

DISTRIBUTION

OF

Australasian Volumes.

BY

JAMES C. COX, M.D.

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DISTRIBUTION
OF
AUSTRALASIAN VOLUTES,

BY
JAMES C. COX, M.D.

Reeve observes in his "Elements of Conchology" that the *Volutes* were termed by an accomplished writer the *nobles* of the *Testacea*, just as Linnæus in his admiration of the *palms* called them the *princes* of the vegetable world.

Of a genus, so justly eulogised, the Southern Hemisphere furnishes not only by far the greatest number of species, but the most beautiful and rarest examples.

Seventy to eighty distinct kinds are now only recognised, this restricted number including all the known members of the genus, and of which estimate more than one half inhabit the shores of Australia, Tasmania, New Zealand, and their adjacent islands; but Australia is well called by Angas their metropolis, as many of the most handsome and highly esteemed are found on its coasts, and New South Wales may claim the honour of being almost the exclusive home* of the *Voluta magnifica*, one of the largest and most richly adorned of the whole group. As far as I know, no species of this

* Dr Gray in Dieffenbach's Travels, assigns New Zealand as the habitat of this species, but this assertion is incorrect.

interesting genus exists along the Great Australian Bight; but I may state that specimens of *Cymbium*, the largest shells belonging to the *Volutidæ* proper, are found near Fowler's Bay; but little is known of this coast, and I believe more species will be found there when examined.

"Under the head of *Voluta* Linnæus included all shells having a row of plaits winding round the *Columella*, without considering the nature or habits of their animal occupants. The *Tornatellæ*, whose shells are entire at the base; the *Auriculæ*, which live on the banks of stagnant pools, and are amphibious; the *Turbinellæ*, which inhabit canaliculated shells; and the *Marginellæ*, in which the shell is entirely enveloped by the animal, were all classed in the *Systema Naturæ* under the same generic type, as if identical. This heterogeneous group has, however, been gradually dismembered until those species are only now known as *Volutes* which present the character strictly typified in the well-known *Voluta* (*Scapha*) *musica*, or *vespertilio*. The ancient genus *Voluta* is, therefore, circumscribed within very narrow limits, and some of the species are of such rare occurrence that only a few individuals of the shells of each were, until lately, discovered." Even at the present time, specimens of the *Voluta* (*Scapha*) *pulchra* of Sowerby—the *Voluta* *piperata* of Sowerby—the *Voluta* (*Volutella*) *Sophia* of Gray, and the *Voluta* (*Scapha*) *Maria-Emma* of Gray, are extremely rare.

"The animals of the *Volutæ* have a large muscular disc capable of considerable expansion. The head is furnished with an obtuse trunk; the tentacles are short, broad, and dilated at the base into two lobes; the respiratory siphon is short and stout."

"The species hitherto discovered in a living state, exhibit as brilliant variation of colour in the soft part of the animal as in the shell itself, thus in *Voluta* *vespertilio*, the animal is characterised by a bright yellow disc, marked with longitudinal interrupted black lines."

I may strengthen this observation by stating that the animals of the *Voluta* (*Amoria*) *Ellioti* of Sowerby, the *Voluta* (*Amoria*) *reticulata* of Reeve, and other West Australian *Volutes*, exhibit

* From Reeve's *Con. Icon. and Elements of Conchology*; "Woodward's *Manuel and Chneu's Manual de Conchyliologie*."

similar variations of colouring; but the animal and the shell which protects it, are invariably differently marked, although the pervading tint is the same in both.

"At the Philippine Islands, between two and three hundred species of *Mitra* are known, and only one *Volute*; and almost the same fact reversed holds good on the Australian coast."

The *Volutes* have always been a favourite group with the admirers of conchology, for they present for the cabinet an agreeable variety of form, a lively arrangement of colours, and many are of eminent rarity; their habitats and habits are therefore well worthy the attention of collectors. These, in most instances, have been erroneously given by the naturalists who first described the species, for the shells were procured from seamen who had to visit various parts of this continent, and probably other countries before their voyage was completed, and who, consequently, retained but a doubtful recollection of the exact spot at which their specimens were obtained.

We, therefore, feel indebted to Mr. G. F. Angas for the paper which he published in the Proceedings of the Zoological Society of London, 1864, and in which he carefully points out various new localities where several fine species may be found, and corrects those which had been stated in error.

As I have for some time past paid attention to the marine fauna of this country, *Volutes* especially, and as I am otherwise in a favourable position to afford additional information respecting the distribution of the members of the genus now under consideration, from having employed a collector to search for specimens the coasts of this continent, from Camden Harbour on the north-west, to the mouth of the Albert River on the north-east, as well as those of Tasmania, and some of the islands in the Pacific, I desire to place my experience on record; so that by filling up many of the present existing gaps, I may materially supplement by fresh reliable instances the comparatively limited knowledge we at present possess upon this subject.

Much, however, will still remain to be known; and it is to be hoped that other conchologists who have more time and opportunity to devote to this research, will correct any errors I may have fallen into, and add further information to that now given.

For the facility of reference, I adopt the sectional arrangement of the species, and commence with that shell which is generally esteemed the first in size and beauty.

SECTION SCAPHA.

1.—VOLUTA MAGNIFICA—CHEMNITZ.

In the earlier days of the colony, this species was found abundantly in Port Jackson, but owing to its large size—upwards of twelve inches in length—and attractive colouring, it has been much sought after by many, other than scientific collectors; and, consequently, has become comparatively rare. Although its true home may be said to be from Sydney harbour to Port Stephens, yet it ranges south as far as Jervis Bay, and north to the Clarence River; from the Heads of which latter place, even to Wide Bay, a peculiar variety occurs, distinguished by being more ventricose in form, and more strongly tuberculated.

This beautiful species is still abundant about Port Stephens, and specimens may be got there in very fine condition.

2.—VOLUTA PUNCTATA—SWAINSON.

Was, until last [year (1870), the rarest of Australian Volutes, probably not more than half-a-dozen specimens being known previously. Subsequent to this date, I have received more than twenty examples, all more or less broken, obtained by Mr. Brazier, whom I had employed to investigate the coast, on the beaches which extend from the Clarence River to the Bellinger River Heads, and even beyond to Coff's Harbour; the greatest number, however, being found a few miles to the north of the Nambuccera River. I am not aware whether this species has been found so far northward as Queensland.

The *V. punctata*, when perfect, is a very fine shell, and was first discovered by Mr. Hargraves, between Manly Beach and Broken Bay Heads, so that this locality must be added to the ones above given.

3.—*VOLUTA NIVOSA*—LAMARCK,

Formerly very abundant, but now rare. This shell, aptly named the snow flakes, from its white specks on a ground almost black, has a range from the Margaret River to the South, as far North as Shark's Bay, but is found principally on the beach south of Fremantle, and at Garden Island, in Gages Roads. It is often tuberculated.

4.—*VOLUTA NORRISII*—SOWERBY.

Although found in Western Australia, properly should be considered a North Australian Volute. After passing the North-west Cape it is found plentifully, and although two years ago, it was rarely met with, now it may be seen in every cabinet; and its pecuniary value is little. It affects weedy banks left dry by the tide, which has a fall and rise of even as much as thirty feet near Camden Harbour. *Norrisii* is very plentiful in the neighbourhood of Tien Tsin and the Flying Foam Passage. Mr. Thatcher, at my request, visited this portion of Australia, and he obtained many specimens of this species. The specimens from Camden Harbour are easily distinguished from the westward species, being of a light liver colour; the spots are large and more numerous. The animal varies in colour as the shell is dark or light; the spots on the former are black, and on the latter white; it is the most voracious of the Volutes, and may be always seen crawling in search of food, or busy feeding. The portion of the animal only which fills the aperture has a pattern, the rest being of a uniform colour, identical with the ground colour of its shell.

5.—*VOLUTA MARIA-EMMA*—GRAY,

Comes from the North-west of Australia, as stated by Mr. Gray, as there were over twenty boats working from Exmouth Gulf to near Camden Harbour, and the white crews are always on the look-out, and have had the distinguishing peculiarities of Volutes plainly pointed out to them, and not a specimen of it was obtained. If a naturalist were sent to the new settlement to the north of South Australia, the true habitat of many rare Australian Volutes might be accurately determined, as the coast as far as Camden Harbour to the North-West and the coast westward of the Gulf of Carpentaria have been well explored; the rest of the tropical Volutes whose exact habitats are uncertain, are likely to be found in the space between, such as *V. Sophia*, *V. Maria-emma*, *V. flavicans*, and *V. Tissotiana*, which are more tropical in character than most of the Australian Volutes, and may be obtained in as great numbers as *V. Norrisii* and *Ellioti*.

6.—VOLUTA PULCHRA—SOWERBY.

Is properly named, deserving to rank amongst the most beautiful works of nature. It is, comparatively speaking, a small shell; the largest specimen I know of is in the cabinet of Mr. C. Coxon, of Brisbane, it is over $3\frac{1}{2}$ inches in length. *V. pulchra* is always more or less tuberculated, and has dark violet and brown splashes on a fine white ground. I obtained several specimens of *V. pulchra* from Hobart Town; they were brought from Lady Elliott's Island by a whaler off the East coast of Australia. It is also found on Wreck Reef, and will doubtless be met with in most reefs and patches in that vicinity. As there is danger in approaching the islands and reefs on which it lives, it is always likely to be a rare shell. In the voyage of the Rattlesnake, the late Mr. Macgillivray records having found a specimen of this shell alive on Heron Island, on the North-east Coast of Australia.

7.—VOLUTA WISEMANI—BRAZIER,

Under this name, Mr. Brazier has recently described this species, in the Proceedings of the Zoological Society of 1870, although it so closely resembles the *V. pulchra*, as to have been long mistaken for it; but he considers that it has characters sufficiently different to found a new species on. It is rather a larger shell than *V. pulchra*, and of a pale straw colour, ornamented with bright chestnut blotches, rarely showing the black dots of its near ally, and there is an absence also of the short reddish longitudinal frill of lines below the sutures. The specimens which I possess of this species were collected with specimens of *V. pulchra*, and said to have been obtained from Lady Elliott's Island; but other specimens have since been found on the islands and reefs on the East coast about Port Denison. It is probable that were these islands more visited, it would be found abundantly, as well as *V. pulchra*.

8.—VOLUTA MAMILLA—GRAY,

This species, one of the largest and rarest of the genus, may be considered as a native of the North coast of Tasmania, although specimens have been occasionally found at Broken Bay, on the East coast of New South Wales.

The finest examples have hitherto been procured from the Black River Beach, the Duck River, Port Sorrell, and other localities included between Circular Head and those of the Tamar.

I may observe with regard to its scarcity that although a large price has been offered for live shells, but very few have been obtained; and even dead specimens are with difficulty procured.

This volute has received its trivial name on account of the large swollen nipple on its apex, which is so strongly developed, that Reeve originally mistook it for a malformation.

9.—*VOLUTA FUSIFORMIS*—SWAINSON,

Has also been found on the East coast of Australia, at Broken Bay, and at Twofold Bay; but it is doubtless characteristically Tasmanian, having a still larger distribution than *mamilla* on that Island. It also has claims to rank amongst the most beautiful of Australian shells, not only from its size, but from its gorgeous colouring. It is sometimes over six inches in length, and on a bright yellow ground, has zigzag longitudinal broad markings of dark brown. The *V. fusiformis* (like *mamilla* and *magnifica*) is a deep-water shell, and is only found thrown ashore after gales, during very heavy storms, and for some days afterwards some hundreds are found on the Black River Beach. The shell has little architectural difference, but the lightning-like markings vary greatly. The specimens found at Broken Bay were dead, and are of a very large size, and otherwise are of themselves a distinct variety.

10.—*VOLUTA PIPERATA*—SOWERBY,

This species although described for many years, still continues comparatively a very rare shell, the few genuine specimens which I have seen were obtained at New Georgia Island, Solomon Islands, in company with *V. Ruckeri*; varieties of the latter are not uncommon, where it requires a practised eye to detect the difference; the entire surface of the shell is, as it were, peppered with minute orange brown dots, and short broad lightning-like markings of an olive black running longitudinally. Both this and *V. Ruckeri* must be found in rather shallow water, as specimens were frequently brought by the natives to the ships with the animal in a living state in them.

11.—*VOLUTA DESHAYESI*—REEVE,

A handsome tuberculated species, red, with a thick epidermis, often of a dark brown colour, from the North coast of New Caledonia.

12.—*VOLUTA INNEXA*—REEVE,

Has recently been obtained by Mr. Brazier, from the East Coast of New South Wales, about midway between latitude 30° and 31° South, in the neighbourhood of the Bellinger River. Sowerby defines this species as closely resembling *V. rutila* Mod., but differing from it in being more angular, and having tubercles on the angle, the colouring being similar in pattern, but paler.

SECTION AMORIA.

13.—*VOLUTA ZEBRA*—LEACH,

A small species, generally measuring about two inches long, yellowish white ornamented with almost straight dark chocolate

or black lines, is often obtained in good condition at Broken Bay Heads; I have not known of its being found further south than Botany Bay. It is found most abundantly at Nelson's Bay, Port Stephens, and in fine condition, but it has a range much further north. I have specimens from Port Macquarie, Redbank River, and the Macleay River Heads, and other ports as far north as the Tweed River, on the East coast; possibly it extends as far as Brisbane. I do not consider this species as a variety of *V. lineata*, for the two are in my opinion quite distinct species.—Moreton Bay, Mr. Brazier.

14.—VOLUTA ANGASI—SOWERBY,

Is the only Volute found in any numbers on the Victorian coast. It is considered by Gray only a variety of *V. undulata*, Lam.; it is a small species, from two to three and a half inches long, of a rusty white, with longitudinal flexuous chestnut lines more or less undulated. This species first makes its appearance on the coast of New South Wales, even as far North as Port Macquarie, in great abundance at Port Stephens, and may be traced as far as Broken Bay Heads South, but not of large size, and generally the specimens are dead and beachworn. I have recently had specimens of this shell from below Jervis Bay, a part of the coast as yet too little explored to speak confidently of what species are to be found there; but the great home of this species appears to be on the North coast of Tasmania. Mr. Thatcher found this shell in great abundance from Circular Head to the mouth of the River Tamar. At Corner Inlet and Snake Island, on the Victorian coast, it is also found abundantly.

15.—VOLUTA UNDULATA—LAMARCK,

Is one of the brightest of the marine fauna. Its metropolis is Spencer's Gulf, the best specimens coming from inside Boston Bay (Port Lincoln) and Encounter Bay. The type is from Boston Island, the shell being three inches long, the ground pure white, and the undulated lines stand in bold relief. It ranges along the South Australian coast generally, and extends to the Great Australian Bight. I may here remark that *Voluta undulata* is essentially Australasian, and that it, *V. zebra*, Leach, Port Stephens, *V. Turneri*, Gray, North coast; *V. Elliotti*, Sowerby, *V. Loroisi*, Valen., of West and North-West Australia, and *V. Angasi*, Sowerby, are very much alike, if not the same species.

16.—VOLUTA EXOPTANDRA—SOWERBY,

Is very rare; the only genuine specimens known of are said to be from Port Elliott, South Australia.

17.—*VOLUTA VOLVA*—CHEMNITZ.

Has also a wide distribution, and is found not only on the Western coast, but extends beyond the North-west Cape, where specimens differing little from those of Swan River are abundant. It is a white or cream coloured shell, and in some instances has a few faint lines on the sutures, which never appear on the body, except on what I may term the reverse of the shell, near the columella.

18.—*VOLUTA RETICULATA*—REEVE,

Is a beautiful and much rarer Volute than *Norrisii*. Its range is about from the North of the Ashburton River, to the Westward, to the neighbourhood of Bannangarra Creek on the eastward, a distance of about four hundred miles. It seems to attain its largest growth about Tien Tsin Creek. The crew of the *Argo*, which visited Camden Harbour in 1869, did not bring any of these Volutes; and it is probably very scarce there, or may not extend so far East. I have several varieties of this fine Volute, varying in length from three to five inches, and from a dark fulvous chestnut to a pale grey colour, of a triangularly reticulated pattern.

The pattern of *V. reticulata*, although always a network, differs in specimens from different localities; a band of a darker shade alternates with the groundwork, but in a few rare specimens I have, a light network covers the whole of the shell. The specimens from the farthest West (this shell extends to the North-West Cape) are the smallest—those in the immediate neighbourhood of Tien Tsin Creek are very large. The animal is of a beautiful brown colour, varying as the shell is light or dark brown, with continuous but irregular rows of whitish yellow lines.

19.—*VOLUTA REEVII*—SOWERBY.

There can be no doubt about this being an Australian species, although its exact habitat is not known; I have no doubt it will be found to be on the north-west coast of Australia. So closely is this species allied to the *reticulata*, that it was considered at first by Sowerby only as a variety of that species; but subsequently he created it into a distinct species, and defined it as being a broader shell than *V. reticulata*.

20.—*VOLUTA ELLIOTI*—SOWERBY,

The most purely Australian of all North-west Volutes, evidently a continuation of *Voluta zebra*, of New South Wales, *V. Angasi* of Victoria and Tasmania, and *V. undulata* of South Australia, commences at the North-West Cape, in Exmouth Gulf, and although the first specimens were said to be from Shark's Bay, on

the West Coast, it is probable that they were brought down by an expedition under the command of Captain Helpman, which visited Exmouth Gulf, after working on the West Coast some time. *V. Elliotti* has been known since the first French survey, the commander of which has given French names to many of the islands on that part of the North Australian coast.

The coast between Shark's Bay and the North-east Cape has hardly been visited, and as it is for the most part comprised of high cliffs with a chain of dangerous half-washed reefs running parallel, it is not likely to be the home of members of this family. *V. Elliotti* varies greatly in its markings and form. In the neighbourhood of Tien Tsin the lines are irregularly waved, and its whole appearance resembles greatly that of *Voluta undulata* of Port Lincoln, S. A. The best type is got to the Eastward, having a pure white ground with dark red straight and regular lines. From Barrow Island, some thirty miles from the mainland, off the mouth of the Robe River (Mardo Wallharo of the natives), I have got several small specimens, none of which, however, were adult; the lines were very regular and undulated, but never crossing or touching each other. The animal inhabiting *V. Elliotti* affects the weedy banks, especially those running from the mainland, and at the mouths of rivers, where it may be seen from some distance crawling slowly in quest of food; and being attractive in appearance, is often picked up and kept as a memento of the voyage, after the manner of sailors, and consequently more specimens find their way into the London market than of any other species, including *Norrisii*. At two or three islands, a short distance off the mouth of the Fortescue River, a Volute is found differing greatly from the other specimens or varieties of *V. Elliotti*, they resemble the figure given of

21.—VOLUTA LOROISI—VALLEN.

If Messrs. Crosse and Fischer's plate is correct, this is clearly it; if not, its peculiar form and markings clearly entitle it to be classed as another distinct species of the *Volutæ*. No one with the slightest knowledge of Conchology would mistake one of these Volutes for any other species or variety of *Elliotti*; the shell is not nearly so much elongated, the lines are bolder and broader, and frequently run into each other. Two or three specimens of this Volute were obtained alive at the islands I have mentioned; but immediately on leaving and going west, nothing but the undulated variety of *V. Elliotti* was found.

22.—VOLUTA PRÆTEXTA—REEVE,

Erroneously attributed to North-east Australia, is found in the vicinity of Tien Tsin Creek, on the North-West Coast; there are

two varieties, one of which has a dark reticulated pattern, and may be mistaken at first sight for the young of *V. reticulata*: the true *V. prætexia* has a very light uniform pattern of delicate pyramidal lacework, and, in addition, two bands of crescent-shaped patches running round the body whorl. Good specimens of this beautiful volute are very rare—the specimens I have were obtained from Dolphin Island and round the Flying Foam Passage; none were obtained to the eastward, but the shell being small, it may have been overlooked.

23.—VOLUTA TURNERI—GRAY,

Another of the striped species, much resembling the West Australian Volute in form, is not found at the North-West. It is very likely that this Volute takes the place of *V. Elliotti*, and will be found near the new settlement formed by the South Australian Government in their North Australian possessions; its habitat, I should think, will be found to be North Australia.

24.—VOLUTA JAMRACKI—GRAY.

In 1864, Dr. Gray described this species as *Voluta Turneri Jamracki*, a variety of *Voluta Turneri*. In this I feel quite sure he was wrong, as it is a very distinct species. The shell now referred to has been obtained in rather large numbers at Nichol Bay, on the North-West Coast. In general appearance it resembles the smaller specimens of *Voluta Elliotti*, having a dirty white ground colour ornamented with a number of almost straight longitudinal brown lines; its principal character is its channelled suture.

25.—VOLUTA MACULATA—SWAINSON.

Is confined to the North-east coast of Australia. Commencing at Port Curtis, it ranges as far as Port Denison. It is a rare and beautiful shell, and is generally found with the apex wanting as far as the first or second suture. On Curtis and other islands on the North-east coast *V. maculata* abounds, and lately I have received a good number of fine specimens from Queen's Beach, Port Denison.

26.—VOLUTA LINEATA—LEACH.

This species is considered by Reeve, Angas, and other good authorities only a variety of *V. zebra*, but having obtained a fine series of these two species, I am inclined to adopt the original opinion of Leach, and consider them distinct. The present species is a much larger shell than *zebra*, is much more fusiform, and is less inflated; the lineal flexuous streaks with which they are

ornamented are in *V. lineata* closer, and the groundwork is of a rusty stained colour. The finest specimens of this species which I have are from Curtis Island, but I have also specimens of it from as far north as Port Denison, and others from Wide Bay.

27.—VOLUTA SCIATERI—Cox.

This species Mr. Thatcher first obtained from a shop window in Launceston about two years ago, and which was described by me in the Proceedings of the Zoological Society of London for 1869. It is a white species without any ornamental markings, fully three inches in length. I have lately received many other fine specimens of it unvarying in its characters from an island known as Dog Island, in Bass's Straits. I am given to understand that there is a specimen of this shell in the Melbourne Museum, labelled as *Voluta Grayi*, Cox, but no such species was ever named by me.

28.—VOLUTA KINGI—Cox,

Is a species created from a number of fine specimens I have recently received from an island near to Dog Island in Bass's Straits. It is about $2\frac{1}{2}$ to $2\frac{3}{4}$ of-an-inch in length of the true *Amoria* type, with a bright orange mouth and of a tawny-buff colour on the back without ornamental markings.

29.—VOLUTA AUSTRALIS—Cox,

Is a very beautiful species, of which, so far as I know, only a single specimen has been obtained. It is in the collection of Mr. Hargraves, partaking of the characters of *Voluta Angasi*, and *V. fusiformis*. From information which I have received since it was described, I am assured that its true habitat is the Ninety-mile Beach in Victoria. It is scarcely more than about two inches long, ornamented with a beautiful pattern of very dark longitudinal lines of various width and anastomosing.

30.—VOLUTA HARFORDI—Cox.

This is a rare species which, I believe, is found at Lady Elliott's Island, on the North-east Coast of Australia, but of this I cannot be sure. It is a small fusiform white shell, described by me in the Proceedings of the Zoological Society of London, for 1869, with rows of elongated squarish light chestnut markings, fine opaque white longitudinal lines, and deeply channelled suture. Subsequently to my description, this shell was described as *V. canalliculata* by Professor McCoy, of Melbourne.

SECTION VOLUTELLA.

31.—VOLUTA FULGETRUM—BRODERIP,

Is a native of Spencer's Gulf, although specimens have been found as far as Encounter Bay, and isolated ones have even been met with on the coast of Tasmania. Magnificent varieties with a bright band running round the body, crossing it twice below the sutures, are occasionally found. *V. fulgetrum* is often five inches long, and stout in proportion; its pattern is heavy waved longitudinal chocolate lines on a light yellow ground.

32.—VOLUTA PAPILLOSA—SWAINSON,

Has its habitat about Encounter Bay, South Australia. Specimens there are very rare. The locality where this species is found most abundantly is on the North coast of Tasmania, from the Black River Beach to the Duck River, and sometimes in the vicinity of the Tamar Heads. This species is found abundantly fossil at Circular Head.

33.—VOLUTA FLAVICANS—GMELIN,

A broad, high-shouldered, and not very handsome Volute, is abundant in the neighbourhood of Port Essington. A good many specimens were got by Dr. Creed and the crew of Cadell's expedition of 1867. In pattern and structure it differs materially. The varieties are well illustrated in the Melbourne Museum, where they are arranged according as their tubercules are prominent, small, or altogether wanting.

34.—VOLUTA TISSOTIANA—CROSSE,

At first sight appears a large variety of *V. flavicans*. The specimen I have, and I believe one of the largest known, was found on Crocodile Reef, North Australia, by Mr. Gulliver, botanist to Cadell's expedition, which visited that locality for the purpose of fixing on a site for a settlement for the South Australian Government in 1868.

35.—VOLUTA SOPHIA—GRAY,

Is extremely rare. I possess one of the few good typical specimens known, but by far the finest series of specimens known to be found is in Mr. W. W. Hargraves's splendid collection in this city. Although long described, till recently but very few specimens were known of; no specimens were found by Cadell's party or the pearl fishers of the North-West. In the series referred to as being in Mr. W. Hargraves' collection, we find three important varieties which have characters so closely allied to those of *V.*

nivosa and *Norissii*, that it is difficult to know where to draw the line of distinction; in one the ground colour is light orange,—brown marked throughout with rather uniform round impure white spots, as if the colour had been washed out with drops of rain falling on it. The tubercles of the corona are large, prominent, and widely separated. The bands on the body whorl, formed by the black or very dark brown unconnected spots, are very broad. The black markings radiating from the suture of the spire are long, sharply defined, and wedge-shaped, give a conspicuous and characteristic appearance to this species.

In the other variety the whorl shell has a flesh-coloured tint, and the spots forming the bands are elongated, taking an intermediate form and appearance between those found on *V. nivosa* and *V. Ruckeri*; and it also has the white spots of the first named of those two species, and, except from its shape, it is otherwise more like a variety of *V. nivosa*.

There is a third variety of a smaller size than those before mentioned, where the black marks are very minute and closely resemble the black marks on *V. pulchra*, but in colour it resembles the *V. Norrisii*: in my opinion it is undoubtedly a *V. Sophia*.

My specimen was obtained at Port Essington by the late Mr. John Murphy, whose ability as a collector has, I fear, never been done justice to.

36.—VOLUTA ROSSINIANA—BERNARDI.

This, to my mind, is the finest of the Australian Volutes, of large size, about 6 to 8 inches long, with a beautiful reticulated yellow pattern on a dark ground, found only at Isle of Pines, by the Messrs. Rossiter and Marie; but so far, I can find no record of its exact habitat on that island, which is to be wondered at, considering the interest taken by the many able conchologists who have resided there.

SECTION AULICA.

37.—VOLUTA MARMORATA—SWAINSON.

This species is not so scarce as was supposed, although still it is rare to obtain it in fine condition; it varies much, being in some instances quite smooth on the body whorl, and elongated; in others it is almost coronated: the latter varieties are generally thicker

and shorter shells than the more elongated thin variety. The furthest point south I have known this species to have been found was Long Reef, a few miles north of Port Jackson, where the specimens were small and tuberculated. I have traced it North almost as far as the Clarence River Heads: the finest specimens are from Nelson's Bay, at Port Stephens, where it is abundant, and Balingara Beach, a few miles north of Port Stephens; but I believe it would be found in good condition at the various bays and ports as far as the Clarence, if the coast were not so rough.—*Moreton Bay, by Mr. Brazier.*

38.—VOLUTA RUCKERI—CROSSE.

The principal habitat of this fine species is New Georgia Island Solomon Islands, but I am assured by Mr. Sellers, that it is commonly found in Bongamera Straits, between the Shortlands and Bongamera Isles; and Mr. Rainbird obtained it also at other islands, so that it is probably rather widely distributed among this group; especially at Bucatoo, on the South West end of Ysabel Island. It is a handsome red species, indistinctly banded with large red blotches. When originally described by Crosse, he gave the habitat as Nichol Bay, North West Australia; but this is evidently a mistake, as Mr. Thatcher never found a trace of it when he visited that part of the coast. This species varies much in size and general appearance, some specimens being quite smooth, while others are decidedly tuberculated—varying in length from $2\frac{1}{2}$ to 5 inches long—found in great abundance recently by the Solomon Island traders.

SECTION LYRIA.

39.—VOLUTA MITRIFORMIS—LAMARCK.

Is found in South Australia, principally at Streaky Bay and occasionally at Port Lincoln, and if well looked after, would, I think, prove to be of common occurrence towards the western end of that colony. A species with little specific difference comes from Madagascar. (?)

40.—VOLUTA NUCLEUS—LAMARCK.

Mr. Jukes is given by Reeve as an authority for this species being found at North Australia; and Angus states that he had received specimens from the North-east coast, near Cape York. So far I have not obtained this species from these localities. Mr. Brazier found it in a living state at Newcastle, on the East-coast of

New South Wales; and I had these shells forwarded to me in large numbers from Norfolk Island, having been collected there by Mrs. Adams, since her removal from Pitcairn's Island. I have had the species also from Lord Howe's Island, so that it must be widely distributed. It is of small size, not averaging more than seven-eighths of an inch in length.

41.—*VOLUTA DELICIOSA*—MONTROZIER.

This is another species peculiar to the shores of New Caledonia; it resembles *Voluta nucleus*, Lam. in general aspect, but it is a larger species: its exact habitat appears to be the Île of Art, also on various points of the large island, and at Wantoro Bay, near the Port de France.—*Noumea*, by Mr. Brazier.

SECTION ALCITHOE.

42.—*VOLUTA KREUSLERÆ*—ANGAS.

Was in 1865 added to the list of Australian Volutes by Mr. Angas, as coming from Glenelg, in South Australia. I am not aware that any further additions have been made to any public or private collections since the original specimen was described.

43.—*VOLUTA THATCHERI*—M'Coy.

The specimen from which this beautiful species was first described was obtained by Mr. C. R. Thatcher in a pawnbroker's shop in Collins-street, Melbourne. The specimen was a dead one, and Professor M'Coy had not an opportunity of giving in his original description any idea of the beauty of this species. Mr. Brazier seems to have had a specimen of this shell some time previous to the original specimen being described, but it had been put on one side and overlooked. He appears to have been the first who obtained it from its now well-known and limited habitat—the Bampton Reefs, north of New Caledonia. Many fine specimens of it are now to be found in most of the Australian collections. The largest specimen I know of is about five inches long, of an elongated graceful fusiform shape, ornamented with two yellow-buff indistinct broad bands, one near the tuberculated shoulder of the body whorl; the second about the lower third of the same whorl, and with large squarish markings above and below the sutures. The body of the shell is in fine specimens, closely reticulated, with white pyramidal markings; it has a hard papillary apex.

44.—*VOLUTA PACIFICA*—SOLANDER.

This fine species varies much, being generally tuberculated, but is sometimes smooth; the former varieties resemble very much

specimens of *Voluta ancilla*. The smooth variety seems confined to the Bay of Islands, and the colouring of its pattern is well marked. The more common tuberculated variety is generally distributed all along the Northern shores of the North Island of New Zealand. I have not heard of its having been found at any other locality, not even on the Middle Island.

45.—VOLUTA GRACILIS—SWAINSON.

This species I have one specimen of. It appears rare and doubtless only a miniature variety of *V. pacifica*. It is found at the same part of the Northern Island of New Zealand as *V. pacifica*.

SECTION RUTILA.

46.—VOLUTA BRODERIPI,

Is found on the North-East coast of Australia, more frequently on an island opposite Rockingham Bay. It extends as far as Cape York, but probably not to the Westward, in the Gulf of Carpentaria. It is also found at New Guinea. My collector on the North-east coast at Pera Head did not see any signs of this or any other Volute. This species is the only red Volute on our coast.

SECTION CONO-VOLUTA—COX.

47.—VOLUTA CONIFORMIS—COX.

Shell coniform, whorls ponderous, solid longitudinally, strongly and transversely striated, aperture very short, obtuse, last whorl ventricose, columella with four widely separated small transversely set folds, outer lips simple, extending almost to the spire.

This interesting species I obtained from the crew of one of the pearling vessels which visited Nichol Bay, on the North-West Coast, now about twelve months ago. It is the shape of a cone, but otherwise having all the characters of a Volute, and is well worthy of being created into a new sub-genus (*Cono-Voluta*). It is beautifully marked with a pyramidal reticulated pattern, and peculiarly striated with finely-waved transverse and longitudinal lines. So far as I know, I possess the only specimen yet found

SECTION CALLIPARA.—GRAY.

48.—VOLUTA BRAZIERI—COX.

Shell oblong, ovate thin spire, very slightly raised, acute, fine pointed whorls, smooth, striated longitudinally with lines of growth

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and very finely closely striated throughout transversely with fine marked sculptural lines; apex granular, last whorl large and ventricose, slightly rounded; shouldered towards the apex, and moderately contracted at the base; columella three-plaited, thin, close set, prominent and short, aperture ascending as high as the shoulder of the last whorl, narrow above, much under below, owing to the receding columella; outer lip scarcely thickened; indistinctly banded about the centre with dark chestnut and fulvous bands. dark chestnut, ornamented with irregular buff coloured markings. Length, 1.10th, width, 0.55 of an inch. Habitat Wooli Wooli, Clarence River, East Coast of New South Wales.

Hitherto only a single representative of this genus was known the *Voluta bullatu*, Swain; so that this species will add considerably to the interest of the geographical distribution of our Australian volutes.

49.—VOLUTA HARGRAVESI—ANGAS,

Mr. G. F. Angas has recently described a new volute under the above name; but I am not aware of its habitat or to which section of the Volutidæ it belongs.

