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GIANT FIRE SALPS, *PYROSOMA SPINOSUM*, IN TASMANIAN WATERS (TUNICATA : PYROSOMIDA)

by Elizabeth Turner and Alison Green

Tasmanian Museum, Hobart

On the 10th April 1989, Mr Shane Wisby was pulling craypots into his fishing boat off the Blowhole, near Eaglehawk Neck, south-eastern Tasmania. One of his pots was unusually heavy and, on looking down, he saw a huge object entangled with the rope. He estimated it to be about 25 feet long (7.6 metres), with the diameter of about 0.6 metres and with a "tail" (nearly two metres long) at one end. When it was brought to the surface the object broke into pieces but Mr Wisby salvaged a portion half a metre in length which he stored in his home refrigerator.

Mr Wisby contacted Mr Alex Schaap, of the Department of Sea Fisheries, who relayed the story to Elizabeth Turner. Next day Elizabeth and Ms Kathryn Davidson travelled to Eaglehawk Neck to investigate the find. Earlier guesses at a giant squid or a very large jellyfish were set aside when the specimen was recognised as a relative of salps. Mr Wisby donated his catch to the Tasmanian Museum. (Registration no. D2049). Back at the museum, Alison Green identified the specimen as part of a colony of *Pyrosoma spinosum* Herdman, 1888, following a comparison with an account of this species by Baker (1971).

Pyrosoma, salps and sea-squirts are related animals which used to be included in Phylum Chordata, together with the vertebrates. They do not have backbones but they share some vertebrate characters, such as gill slits. Now *Pyrosoma* and its relatives are in a separate phylum, Tunicata.

Typical salps are single animals, semi-transparent and barrel-shaped, although several salps may be linked to form a chain. In *Pyrosoma* many animals, called zooids, live together in a colony. Each zooid is like a small salp. The zooids lie side-by-side, embedded in a gelatinous wall with their mouths opening on the out-

side of the wall. The colony forms a hollow cylinder with one end open and the other end closed. The zooids suck in sea water, filter out the plankton on which they feed, and discharge the water into the hollow centre of the cylinder. The current then flows from the open end to propel the colony through the sea.

Pyrosoma zooids have luminous organs which glow in the dark so the common name, fire salp, is appropriate. New Zealand divers call large *Pyrosoma* colonies "sea socks".

Thompson (1948, p.85) placed all of the *Pyrosoma* specimens found in Australian waters in one species, *P.atlanticum* Peron, 1804. Pale pink colonies of *P.atlanticum* sometimes wash ashore on Tasmanian beaches. Most examples of this species are not longer than 12 centimetres, although larger colonies do occur. Mr Wisby's *Pyrosoma* from Eaglehawk Neck was enormous in comparison.

Thompson (1948, p.83) listed the distribution of *P.spinusum* as the Indian, Atlantic and North Pacific Oceans. This giant species was recorded from the South Pacific after examples were found off the coasts of New South Wales, in 1967 and 1969, and New Zealand, in 1969 (Griffin, Yaldwyn and Baker 1970). However, *P.spinusum* was not identified from Tasmanian waters until Mr Wisby's specimen was examined in 1989.

Apart from size, *P.spinusum* and *P.atlanticum* differ in some anatomical characters, e.g., in *P.spinusum* the gill slits are set obliquely instead of at right angles to the long axis of the zooid. Also the tail-like process, observed by Mr Wisby, is a feature of *P.spinusum*. The Eaglehawk Neck specimen, when fresh, was orange-pink in colour with dark red spots formed by some organs in the zooids.

According to Baker (1971, p.109) most Australasian examples of *P.spinusum* range between four and 12 metres in length. However, each zooid is not more than two centimetres long. Colonies drift in calm water, down to depths of 40 metres. They break up if they are jolted by waves or removed from the support of water.

In April, Elizabeth Turner contacted Dr George Cresswell, of C.S.I.R.O., to ask about oceanic conditions at the time. He advised that the sea off eastern Tasmania was then 1-2 °C warmer than usual due to a warm current flowing down the east coast of Australia. The situation was similar in the late 1960's when *P.spinusum* was discovered off New South Wales and New Zealand.

After publicity about Mr Wisby's discovery in *The Mercury*, (15th April, 1989), reports were received of three earlier Tasmanian sightings of objects which, very probably, were colonies of *P.spinusum*. These were near the Hippolyte Rocks (off Tasman Peninsula), at Barnes Bay, Bruny Island (in 1988) and at the mouth of the Huon River, (all during autumn).

Now that the identity of the fire salp colony from Eaglehawk Neck has been determined, perhaps there will be more Tasmanian findings of *P.spinusum*.

ACKNOWLEDGEMENTS

The authors wish to thank Mr Shane Wisby, Eaglehawk Neck, for his specimen of *P. spinosum*, Dr George Cresswell, C.S.I.R.O., Hobart, for his information on sea conditions, Mr N.G. Bates, Barnes Bay, and Mr M.W. Wells, Bonnet Hill, for their reports of likely sightings of *P. spinosum*.

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HYPOLEPIS DISTANS — A NEW SPECIES RECORD FOR MAINLAND TASMANIA

by Mark Neyland

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Until 1973 the ground fern *Hypolepis distans* was believed to be a New Zealand endemic. In 1973, Mr P.F. Barnett collected some specimens from King Island which were later identified by R.J. Chinnock as *Hypolepis distans*, (see Chinnock 1976) thus extending the known distribution of the species.

During the course of a survey of non-allocated Crown land around Smithton (Neyland 1988), I collected some material which was forwarded to R.J. Chinnock via the Hobart herbarium and which has been recently confirmed also as *Hypolepis distans*, extending the known distribution of the species to mainland Tasmania. The sample was collected from the eastern edge of the Fourteen Mile Plain, just off Barcoo Road, about 20km southwest of Smithton. (Hunter 1:100,000 Land Tenure Sheet, Grid Ref: 247705).

The Smithton sample was found on the base of a windthrown *Eucalyptus brookerana*, in an area of swamp forest comprising *E. brookerana* over a mixed understorey of blackwood, tea tree (*Leptospermum scoparium*) and scattered myrtle and sassafras. The ground layer was dominated by cutting grass and sags (*Lepidosperma elatius*) and at a later visit in winter the area was partly flooded to a depth of 10cm. The area is therefore similar to that described for the King Island location *Melaleuca squarrosa* - *Leptospermum scoparium* Swamp, Chinnock 1976) and both records accord well with the New Zealand ecology of the species, where it is found in "swampy areas, on peat, in soils with a deep humus

layer, or on decomposing logs" (Brownsey and Chinnock 1984).

The other Tasmanian species of *Hypolepis*; *H. rugosula*, *H. muelleri* and *H. amaurorhachis* are difficult to separate with confidence, however, *H. distans* is quite distinct. The thin (0.7-1mm diameter) stipe which is red-brown in colour (characters from Brownsey and Chinnock 1987) is the most distinguishing feature, as the other three species have thicker (1-5mm diameter) stipes which range from yellow-brown to green at the apices, though they grade to red-brown at their base. Other notable features include the pendulous arrangement of the frond (as the stipe is too thin to support its own weight), the narrowness of the frond, and the veins ending in indentations instead of points.

Whilst swamp forests are not the most attractive places to spend a Sunday afternoon, if you do happen to be wandering around in one keep your eyes open for this rare and distinctive species. The Department of Lands, Parks and Wildlife and the Forestry Commission are currently jointly compiling an atlas of the ferns of Tasmania, and field naturalists throughout the State are invited to contribute. Records are collected using the 10k grid on the Tasmap 1:100,000 (or 1:25,000) sheets. For example, the Hobart G.P.O. is in grid square 52/25 (easting then northing). If in any doubt about an identification, please forward a piece of pressed and dried fertile material with your records for checking. Please forward any records to the author, care of Lands, Parks and Wildlife, G.P.O. Box 44A, Hobart.

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BOOK REVIEWS

A Census of the Vascular Plants of Tasmania

by *A.M. Buchanan A. McGeary-Brown & A.E. Orchard*

Reviewed by P.A. Collier

This publication is the second Tasmanian Herbarium Occasional Publication. The text is in two major sections: a seventy-four-page list of the names of the higher plants which are native or naturalised in Tasmania and an eight-page index to the genera in Tasmania. Such lists form a valuable reference for those concerned with the scientific naming of Tasmania's plants.

The last time that a complete treatment of the Tasmanian flora appeared was in 1903, eighty-six years ago. This was *The Tasmanian Flora* by Leonard Rodway. Being a flora, it includes a full description of the Tasmanian species as well as keys to help with identification. A census includes just the names with no other description and is not useful for identification of plants.

One role of a herbarium is to keep up to date with the current names for local plants. The Tasmanian Herbarium is no exception, and they have kept a list of current names for their own use for many years. The advent of computers in the Herbarium has allowed this list to be published. A computer allows a publication to be set-up ready for printing at a relatively small cost. Additionally the list may be kept up to date very easily and we can expect a revised version to appear before this list is eighty-six years out of date!

For readers familiar with the Tasmanian flora this census may prove both interesting and frustrating. There are a great many names included which do not appear in the incomplete Tasmanian floras published in the last twenty-six years. Without a major literature search, or a patient friend in the Herbarium, it would be difficult to find further details about all of these names. Perhaps the Herbarium can be persuaded to computerise the *Tasmanian Flora*, so that regular revisions can be produced of this valuable reference work as well.

The Platypus: a Unique Mammal

by *Tom Grant, illustrated by Dominic Fanning*

NSW University Press: Australian Natural History Series, rrp \$14.95

Reviewed by D.G. Hird

Since its discovery by Europeans, the Platypus has intrigued casual observers and scientists alike. This provocation of our curiosity has continued through the first proof of oviparity (egg laying) amongst mammals in this species through to a recent discovery of a specialised food electro-location faculty not previously known in any higher vertebrate.

As with several predecessors in its series, this volume is primarily based on an intensive long-term study of its subject by its obviously dedicated author. As such

it contains a wealth of up to date information on life history aspects of the platypus as well as clearly elucidated features of physiology and anatomy. Natural history elements are cleverly presented in a season by season sequence, for example reproductive and feeding behaviours exhibit significant seasonal activity. Interwoven with this are coherent and concise segments on relevant topics such as the unique (with the echidnas) reproductive system and the marked seasonal activity of the male platypus' poison gland.

Tasmania abounds with prime platypus habitat. This has been recognised by naturalists, cinematographers (eg. the *Nature of Australia* platypus sequence) and also some accommodation hosts whose reputation as "platypus guides" has justifiably enhanced their business. Further local interest should follow, it would be interesting to have more details of the known platypus usage of Tasmania's thousands of highland lakes, for example.

As was reported in previous reviews of volumes in this series, production errors are again apparent. The preface includes an unfinished sentence and *mono tremes* (sic) appears as two words on page 7. The bibliographical page doesn't clearly indicate that this is in fact the second, revised edition of the 1984 hardcover edition.

A diversity of readers should nonetheless find this book to be both entertaining and highly educational.

SHELL COLLECTING — FROM CAVEMEN TO KINGS

by Elizabeth Turner

Tasmanian Museum and Art Gallery

The history of shell collecting goes back to prehistoric times and started with the need for implements to cut and carry objects. It was also the beginning of shell ornamentation which continues today.

The first artistic shell representations known are from the Minoan civilization in Crete. Aristototele is thought to be the first person to seriously document descriptions of shells and the habits of the animal inside, while it has been suggested that shells found during the excavations of Pompeii may have been from a natural history collection. Two Roman consuls 100 years B.C. collected shells and the infamous Caligula, while pretending to invade Britain, ordered his men to collect shells after he had marched them battle-style to the shore.

During the Middle Ages early 13th century Dominican monks wrote books on shells and also used them to illustrate the borders of manuscripts.

The 15th and 16th centuries saw a time of great world exploration and soon shells were being brought back as curios from the East and West Indies, the American continent, India and by church missionaries.

Much of the shell trade centred in Amsterdam and Antwerp as ships unloaded exotic cargoes from all over the world. Two notable shell collectors in Holland were the scholar Desiderius Erasmus and the engraver Albrecht Durer.

In the early 17th century Antwerp had become the haven for painters of still-lives and portraits. It was fashionable to have your collection of curios and memorabilia recorded for posterity. Even Rembrandt painted a cone shell, but the engravers reproduced the cone mirror-images, with the opening around the wrong way. This also happened in many of the engraved plates in books depicting shells in the 16th and 17th centuries. (Australia Post did the same with the Textile Cone in their recent marine stamp series).

The first museum with many natural objects was reputed to have been formed by a Swiss naturalist, Conrad Gesner, in the 16th century. Over the following 100 years, large shell collections were made by enthusiasts in Germany, Italy, Denmark and Britain.

Although shells were mainly collected to please the eye, by the end of the 17th century scientific interest had begun to emerge. Books were produced to illustrate shells, but also the first introductions to the science of conchology were written.

Martin Lister, a physician to Queen Anne of England, wrote extensively and produced the "Historia Conchyliorum", which comprised nearly 1000 plates and was the first attempt to arrange shells in some sort of order.

A Dutch contemporary, Georg Rumphius, lived for a long time on the island of Amboina in the East Indies. He was the first genuine field collector and observer, and he recorded excellent descriptions of shells and the animals' habitats.

By the late 17th and 18th centuries, every house of worth in Europe boasted many cabinets of marine life. Some collectors had a real interest in natural history, but for most it was a sign of wealth and intellectual and social status.

Nowhere did this fad take off more than in court society, and collections were often displayed in an extreme manner with opulent surroundings. King Louis XIII had the largest royal shell collection of the 18th century. The French court became so obsessed with the craze that anyone who was anyone outdid the others. Consequently shells exchanged hands for large sums of money.

In the mid 18th century, however, conchology was at the crossroads of decorative curiosity and of science. Although Michel Adanson of France proposed the first classification of shells, it was the Swedish genius Carl Linnaeus who revolutionised natural history. He provided the first and still used system of zoological nomenclature, known as the binomial system, whereby each animal or plant is given two scientific names, which represent a genus and a species. Linnaeus also had a large shell collection of his own and many of these specimens were used by him when describing new species. His collection is now in the Natural History Museum of Geneva.

Linnaeus inspired numerous naturalists during the 18th century and a copious number of books were produced, all adding to the documentation of shells. However, many collectors of the "cabinet" society would not accept the new scientific names. Linnaeus had often unabashedly described new species in anatomical terms. Certain parts of the body were not mentioned in those days,

and considerable embarrassment resulted when collectors had to translate the Latin scientific names into common names for display purposes.

By the mid 18th century so many shells were being brought into Holland by traders that shell cleaning became a recognized trade, employing many people. Filing broken shells and painting their surfaces often caused confusion and brought protests from bonafide naturalists.

The next phase began with the three expeditions by Captain James Cook from 1768-79. The naturalists Joseph Banks and Daniel Solander collected zoological and botanical specimens from all over the Pacific and turned the ships into floating museums. Many new species of molluscs were found and there was a ready market for the shells in Europe.

The French expeditions in the 19th century also provided more new species and information.

The next milestone was the work of the Frenchman Lamarck, who introduced a different scheme of genera, antagonizing the Linnaean purists who though the latter's system was perfect.

At the same time books were published on cleaning shells and the latest equipment. Preservatives improved, replacing the earlier recommended rum and brandy. Collecting became for the sake of science and less for artistic purposes. Also the importance of rare and natural shells was recognized.

The 19th century was the "golden era" for shell collecting and classification. It was considered "gentile" for women to collect and draw specimens. Traders, dealers and collectors were willing to co-operate with naturalists and shell auctions created avid interest. The greatest private collections were formed during this time.

The First World War was to change all this. Very few people had the opportunity, time or money for shells both during the war and for many years afterwards. The shell auctions had almost disappeared by the 1930's, though some collectors and dealers did survive the lean times.

A curious twist in the Second World War came from servicemen stationed on Pacific islands. Many collections were made during this time and some continued into civilian life. Gradually, as the world settled down, shell collecting became popular again. Cars enabled beaches to be visited and improved postal services provided shell dealers with quick trades. Collections are smaller now, but with better material, and wealth and position are no longer necessary.

Unfortunately the current craze for shell jewellery has depleted large areas of seashores, particularly in the Indo-Pacific and the Caribbean. Many regions are now restricted to collectors or totally protected. If the current demand continues, however, some species will not survive and dealers may find their incomes less lucrative.