II, fig. 26. Lower beds, Muddy Creek.

squamulatus Serratifusus — *Serratifusus*
Darragh 1969, p. 98, pl. 5, fig. 80-81, 83, 91. Manyung Rocks, Mount Eliza.

staminea Leucozonia — *Latirolagena*
Tate 1888, p. 163, pl. IX, fig. 13. Mornington.

steiroides Filodrilla — *Microdrillia*
Chapman & Crespin 1928, p. 121, pl. IX, fig. 57. Mornington.

stellatus Serratifusus — *Serratifusus*
Darragh 1969, p. 97, pl. 5, fig. 82, 86, 93. Grice Creek.

stephensi Voluta — *Pterospira*
Johnston 1880, p. 35. Table Cape.

stevensiana Rissoa — *Subestea*
Tenison Woods 1877, p. 100. Table Cape.

stiza Drillia — *?*
Tenison Woods 1879b, p. 12, pl. 2, fig. 11. Lower beds, Muddy Creek.

stolida Voluta — *Pseudocymbiola*
Johnston 1880, p. 36. Table Cape.

stratosculptus Semiactaeon — *Semiactaeon*
Ludbrook 1958, p. 102, pl. 6, fig. 13. Abattoirs Bore, Adelaide.

strigata Minolia — *Spectamen*
Tenison Woods 1879a, p. 235, pl. 21, fig. 7. Lower beds, Muddy Creek.

strombiformis Marginella — *Marginella*
Tenison Woods 1877, p. 109. Table Cape.

strophodon Voluta — *Pseudocymbiola*
McCoy 1876b, p. 25, pl. XXXVII, fig. 2-4c. Ad 14, Curlewis.

sturtii Turritella — *Ctenocolpus*
Tenison Woods 1877, p. 99. Table Cape.

stylacris Mesalia — *Sigmesalia*
Tate 1893, p. 341, pl. IX, fig. 2. Lower beds, Aldinga.

styliformis Fusus — *Varicosipho*
Tenison Woods 1879b, p. 12, pl. 3, fig. 6. Lower beds, Muddy Creek.

subacricula Turritella — *Gazameda*
Cotton & Woods 1935, p. 376, fig. 3. Abottoirs Bore 300-500 ft.

subalveolatus Muricopsis = *Murex graniformis* Harris 1897
nom. nov. for *Murex alveolatus* Tate 1888 non Sowerby 1823 Cossmann 1907, p. 200.

subampliata Ancillaria — *Ancillista*
Tate 1889, p. 147, pl. VII, fig. 3. Lower beds, Muddy Creek.

subaustralis Proterato (Cypraeerato) — *Sulcerato*
Ludbrook 1958, p. 43, pl. 1, fig. 1, 2. Hindmarsh Bore 450-487 ft.

subbicolor Amphithalamus (Pisinna) — *Pisinna*
Ludbrook 1956, p. 27, pl. 2, fig. 10. Abattoirs Bore, Adelaide.

subcalvatus Semivertagus — *Semivertagus*
Tate 1894, p. 178, pl. XI, fig. 3, 3a. Upper beds, Aldinga.

subcatenifera Terebra *Gemmaterebra*
Tate 1889, p. 160. Cunninghame; Jemmy's Point.

subconcava Pleurotoma *Veruturris*
Harris 1897, p. 41, pl. iii, fig. 2 a-b. Meribee River.

subcontusa Austrocypraea *Austrocypraea*
Schilder 1935, p. 341, fig. 23. Grice Creek.

subcopiosa Hinia (Reticunassa) *Reticunassa*
Ludbrook 1958, p. 64, pl. 3, fig. 1. Hindmarsh Bore 459-487 ft.

subcrenularis Mitra *Waimatea*
Tate 1889, p. 142, pl. V. fig. 6. Adelaide Bore, Adelaide.

subfilicea Cominella *Cominella*
Tate 1888, p. 147, pl. X, fig. 6. Upper beds Aldinga.

subfusca Turbonilla *Chemnitzia*
Ludbrook 1941, p. 93, pl. V, fig. 7. Abattoirs Bore, Adelaide.

subglabra Eucithara *?*
Chapman & Crespin 1928, p. 121, pl. IX, fig. 58. 850 ft. Sorrento Bore.

subgradata Ancillaria *Ancillista*
Tate 1889, p. 146, pl. VII, fig. 8. Adelaide Bore, Kent Town.

subgranarium Bittium (Semibittium) *Semibittium*
Ludbrook 1957, p. 27, pl. 2, fig. 8. Hindmarsh Bore 450-487 ft.

subgranosa Semicassis *Antephalium*
Tate 1889, p. 166, pl. VII, fig. 10. Edithburgh, Yorke's Peninsula.

subinfundibulum Natica *Sigaretotrema*
Tate 1893, p. 327, pl. X, fig. 11; pl. VI, fig. 6. Lower beds, Muddy Creek.

subjugum Uber *Polinices*
Cotton 1947, p. 668, pl. XXI, fig. 15, 16. Abattoirs Bore, Adelaide.

sublabiata Crossea *Dolicrossea*
Tate 1890, p. 221. 1892, pl. VI, fig. 9. Lower beds, Muddy Creek.

sublaevis Murex *Murexsul*
Tate 1888, p. 104, pl. iii, fig. 3. Lower beds. Aldinga.

sublirella Nasa *Niotha*
Tate 1888, p. 171. 1889, p. 118, pl. iv, fig. 2. Upper beds, Muddy Creek.

subnitidus Guraleus *Euguraleus*
Ludbrook 1941, p. 99, pl. V, fig. 22. Abattoirs Bore, Adelaide.

subnoae Natica *Taniella*
Tate 1893, p. 320, pl. VI, fig. 1. Bird Rock Bluff.

suboctogonus Hexaplex (Murexsul) *Murexsul*
Ludbrook 1958, p. 57, pl. 2, fig. 17. Kooyonga Bore, Adelaide.

subpyrulata Cypraea *Notoluponia*
Tate 1890, p. 206. 1892, pl. v, fig. 5. Lower beds, Muddy Creek.

subquadrata Trichotropis *Sirius*
Tate 1890, p. 188. 1892, pl. xiii, fig. 3. Lower beds, Muddy Creek.

subquinquidens Marginella — *Eratoidea*
May 1922, p. 10, pl. IV, fig. 3. Table Cape.

subregularis Notoluponia — *Notoluponia*
Schilder 1935, p. 347, fig. 34. Lower beds, Muddy Creek.

subreticulata Ricinula — *Lepsiella*
Tate 1888, p. 114, pl. XII, fig. 7. Upper beds, Muddy Creek.

subrudis Turritella murrayana — *Maoricolpus*
Cotton & Woods 1935, p. 371, fig. 1. Abattoirs Bore 300-500 ft.

subscalatus Actaeon — *Acteon*
Cossmann 1897, p. 2, pl. 1, fig. 8, 9. Lower beds, Aldinga.

subsidua Cypraea — *Austrocypraea*
Tate 1890, p. 204. 1892, pl. V, fig. 3, 3a, b. Lower beds, Muddy Creek.

subsimplex Phasianotrochus — *Phasianotrochus*
Ludbrook 1941, p. 83, pl. IV, fig. 10. Abattoirs Bore, Adelaide.

subspectabilis Terebra — *Pervicacia*
Tate 1889, p. 162, pl. IX, fig. 11. Upper beds, Muddy Creek.

substolida Natica — *Austrocochlis*
Tate 1893, p. 323, pl. VI, fig. 3. Lower beds, Muddy Creek.

subtabulata Calyptraea — *Calyptraea*
Tate 1893, p. 332, pl. VII, fig. 1. Table Cape.

subtilis Nototrivia — *Nototrivia*
Schilder 1935, p. 335, fig. 14, 15. Lower beds, Muddy Creek.

subundulosa Peristernia — *Streptopelma*
Tate 1888, p. 159, pl. VIII, fig. 12. Lower beds, Muddy Creek.

subvarians Natica — *Conuber*
Tate 1893, p. 322, pl. VI, fig. 8, 10. Jemmy Point, Gippsland.

subvaricosa Chileutomia — *Chileutomia*
Type species of genus
Tate 1898 a, p. 404, pl. 20, fig. 3. Muddy Creek, Mornington, Curlewis and Fyansford.

succinctus Trophon — *Ellicea*
Tenison Woods 1879b, p. 16, pl. 4, fig. 6, 6a. Lower beds, Muddy Creek.

sufflatus Cassis — *Antephalium*
Tenison Woods 1877, p. 93. Table Cape.

sulcata Pyramidella — *Ringicula lactea* Johnston
Johnston 1880, p. 35. non Sowerby 1855. Table Cape.

sulcata Triforis
Tenison Woods 1879a, p. 233, pl. 20, fig. 12. Lower beds, Muddy Creek.

sulcosa Harpa — *Austroharpa*
Tate 1889, p. 150, pl. VI, fig. 10. Lower beds, Muddy Creek.

superspiralis Cerithiella (Coxellaria) — *Coxellaria*
Ludbrook 1957, p. 33, pl. 2, fig. 12. Abattoirs Bore, Adelaide.

supressa Epideira selwyni — *Epidirona*
nom. nov. for *Pleurotoma selwyni* var. *laevis* Pritchard 1903 non Hutton 1873. Finlay 1927b, p. 516.

tabulata Trichotropis — *Sirius*
Tate 1890, p. 187. 1892, pl. XIII, fig. 4. Adelaide Bore, Kent Town.

tabulata Voluta — *Cymbiola*
Tate 1888, p. 176, pl. XIII, fig. 3. 1889, p. 132. Well sinking, Murray Desert, (Tareena, N.S.W.).

talla Marginella — *Marginella*
Cotton 1949b, p. 214, pl. XVIII. S.A. Mines Dept. Bore 21, 400 ft.

tardicrescens Phos — *Phos*
Tate 1888, p. 167, pl. X, fig. 12. Lower beds, Muddy Creek.

tardior Semiactaeon — *Semiactaeon*
Ludbrook 1957, p. 101, pl. 6, fig. 12. Abattoirs Bore, Adelaide.

tasmanica Willungia — *Willungia*
Type species of genus
Powell 1938, p. 370, pl. 39, fig. 4. Table Cape.

tasmanicus Triton — *Ratifusus*
Johnston 1880, p. 33. Tate 1888, p. 129, pl. xi, fig. 11. Table Cape.

tasmanicus Zizyphinus — *Calliostoma*
Johnston 1880, p. 38. Table Cape.

tasmaniensis Turritella acricula — *Gazameda*
Cotton & Woods 1935, p. 376. (Tate 1893, p. 340, pl. IX, fig. 12). Table Cape.

tateana Fusus — *Austrolithes*
Tenison Woods 1877, p. 94. Table Cape.

tateana Rissoina — *Haurakia*
Tenison Woods 1877, p. 114. Table Cape.

tateana Voluta — *Notovoluta*
Johnston 1880, p. 37. Table Cape.

tatei Aneurystoma — *Oamaruia*
nom. nov. for *Cancellaria gradata* Tate 1889 non Hoernes 1856. Cossmann 1899a, p. 24.

tatei Ancilla — *Baryspira*
Marwick 1924, p. 319, pl. 5, fig. 3. Lower beds, Muddy Creek.

tatei Asthenotoma — *Cinguliturris*
Type species of genus
Cossmann 1896, p. 173, pl. 6, fig. 29. "Southern Australia".

tatei Austroharpa — *Austroharpa*
Finlay 1931, p. 14. Abattoirs Bore, Adelaide.

tatei Borsonia — *Borsonia*
Powell 1944, p. 42, pl. 3, fig. 8. Upper beds, Spring Creek.

tatei Cypraea — *Umbilia*
nom. nov. for *Cypraea amygdalina* Tate 1890 non Grateloup 1847. Cossmann 1903, p. 160.

tatei Eumargarita (Turcicula) — *Leiopyrga*
Cossmann 1918, p. 359, pl. 10, fig. 9. Upper beds, Muddy Creek.

tatei Latirus — *Latirus*
Harris 1897, p. 147, pl. V, fig. 7 a-b. Spring Creek.

tatei Mitra — See *Mitra ralphi* Cossmann 1900
nom. nov. for *Mitra semilaevis* Tate non Edwards 1857. non *Mitra tatei* Angas 1879. Cossmann 1899a, p. 165.

tatei Nassa — *Reticunassa*
Tenison Woods 1879, p. 230, pl. 21, fig. 13. Lower beds, Muddy Creek.

tatei Nototrivia — *Nototrivia*
Schilder 1935, p. 336, fig. 16. Altona Brown Coal Shaft.

tatei Proterato — *Proterato*
Schilder 1933, p. 273, fig. 9. Spring Creek.

tatei Ringicula — *Ringicula*
Cossmann 1897, p. 19, pl. II, fig. 32, 33. Muddy Creek.

tatei Scaphander — *Scaphander tenuis* Harris 1897
Cossmann 1897, p. 9, pl. 1, fig. 34, 35. Lower beds, Muddy Creek.

tatei Sipho — Invalid name change
nom. nov. for *Sipho asperulus* Tate non "Deshayes" Cossmann 1898, p. 16.

tatei Siphonalia — Invalid name change
nom. nov. for *Sipho asperulus* Tate 1888. Harris 1897, p. 155.

tatei Vanikoroa — See *Natica pritchardi* Cossmann 1907
nom. nov. for *Natica arata* Tate 1893 non Lycett 1863. Cossmann 1924, p. 166.

tatei Volvulella — *Rhizorus*
Cossmann 1897, p. 8, pl. 1, fig. 26, 27. Upper beds, Muddy Creek.

tatei Xenophora (Tugurium) — *Xenophora*
Harris 1897, p. 254, pl. VII, fig. 7 a-b. Lower beds, Muddy Creek.

tatei Zegalerus — *Zegalerus*
nom. nov. for *Calyptraea corrugata* Tate 1893 non Broderip 1835. Finlay 1927b, p. 497.

tealei Notoluponia — *Notoluponia*
Schilder 1935, p. 347, fig. 32. Grice Creek.

tela Phenacolepas — *Phenacolepas*
Ludbrook 1941, p. 88, pl. IV, fig. 19. Abattoirs Bore, Adelaide.

tenisoni Fasciolaria — *Pleia*
Tenison Woods 1879b, p. 13, pl. 3, fig. 3. Lower beds, Muddy Creek.

tenisoni Terebra — *?*
nom. nov. for *Terebra simplex* Tenison Woods 1876 non Conrad 1830. Finlay 1927b, p. 520.

tenisoni Turbo — *Euninella*
nom. nov. for *Turbo etheridgei* Tenison Woods 1877 non Lycett 1857. Finlay 1927b, p. 493.

tenuicornis Murex — *Siratus*
Tate 1888, p. 100, pl. II, fig. 6. Adelaide Bore, Kent Town.

tenuicostata Pisania — *Ratifusus*
Tenison Woods 1879a, p. 224, pl. 20, fig. 6. Lower beds, Muddy Creek.

tenuilirata Ringicula — *Ringicula*
Cossmann 1897, p. 19, pl. II, fig. 27, 28. Spring Creek.

tenuis Harpa — *Austroharpa*
Tate 1889, p. 151, pl. VI, fig. 1. Lower beds, Muddy Creek.

tenuis Scaphander — *Scaphander*
Harris 1897, p. 12, pl. 1, fig. 4 a-c. Lower beds, Muddy Creek.

tenuisculpta Daphnella — *Belatomina*
Tenison Woods 1877, p. 106. Table Cape.

terebellata Turritella — *Ctenocolpus*
Tate 1893, p. 336. Limestone Creek, Western Victoria.

terebraeformis Mitra — *Balcomitra*
Tate 1889, p. 141, pl. V, fig. 5. Upper beds, Muddy Creek.

teres Austroclavus — *Austroclavus*
Powell 1944, p. 40, pl. 2, fig. 3. Lower beds, Muddy Creek.

tertiaria Pleurotomaria — *Perotrochus*
McCoy 1875b, p. 101, fig. 1876a, p. 23, pl. XXV, fig. 1-1b. Upper beds, Maude $\frac{W}{TM\ 4}$.

tertiaria Spiralis — *Spiratella*
Tate 1887c, p. 196, pl. XX, fig. 12 a-c. Lower beds, Muddy Creek.

tessellatus Eburnopsis — *Eburnopsis*
Tate 1894, p. 174, pl. XI, fig. 10. Spring Creek.

tetragonostoma Delphinula — *Crossea*
Tenison Woods 1877, p. 96. Table Cape.

textilis Cassis — *Hypocassis*
Tate 1882, p. 45. 1889, p. 165, pl. VII, fig. 11. River Murray Cliffs near Morgan.

textilis Triton — *Austrotriton*
Tate 1888, p. 120, pl. V, fig. 12. Lower beds, Muddy Creek.

texturatus Epidromus — *Obex*
Tate 1888, p. 130, pl. VI, fig. 10. Mornington.

tholoides Fusus — *Tectifusus*
Type species of genus
Tate 1888, p. 138, pl. III, fig. 11. Adelaide Bore, Kent Town.

tinela Rissoina — *Rissoina*
Ludbrook 1956, p. 31, pl. 2, fig. 19. Hindmarsh Bore 450-487 ft.

tomopleuroides Xenuroturris (Veruturris) — *Veruturris*
Powell 1944, p. 11, pl. 1, fig. 3. Abattoirs Bore 400-500 ft., Adelaide.

torquatus Trophon — *Zeatrophon*
Tate 1888, p. 110, pl. VI, fig. 2. Lower beds, Aldinga.

torquayensis Borsonia — *Borsonia*
Powell 1944, p. 42, pl. 1, fig. 11. Lower beds, Torquay.

torquayensis Cancellaria — *Sydaphera*
Chapman 1922, p. 16, pl. III, fig. 25. Bird Rock Cliffs.

torquayensis Comitas — *Comitas*
Powell 1944, p. 17, pl. 3, fig. 9. Lower blue clays, Torquay.

torquayensis Ellatrivia minima — *Ellatrivia*
Schilder 1935, p. 334, fig. 9. Spring Creek.

torquayensis Mauidrillia — *Mauidrillia*
Powell 1944, p. 35, pl. 4, fig. 7. Torquay.

torrii Cerithium — *Chavanicerithium*
Tate 1899a, p. 109, pl. 1, fig. 2. Tareena.

tortirostris Triton — *Austrosassia*
Tate 1888, p. 123, pl. V, fig. 7. Mornington.

toxorhyncha Cypraea — *Zoila (Zoila)*
Tate 1890, p. 210. 1892, pl. V, fig. 6; pl. VI, fig. 5. Lower beds, Muddy Creek.

transenna Emarginula — *Emarginula*
Tenison Woods 1877, p. 103. Table Cape.

transenna Fusus — *Microcolus*
Tenison Woods 1877, p. 94. Table Cape.

transenna Scalaria (Cirsotrema) — *Cirsotrema*
Tate 1890, p. 229. 1892, pl. X, fig. 9. Mornington.

transenna Semicassis — *Antephalium*
Tate 1889, p. 166, pl. VIII, fig. 2. Lower beds, Muddy Creek.

transenna Turritella — *Glyptozaria*
Tenison Woods 1879a, p. 234, pl. 20, fig. 8. Lower beds, Muddy Creek.

transiens Nototrivia — *Nototrivia*
Schilder 1935, p. 335, fig. 13. Lower beds, Muddy Creek.

trevori Drillia — *Splendrillia*
Tenison Woods 1879a, p. 227, pl. 20, fig. 4. Lower beds, Muddy Creek.

tridentatus Murex — *Tritonalia*
Tate 1888, p. 108, pl. II, fig. 2. Lower beds, Aldinga Bay.

trigemmata Cerithiella — *Coxellaria*
Type species of genus
Chapman & Crespin 1928, p. 116, pl. VIII, fig. 48. Mitchell River.

trilirata Pleurotoma — *Cinguliturris*
Harris 1897, p. 40, pl. III, fig. 1 a-d. Hobson Bay.

trilix Turritella — *Ctenocolpus*
Cotton & Woods 1935, p. 377, fig. 4. Abattoirs Bore 300-500 ft.

trinervis Pseudoinquisitor — *Inquisitor*
Powell 1944, p. 28, pl. 3, fig. 3. Jemmys Point.

trinodosa Semicassis — *Hypocassis*
Tate 1889, p. 167, pl. VII, fig. 12. Bairnsdale.

trinodosus Murex — *Pterochelus*
Tate 1888, p. 96, pl. 1, fig. 4. Upper beds, Muddy Creek.

triplanicincta Seila (Notoseila) *Notoseila*
Ludbrook 1957, p. 34, pl. 2, fig. 13, 14. Abattoirs Bore, Adelaide.

triplicata Scalaria (Eglisia) *Amaea*
Tate 1890, p. 231. 1892, pl. ix, fig. 2. Upper beds, Muddy Creek.

triplicata Trichotropis *Sirius*
Tate 1890, p. 188. 1892, pl. XIII, fig. 6. Adelaide Bore, Kent Town.

tripterus Typhis See *Laevityphis ludbrookae* Keen & Campbell 1964
Tate 1888, p. 93, pl. III, fig. 14. Adelaide Bore, Kent Town. non Grateloup 1833.

triseriale Campanile *Campanile*
Basedow 1902, p. 130, pl. II, fig. 1. Edithburgh; Hallett's Cove.

trispiralis Mauidrillia *Mauidrillia*
Powell 1944, p. 36, pl. 4, fig. 9. Gellibrand River.

tristira Turritella *Colpospira*
Tate 1885b, p. 227. 1893, p. 338, pl. X, fig. 3. Table Cape.

trivialis Fusus *Fusinus*
Tate 1899, p. 107, pl. 1, fig. 4. Well sinking, Mindarie.

trochispira Murex *Paziella*
Tate 1888, p. 106, pl. III, fig. 13. Lower beds, Muddy Creek.

trophonalis Etrema *Retizafra*
Chapman & Crespin 1928, p. 122, pl. IX, fig. 59. 990 ft. Sorrento Bore.

trucidata Austrodrillia *Splendrillia*
Ludbrook 1941, p. 98, pl. V, fig. 20. Abattoirs Bore, Adelaide.

tuberculatum Pulchrastele *Pulchrastele*
Ludbrook 1941, p. 86, pl. IV, fig. 15. Abattoirs Bore, Adelaide.

tuberculatus Phos *Phos*
Tate 1888, p. 168, pl. X, fig. 5. Upper beds, Muddy Creek.

tumida Leucozonia *Latirolagena*
Tate 1888, p. 163, pl. XIII, fig. 2. Lower beds, Muddy Creek.

tumidula Notadusta *Notadusta*
Schilder 1935, p. 351, fig. 49. Grice Creek.

tumulosus Triton *Austrotriton*
Tate 1888, p. 122, pl. V, fig. 2. Lower beds, Muddy Creek.

turbinata Trochita *Calyptropsis*
Tenison Woods 1879a, p. 238, pl. 21, fig. 1. Lower beds, Muddy Creek.

turbinata Tudicula *Tudicla*
Tate 1888, p. 160, pl. X, fig. 7. River Murray Cliffs near Morgan.

turricula Filodrillia *Filodrillia*
Powell 1944, p. 56, pl. 5, fig. 8. Balcombe Bay.

turriculata Cancellaria *Inglisella*
Tate 1889, p. 156, pl. X, fig. 14. Lower beds, Aldinga.

turrita Etrema — *Etrema*

Chapple 1941, p. 120, pl. XIV, fig. 3. Coal mine, Altona.

turrita Filodrillia — *Mauidrillia*

Chapple 1941, p. 121, pl. XIV, fig. 4. Coal mine, Altona.

turritus Epidromus — *Obex*

Tate 1888, p. 130, pl. IV, fig. 4. Lower beds, Muddy Creek.

umbilicata Crepidula — *Calyptropsis*

Johnston 1885b, p. 232, fig. Table Cape.

uncifera Voluta — *Aulicina*

Tate 1888, p. 176, pl. XII, fig. 10. 1889, p. 124. Murray River Cliffs near Morgan.

undosum Astralium (Imperator) — *Bellastrea*

Chapman 1912c, p. 187, pl. XII, fig. 3. Altona Bay coal shaft.

undulata Calyptraea — *Calyptraea*

Tate 1893, p. 332, pl. VII, fig. 3. Lower beds, Muddy Creek.

uniliratum Columbarium — *Columbarium*

Darragh 1969, p. 76, pl. 3, fig. 37, 42-43, 45. Bird Rock Cliffs, Torquay.

uniplica Mitra — *Diplomitra*

(See *Mitra monoploca* Finlay 1927)

Tate 1889, p. 138, pl. IV, fig. 12. Mornington.

validicostata Voluta — Invalid change

nom. nov. for *Voluta alticostata* Tate. Dennant & Kitson 1903, p. 100.

vardoni Surcula — *Epidirona*

Tate 1899a, p. 108, pl. 1, fig. 3 a, b. Tareena; Mindarie.

varians Natica — See *Natica cunninghamensis* Harris 1897

Tate 1893, p. 322, pl. VI, fig. 2, 9. non Dujardin 1837. Lower beds, Muddy Creek.

varicifera Cancellaria — *Bonellitia*

Tenison Woods 1879a, p. 231, pl. 21, fig. 12. Lower beds, Muddy Creek.

varicifera Rissoina — *Zebinella*

Tenison Woods 1877, p. 101. Table Cape.

variciferus Phos (?) — *Loxotaphrus*

Type species of genus

Tate 1888, p. 169, pl. XI, fig. 3. Lower beds, Muddy Creek.

varicosa Mitra — *Mitraria*

Tate 1889, p. 138, pl. V, fig. 1. Adelaide Bore, Kent Town.

varicosus Cantharus — *Cantharus*

Tate 1888, p. 166, pl. VIII, fig. 10. Lower beds, Aldinga.

varilirata Partubiola — *Partubiola*

Ludbrook 1941, p. 87, pl. IV, fig. 17. Abattoirs Bore, Adelaide.

varisculpta Merelina (Linemera) — *Linemera*

Ludbrook 1956, p. 28, pl. 2, fig. 11. Abattoirs Bore, Adelaide.

velificus Murex — *Pterynotus*
Tate 1888, p. 95, pl. 1, fig. 8. Mornington.

venusta Coronasyrinx — *Cochlespira*
(Type species of *Coranosyrinx*)
Powell 1944, p. 22, pl. 1, fig. 1. Upper beds, Torquay.

venusta Syntomodrillia — *Syntomodrillia*
Powell 1944, p. 33, pl. 2, fig. 7. Balcombe Bay.

victoriana Notadusta — *Notadusta*
Type species of genus
Schilder 1935, p. 350, fig. 47, 48. Lower beds, Muddy Creek.

victoriensis Scaphella — Invalid replacement
(Type species of *Notopeplum*)
nom. nov. for *Voluta polita* Tate 1889 "non Conrad 1854". Cossmann 1899a, p. 127.

victoriensis Turritella acricula — *Gazameda*
Cotton & Woods 1935, p. 376. (Tate 1893, p. 340, pl. ix, fig. 4). Gellibrand River.

vitreoides Fusus — *?*
Johnston 1880, p. 32. Table Cape.

vitreus Dissochilus — *Dissochilus*
Tate 1898a, p. 402, pl. 20, fig. 5. Upper beds, Muddy Creek.

vixcostata Turbonilla — *Pyrgolampros*
Ludbrook 1941, p. 92, pl. V, fig. 6. Abattoirs Bore, Adelaide.

vixumbilicata Drillia — *Vixinquisitor*
Type species of genus
Harris 1897, p. 56, pl. III, fig. 8a, b. Lower beds, Muddy Creek.

vixumbilicata Natica — *Conuber*
Tenison Woods 1877, p. 111. Table Cape.

volutiformis Guraleus — *Guraleus*
Chapman & Crespin 1928, p. 123, pl. ix, fig. 62. 1050 ft, Sorrento Bore.

vulsum Columbarium acanthostephes — *Columbarium*
Darragh 1969, p. 89, pl. 3, fig. 32, 35, 40, 46. Grice Creek.

wallacei Murex — *?*
Pritchard 1898, p. 104, pl. VII, fig. 3. Mornington.

wannonensis Cancellaria — *Sydaphera*
Tate 1889, p. 156, pl. VIII, fig. 11. Upper beds, Muddy Creek.

wannonensis Emarginula — *Emarginula*
Harris 1897, p. 288, pl. VIII, fig. 6 a-c. Lower beds, Muddy Creek.

wannonensis Solarium — *Discotectonica*
Tenison Woods 1879a, p. 237, pl. 21, fig. 10. Lower beds, Muddy Creek.

warburtonii Turritella — *Ctenocolpus*
Tenison Woods 1877, p. 99. Table Cape.

weymouthensis Etrema — *Etrema*
Ludbrook 1958, p. 94, pl. 5, fig. 16. Weymouth Bore 310-330 ft, Adelaide.

weeahensis Turbonilla — *Chemnitzia*
Chapman & Gabriel 1914, p. 320, pl. XXVIII, fig. 27 a-b. Mallee Bore 10 225-230 ft.

weldii Voluta — *Pseudocymbiola*
Tenison Woods 1876, p. 24, fig. II. Table Cape.

wentworthii Marginella — *Protoginella*
Tenison Woods 1877, p. 109. Table Cape.

weymouthensis Serrata — *Kogomea*
Ludbrook 1958, p. 83, pl. 3, fig. 20. Weymouth Bore 310-330 ft, Adelaide.

widningae Turbonilla (Chemnitzia) — *Chemnitzia*
Ludbrook 1957, p. 46, pl. 3, fig. 14, 15. Hindmarsh Bore 450-487 ft.

wilkinsoni Triforis — *Callitriphora*
Type species of genus
Tenison Woods 1879a, p. 233, pl. 20, fig. 9. Lower beds, Muddy Creek.

wilsoni Cassidaria — *Galeodea*
Tate 1889, p. 169, pl. VII, fig. 14. Spring Creek.

winteri Marginella — *Exiginella*
Tate 1878, p. 94. Muddy Creek.

wintlei Natica — *Friginatica*
Tenison Woods 1876, p. 23, fig. III. Table Cape.

wirrata Ellatrivia — *Ellatrivia*
Ludbrook 1941, p. 94, pl. V, fig. 16. Abattoirs Bore, Adelaide.

woodsii Bela — *Belophos*
Type species of genus
Tate 1888, p. 173, pl. IV, fig. 3. Table Cape.

woodsi Columbella — *Antizafra*
nom. nov. for *Fusus funiculatus* Tenison Woods 1879a non Reeve 1846. Pritchard 1904, p. 326.

woodsii Cylichna — *Roxania*
Tate 1885b, p. 228. Table Cape.

woodsii Euchelus — *Herpetopoma*
Johnston 1880, p. 38. Table Cape.

woodsii Marginella — *Marginella*
Tate 1878, p. 94. Muddy Creek.

woodsii Triton — *Austrotriton*
Tenison Woods 1879b, p. 15, pl. 3, fig. 1-2. Lower beds, Muddy Creek.

woolnoughi Cerithiopsis — *Zaclys*
Chapman & Crespin 1933, p. 69, pl. V, fig. 7, 8. Fernbank Water Bore 270 ft.

wurongae Turbonilla (Chemnitzia) — *Chemnitzia*
Ludbrook 1957, p. 44, pl. 3, fig. 12. Hindmarsh Bore 450-487 ft.

wynyardensis Pleurotoma — *Comitas*
Pritchard 1896, p. 109, pl. II, fig. 12, 13. Table Cape.

wynyardensis Voluta — *?*
Pritchard 1913, p. 200, pl. XXI, fig. 1, 2. Table Cape.

youngi Fusinus *Serratifusus* (?)

Chapman 1922, p. 14, pl. III, fig. 20. Curlewis.

Catalogue References

Basedow, H., 1901. On the occurrence of Miocene Limestone at Edithburgh, and their stratigraphical relationship to the Eocene of Wool Bay, with description of a new species by Professor R. Tate. *Trans. R. Soc. S. Aust.* 25: 145-148, pl. 3.

————, 1902. Descriptions of new species of fossil mollusca from the Miocene limestone near Edithburgh (including notes by the late Professor Ralph Tate). *Ibid.* 26: 130-132, pl. 2.

————, 1904. Note on Tertiary exposures in the Happy Valley district with description of a new species of *Septifer*. *Ibid.* 28: 248-252.

de Boury, E., 1909. Catalogue des sous-genres de Scalidae. *J. Conch., Paris* 55: 255-8.

Brough Smyth, R., 1875. Report. *Prog. Rep. geol. Surv. Vict.* 2: 1-46.

Chapman, F., 1911. A revision of the species of *Limopsis* in the Tertiary beds of Southern Australia. *Proc. Roy. Soc. Vict.* 23: 419-432, pl. 83-5.

————, 1912a. On an unnamed species of *Pecten* from the Tertiary (Barwonian) of Southern Australia. *Mem. natn. Mus. Vict.* 4: 36-37, pl. 5.

————, 1912b. Notes on a collection of Tertiary limestones and their fossil contents from King Island. *Ibid.* 4: 39-53, pl. 6-7.

————, 1912c. New or little-known Victorian fossils in the National Museum. Part XV—Some Tertiary gasteropoda. *Proc. Roy. Soc. Vict.* 25: 186-192, pl. 12-13.

————, 1915a. New or little-known Victorian fossils in the National Museum. Part XVII—Some Tertiary cephalopoda. *Ibid.* 27: 350-361, pl. 3-8.

————, 1915b. Report on a collection of fossils made by Dr. Wade from the Cainozoic series of South Australia. *Bull. geol. Surv. S. Aust.* 4: 44-50.

————, 1920. Notes on a collection of Tertiary fossils from Ooldea and Watson, South Australia. *Proc. Roy. Soc. Vict.* 32: 225-245, pl. 16-17.

————, 1921. Report of an examination of material obtained from a bore at Torquay. *Rec. geol. Surv. Vict.* 4 (3): 315-324, pl. 51.

————, 1922. New or little-known fossils in the National Museum. Part XXVI—Some Tertiary mollusca. *Proc. Roy. Soc. Vict.* 35: 1-18, pl. 1-3.

————, 1926. Geological notes on Neumerella, and the section from Bairnsdale to Orbost. *Ibid.* 38: 125-142, pl. 10.

———— and Crespin, I., 1928. The Sorrento bore, Mornington Peninsula, with a description of new or little-known fossils. *Rec. geol. Surv. Vict.* 5: 1-195, pl. 1-12.

————, ————, 1933. New and rare Tertiary mollusca from deep borings in Gippsland, Victoria. *Proc. Roy. Soc. Vict.* 46: 66-76, pl. 5.

————, ————, 1934. The palaeontology of the Plantagenet beds of Western Australia. *J. Proc. R. Soc. West. Aust.* 20: 103-136, pl. 6-11.

————, and Gabriel, C. J., 1914. Description of new and rare fossils obtained by deep boring in the Mallee. Part II—Mollusca. *Proc. Roy. Soc. Vict.* 26: 301-330, pl. 24-28.

————, ————, 1923. A revision and description of the Australian Tertiary Patellidae, Patelloididae, Cocculinidae, and Fissurellidae. *Ibid.* 36: 22-40, pl. 1-3.

————, and Singleton, F. A., 1925. A revision of the Cainozoic species of *Glycymeris* in Southern Australia. *Ibid.* 37: 18-60, pl. 1-4.

————, ————, 1927. Descriptive notes on Tertiary mollusca from Fyansford and other Australian localities. Part 1. *Ibid.* 39: 113-124, pl. 10-11.

Chapple, E. H., 1934. Additions to the Tertiary mollusca of Victoria. *Mem. natn. Mus. Vict.* 8: 162-165, pl. 19.

————, 1941. New species of Tertiary mollusca from Victoria. *Ibid.* 12: 119-124, pl. 14.

Cossmann, M., 1896. *Essais de paléoconchologie comparée*. 2. Paris, Author.

————, 1897. The gastropods of the Older Tertiary of Australia—Les Opisthobranches. *Trans. R. Soc. S. Aust.* 21: 1-21, pl. 1-2.

————, 1898. Ouvrages généraux et paléoconchologie. *Revue crit. Paléozool.* 2 (1): 8-23.

————, 1899. *Essais de paléoconchologie comparée* 3.

————, 1900. Rectifications de nomenclature. *Revue crit. Paléozool.* 4 (4): 186.

————, 1901. *Essais de paléoconchologie comparée* 4.

————, 1903. *Ibid.* 5.

————, 1907. Rectifications de nomenclature. *Revue crit. Paléozool.* 11 (3): 200-202.

————, 1912a. Rectifications de nomenclature. *Ibid* 16 (3): 213-214.

————, 1912b. *Essais de paléoconchologie comparée* 9.

————, 1913. Rectifications de nomenclature. *Revue crit. Paléozool.* 17 (1): 61-64.

————, 1918. *Essais de paléoconchologie comparée* 11.

————, 1920. Rectifications de nomenclature. *Revue crit. Paléozool.* 24 (1): 36-38.

————, 1924. *Essais de paléoconchologie comparée* 13.

COTTON, B. C., 1934. A new species of fossil shell from the Upper Pliocene of the Adelaide Plains. *S. Aust. Nat.* 16: 7, fig.

————, 1936. A new fossil bivalve mollusc from South Australia. *Rec. S. Aust. Mus.* 5: 503-4, fig. 1.

————, 1947. Some Tertiary fossil molluscs from the Adelaidean stage (Pliocene) of South Australia. *Ibid.* 8: 653-670, pl. 20-22.

————, 1949a. Australian Recent and Tertiary mollusca. Family Volutidae. *Ibid.* 9: 181-196, pl. 13-16.

————, 1949b. Australian Recent and Tertiary mollusca. Family Marginellidae. *Ibid.* 9: 197-224, pl. 17-20.

————, and LUDBROOK, N. H., 1938. Recent and fossil species of the scaphopod genus *Dentalium* in Southern Australia. *Trans. R. Soc. S. Aust.* 62: 217-228, pl. 12.

————, and WOODS, N. H., 1935. The correlation of recent and fossil Turritellidae of Southern Australia. *Rec. S. Aust. Mus.* 5: 369-387, figs.

CRESPIN, I., 1926. The geology of Green Gully, Keilor, with special reference to the fossiliferous beds. *Proc. Roy. Soc. Vict.* 38: 100-124, pl. 7-9.

————, 1950. Some Tertiary pelecypoda from the Lakes Entrance Oil Shaft, Gippsland, Victoria. *Ibid.* 60: 149-156, pl. 14-17.

————, 1959. New name for a Victorian pelecypod. *J. Paleont.* 33: 1127.

DARRAGH, T. A., 1965a. Revision of the species of *Eucrassatella* and *Spissatella* in the Tertiary of Victoria and Tasmania. *Proc. Roy. Soc. Vict.* 78: 95-114, pl. 12-15.

————, 1965b. *Proxichione* (Pelecypoda: Veneridae) from the Tertiary of South-Eastern Australia. *Ibid.* 79: 165-173, pl. 21-24.

————, 1969. A revision of the Columbariidae (Mollusca: Gastropoda). Ibid. 83: 63-119, pl. 2-6, Fig. 1-24.

DENNANT, J., and KITSON, A. E., 1903. Catalogue of the described species of fossils (except Bryozoa and Foraminifera) in the Cainozoic fauna of Victoria, South Australia and Tasmania. *Rec. geol. Surv. Vict.* 1(2): 89-147.

FINLAY, H. J., 1924. Some necessary changes in the names of New Zealand mollusca *Proc. malac. Soc. Lond.* 16: 99-107.

————, 1927a. A further commentary on New Zealand molluscan systematics. *Trans. N.Z. Inst.* 57: 320-485.

————, 1927b. New specific names for Austral mollusca. *Ibid.* 57: 488-533.

————, 1930. Invalid molluscan names, no. 1. *Ibid.* 61: 37-48.

————, 1931. On *Austrosassia, Austraharpa* and *Austrolithes*, new genera; with some remarks on the gasteropod protoconch. *Ibid.* 62: 7-19.

FOORD, A. H., 1891. *Catalogue of the fossil Cephalopoda in the British Museum (Natural History). Part II Nautiloidea.* London, British Museum (Natural History.)

GATLIFF, J. H., and SINGLETON, F. A., 1930. On the relationship between *"Pecten" asperimus* Lamarck and *"Pecten" antiaustralis* Tate, with a description of an allied fossil form. *Proc. Roy. Soc. Vict.* 42: 71-77, pl. 2-4.

GILL, E. D., and DARRAGH, T. A., 1963. Evolution of the Zenatiinae (Mactridae: Lamellibranchiata). *Ibid.* 77: 177-190, pl. 28-31.

GLAESSNER, M. F., 1955. Pelagic fossils (*Aturia*, Penguins, Whales) from the Tertiary of South Australia. *Rec. S. Aust. Mus.* 11: 353-372, pl. 34-36, text fig. 1-7.

GLENISTER, B. F., MILLER, A. K., and FURNISH, W. M., 1956. Upper Cretaceous and early Tertiary nautiloids from Western Australia. *J. Paleont.* 30: 492-503, pl. 53-56.

HARRIS, G. F., 1897. *Catalogue of Tertiary mollusca in the Department of Geology, British Museum (Natural History). Part I. The Australasian Tertiary Mollusca.* London, British Museum (Natural History).

HEDLEY, C., 1904. On the change of name of *Poroleda lanceolata* Tate. *Victorian Nat.* 21 (8): 112.

————, 1924. A revision of the Australian Pinnidae. *Rec. Aust. Mus.* 14: 142-153, pl. 19-21.

HOWCHIN, W., and COTTON, B. C. 1936. Description of a new cerithoid fossil shell. *Trans. R. Soc. S. Aust.* 60: 31-32.

JENKINS, H. M., 1865. Strata identified by organic remains. *Q. Jl. Sci.* 2 (8): 622-30, pl.

JOHNSTON, R. M., 1880. Third contribution to the natural history of the Tertiary marine beds of Table Cape with a description of 30 new species of mollusca. *Pap. Proc. R. Soc. Tasm.* for 1879: 29-41.

————, 1885a. Additions to the list of Table Cape fossils, together with further remarks upon certain fossil shells, supposed to be identical with living species. *Ibid.* for 1884: 220-224.

————, 1885b. Description of a new fossil shell from the Eocene beds, Table Cape. *Ibid.* for 1884: 232, pl.

————, 1885c. Description of a new species of *Crepidula* from the Eocene beds, Table Cape. *Ibid.* for 1884: 233, pl.

————, 1888. *Systematic account of the geology of Tasmania.* Hobart, Government Printer.

KEEN, A. M., and CAMPBELL, G. B., 1964. Ten new species of Typhinae (Gastropoda: Muricidae) *Veliger* 7: 46-57, pl. 8-11.

LUDBROOK, N. H., 1941. Gastropoda from the Abattoirs bore, Adelaide, South Australia together with a list of some miscellaneous fossils from the bore. *Trans. R. Soc. S. Aust.* 65: 79-102, pl. 4-5.

————, 1955. The molluscan fauna of the Pliocene strata underlying the Adelaide Plains. Part II—Pelecypoda. *Ibid.* 78: 18-87, pl. 1-6.

————, 1956. The molluscan fauna of the Pliocene strata underlying the Adelaide Plains. Part III—Scaphopoda, Polyplacophora, Gastropoda (Haliotidae to Tornidae). *Ibid.* 79: 1-36, pl. 1-2.

————, 1957. The molluscan fauna of the Pliocene strata underlying the Adelaide Plains. Part IV—Gastropoda (Turritellidae to Struthiolariidae) *Ibid.* 80: 17-58, pl. 1-4.

————, 1958. The molluscan fauna of the Pliocene strata underlying the Adelaide Plains. Part V—Gastropoda (Eratoidae to Scaphandridae). *Ibid.* 81: 43-111, pl. 1-6.

————, 1959. A widespread Pliocene molluscan fauna with *Anodontia* in South Australia. *Ibid.* 82: 219-233, pl. 1-5.

————, 1965. Revision of the Tate molluscan types, part 3, Limopsidae, Glycymeridae, Arcidae, Cucullaeidae. *Ibid.* 89: 81-105, pl. 1-5.

————, 1969. The genus *Miltha* (Mollusca: Bivalvia) in the Australian Cainozoic. *Ibid.* 93: 55-63, pl. 1-5.

————, and STEEL, T. M., 1961. A late Tertiary bivalve gastropod from South Australia. *Proc. malas. Soc. Lond.* 34: 228-230, pl. 12.

MCCOY, F., 1866a. On some new species of fossil volutes from the Tertiary beds near Melbourne. *Ann. Mag. nat. Hist.* ser. 3, 18 (107): 375-381.

————, 1866b. On the Australian Tertiary species of *Trigonia*. *Geol. Mag.* 3 (29): 481-2.

————, 1867. Description of two new fossil cowries characteristic of Tertiary beds near Melbourne. *Ann. Mag. nat. Hist.* ser. 3, 20 (120): 436-438.

————, 1874. *Prodromus of the Palaeontology of Victoria* Decade 1. Melbourne, Geological Survey of Victoria.

————, 1875a. On a third new Tertiary species of *Trigonia*. *Ann. Mag. nat. Hist.* ser. 4, 15 (89): 316-7, pl. 18B.

————, 1875b. On a Tertiary Pleurotomaria. *Ibid.* ser. 4, 16 (92): 101-2, text fig.

———, 1875c. *Prodromus of the Palaeontology of Victoria.* Decade 2.

———, 1876a. *Ibid.* Decade 3.

———, 1876b. *Ibid.* Decade 4.

———, 1877. *Ibid.* Decade 5.

———, 1879. *Ibid.* Decade 6.

McGowran, B., 1959. Tertiary nautiloids (*Eutrephoceras* and *Cimomia*) from South Australia. *J. Paleont.* 33: 435-448, pl. 64-66, text fig.

Marwick, J., 1924. An examination of some of the Tertiary mollusca claimed to be common to Australia and New Zealand. *Rep. Australas. Ass. Advmt. Sci.* 16: 316-331.

———, 1928. The Tertiary mollusca of the Chatham Islands including a generic revision of the New Zealand Pectinidae. *Trans. N. Z. Inst.* 58: 432-506.

———, 1938. *Notocallista* and its allies. *Trans. R. Soc. N. Z.* 68: 60-81, pl. 10-14.

———, 1960. A new Pliocene struthiolariid (Gasteropoda) from Flinders Island, Tasmania. *Proc. Roy. Soc. Vict.* 72: 41-44, text fig.

May, W. L., 1922. New species of fossil shells from Table Cape. *Pap. Proc. R. Soc. Tasm.* for 1921: 9-12, pl. 4.

Powell, A. W. B., 1938. Tertiary molluscan faunules from the Waitemata beds *Trans. R. Soc. N. Z.* 68: 362-379, pl. 38-39.

———, 1944. The Australian Tertiary mollusca of the family Turridae. *Rec. Auckland Inst. Mus.* 3: 3-68, pl. 1-7.

Pritchard, G. B., 1895. Contributions to the Palaeontology of the Older Tertiary of Victoria. Lamellibranchs—Part I. *Proc. Roy. Soc. Vict.* 7: 225-231, pl. 12.

———, 1896. A revision of the fossil fauna of the Table Cape beds, Tasmania, with descriptions of new species. *Ibid.* 8: 74-150, pl. 2-4.

———, 1898. Contributions to the palaeontology of the older Tertiary of Victoria. Gastropoda—Part I. *Ibid.* 11: 96-111, pl. 7-8.

———, 1901. Contributions to the palaeontology of the older Tertiary of Victoria. Lamellibranchs—Part II. *Ibid.* 14: 22-31, pl. 2-3.

———, 1903a. Contributions to the palaeontology of the older Tertiary of Victoria. Lamellibranchs—Part III. *Ibid.* 15: 87-103, pl. 12-15.

———, 1903b. On some Australian Tertiary Pleurotomarias. *Ibid.* 16: 83-91, pl. 13-14.

———, 1904. Contributions to the palaeontology of the older Tertiary of Victoria. Gastropoda—Part II. *Ibid.* 17: 320-337, pl. 18-19.

———, 1906. Some palaeontological notes. *Victorian Nat.* 23 (6): 117-120.

———, 1913. A revision of the fossil volutes of the Table Cape beds, Tasmania, with descriptions of new species and varieties. *Ibid.* 26: 192-201, pl. 20-21.

Sharp, B., and Pilsbry, H. A., 1898. *Manual of Conchology* 17, Scaphopoda: 145-224. Philadelphia, Academy of Natural Sciences.

Schilder, F. A., 1926. Additions and corrections to Vredenburg's classification of the Cypraeidae. *Rec. geol. Surv. India.* 58: 358-379.

———, 1932a. Neue fossile Cypraeacea (Moll. Gastr.) *Sber. Ges. naturf. Freunde Berl.* for 1932 (4-7): 254-269.

———, 1932b. Cypraeacea. *Fossilium Catalogus* 1 Animalia 55.

———, 1933. Monograph of the subfamily Eratoinae. *Proc. malac. Soc. Lond.* 20 (5): 244-283, fig. 1-85.

———, 1935. Revision of the Tertiary Cypraeacea of Australia and Tasmania. *Ibid.* 21 (6): 325-355, fig. 1-50.

———, 1966. Neue fossile Cypraeacea und Triviacea aus Australien. *Arch. Molluskenk.* 95 (5-6): 269-274, Fig. 1.

Singleton, F. A., 1932. Studies in Australian Tertiary mollusca, part I. *Proc. Roy. Soc. Vict.* 44: 289-308, pl. 24-26.

———, 1941. Studies in Australian Tertiary mollusca, part II. *Ibid.* 53: 423-428, pl. 20.

———, 1943. An Eocene molluscan fauna from Victoria. *Ibid.* 55: 268-278, pl. 12-13.

———, and Woods, N. H. 1934. On the occurrence of the pelecypod genus *Miltha* in the Australian Tertiary. *Ibid.* 46: 207-213, pl. 8.

SKWARKO, S. K., 1968. The first report of *Neotrigonia* from New Guinea. *Bull. Bur. Miner. Resour. Geol Geophys. Aust.* 92: 191-194, pl. 24.

de STRZELEKI, P. E., 1845. *Physical description of New South Wales and Van Diemen's Land accompanied by a geological map, section, and diagrams, and figures of the organic remains.* London, Longman, Brown, Green, and Longmans.

TATE, R., 1878. The fossil Marginellidae of Australasia. *Trans. phil. Soc. Adelaide.* for 1877-78: 90-98.

————, 1879. Zoologica et Palaeontologica Miscellanea, chiefly relating to South Australia. *Ibid.* for 1878-79: 129-140, pl. 5.

————, 1882. Diagnoses of new species of Miocene fossils from South Australia *Trans. R. Soc. S. Aust.* 5: 44-46.

————, 1885a. Miscellaneous contributions to the palaeontology of the older rocks of Australia. *Sth. Sci. Rec.* (N.S.) 1 (1): 1-5.

————, 1885b. Description of new species of mollusca of the Upper Eocene beds at Table Cape. *Pap. Proc. R. Soc. Tasm.* for 1884: 226-231.

————, 1886a. The fossil Terebridae of Australia. *Sth. Sci. Rec.* (N.S.) 2 (1): 4-8.

————, 1886b. The lamellibranchs of the Older Tertiary of Australia (part 1). *Trans. R. Soc. S. Aust.* 8: 96-158, pl. 2-12.

————, 1887a. The lamellibranchs of the Older Tertiary of Australia (Part II). *Ibid.* 9: 142-189, pl. 14-20.

————, 1887b. The Scaphopods of the Older Tertiary of Australia. *Ibid.* 9: 190-194. pl. 20.

————, 1887c. The Pteropods of the Older Tertiary of Australia. *Ibid.* 9: 194-196, pl. 20.

————, 1888. The Gastropods of the Older Tertiary of Australia—Part I. *Ibid.* 10: 91-176, pl. 1-13.

————, 1889. The Gastropods of the Older Tertiary of Australia—Part II. *Ibid.* 11: 116-174, pl. 2-10.

————, 1889. The Gastropods of the Older Tertiary of Australia —Part III. *Ibid.* 13: 185-235.

————, 1891. Descriptions of new species of Australian mollusca, recent and fossil. *Ibid.* 14: 257-265.

————, 1892. Nine plates illustrative of Professor Tate's paper on the gasteropoda of the Tertiary of Australia—Part 3 in Volume 13 of the society's Transactions. *Ibid.* 15, pl. 5-13.

————, 1893. The Gastropods of the Older Tertiary of Australia—Part IV. *Ibid.* 17: 316-345, pl. 6-10.

————, 1894. Unrecorded genera of the Older Tertiary fauna of Australia, including diagnoses of some new genera and species. *J. Proc. R. Soc. N.S.W.* 27: 167-197, pl. 10-13.

————, 1898a. A second supplement to a census of the fauna of the Older Tertiary of Australia. *Ibid.* 31: 381-416, pl. 19-20.

————, 1898b. On two deep-level deposits of Newer Pleistocene in South Australia. *Trans. R. Soc. S. Aust.* 22: 65-71.

————, 1898c. On some Australian species of Eulimidae and Pyramidellidae. *Ibid.* 22: 80-85, text fig.

————, 1898d. On some recent and fossil Australasian species of Philobryae. *Ibid.* 22: 86-89, pl. 4.

————, 1899a. On some Older Teritary fossils of uncertain age from the Murray Desert. *Ibid.* 23: 102-111, pl. 1.

————, 1899b. A revision of the Older Tertiary mollusca of Australia. Part I. *Ibid.* 23: 249-277, pl. 8.

————, and DENNANT, J. 1896. Correlation of the marine Tertiaries of Australia. Part III. South Australia and Tasmania. *Ibid.* 20: 118-148.

————, HOWCHIN, W., and DAVID, T. W. E., 1896. Evidence of glaciation at Hallett's Cove. *Rep. Australas. Ass. Admt. Sci.* 6: 315-320.

TEICHERT, C., 1943. Eocene nautiloids from Victoria. *Proc. Roy. Soc. Vict.* 55: 258-264, pl. 11.

————, 1944. The genus *Aturia* in the Tertiary of Australia. *J. Paleont.* 18: 73-82, pl. 14-16, text fig.

————, 1947. New nautiloids from the Older Tertiary of Victoria. *Min. geol. J.* 3 (2): 48-51, fig. 1-6.

————, and COTTON, B. C., 1949. A new *Aturia* from the Tertiary of South Australia. *Rec. S. Aust. Mus.* 9: 255-256, pl. 21.

TENISON WOODS, J. E., 1867. On the Tertiary Rocks of South Australia. No. II. The Mount Gambier Fossils. (*The South Australian Register* 29(5795) 1867 (Newspaper)) republished 1867 (?) *Pap. Adelaide phil. Soc.* for 1864-5, 2 pp. 1 pl.

————, 1876. On some Tertiary fossils from Table Cape. *Pap. Proc. R. Soc. Tasm.* for 1875: 13-26, 3 pl.

————, 1877. Notes on the fossils referred to in the foregoing paper (i.e. by R. M. Johnston) *Ibid.* for 1876: 91-116.

————, 1879a. On some Tertiary fossils from Muddy Creek, Western Victoria. *Proc. Linn. Soc. N.S.W.* 3 (3): 222-240, pl. 20-21.

————, 1879b. On some Tertiary fossils. *Ibid.* 4 (1): 1-20, pl. 1-4.

WILKINS, R. W. T., 1962. *Miltha* in the South-Eastern Australian Tertiary. *J. malac. Soc. Aust.* 6: 43-49, pl. 5.

WOODS, N. H., 1931. Pelecypoda from the Abattoirs Bore, including twelve new species. *Trans. R. Soc. S. Aust.* 55: 147-151, pl. 7-8.

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