https://doi.org/10.24199/j.mmv.1983.44.06 30 June 1983

THE CEPHALOPOD COLLECTION OF THE WESTERN AUSTRALIAN MUSEUM

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1. History of the Collection

The cephalopod collection of the Western Australian Museum had its origin in a few dry specimens which had been in the collection of the Perth Museum when, in 1897, its name was changed to the Western Australian Museum and Art Gallery and the cataloguing of its collections commenced.

Additions to this section of the collections was slow at first, but the nucleus of the wet cephalopod collection was apparently formed by some octopus from the Swan River and from Fremantle which were donated by an interested amateur in 1899. The interest of, and the support by the public has been a significant factor in the growth of this collection since that time.

In 1910 and again in 1912 the size of the Museum staff was increased and active collecting began. W. B. Alexander in his position as Assistant in Natural History and later as Keeper of the Department of Biology collected in local waters, and took part in collecting activities aboard F.I.S. *Endeavour* when she visited Western Australian waters in 1912. After Alexander's resignation in 1920 L. Glauert, who had been initially appointed as Assistant in Natural History and Ethnology, and was later promoted to the position of Keeper of Geology and Ethnology, became more involved with marine groups. After being promoted, in 1928, to the position of Curator of the Museum and later to the position of its Director, Mr Glauert assiduously collected on local beaches and encouraged the enthusiasm of local collectors. Active interaction with the public and with Government departments and instrumentalities was further stressed by Glauert's successor Dr W. D. L. Ride. As the Museum entered into a phase of rapid growth, marine collecting programs were carried out in the early 1960's by the Museum's first Curator of Invertebrates, and from the mid-1960's onwards by the staff of the department of Molluscs (later Malacology). Field work within Western Australia, along the coasts of other Australian states and in countries within the central Indo-West Pacific Region (such as Indonesia, Malaysia and the Philippines) has brought about a rapid increase in the size and coverage of the cephalopod collection. Staff members of other marine departments within the Museum have also contributed significantly to these collections both during interdisciplinary surveys and during their own field programs.

Since the Hamburg Expedition to south-western Australia in 1905, foreign workers collecting in our waters have responded to the State's need for reference material. In 1911 Drs Michaelson and Hartmeyer, who had lead the Hamburg Expedition, donated some of their specimens to this Museum. One of these is a paratype of the cuttlefish *Sapia irvingi* described by Meyer in 1909 in the expedition report, *Fauna Südwest-Australiens*. Since that time Hawaiian collectors on board the chartered fishing vessel *Davena*, Japanese scientists with the fisheries research and training ship *Umitaki Maru* and those engaged in fisheries surveys aboard various commercial Taiwanese vessels have donated material, particularly from waters off the northern coasts of Western Australia. Specimens have also been donated by collectors and researchers working in other Australian states, the Philippines, and in Singapore.

Since early 1903 many specimens have been added to the collections because of the interests and enthusiasm of the directors and officers of the WA Dept of Fisheries and Fauna (later Fisheries and Wildlife). The support of this department and the fishing companies with which it collaborates, has provided specimens from the waters off the Recherche Archipelago to those off the eastern Kimberley region during

surveys connected with rock lobster, prawn and scale fisheries and with the policing of foreign vessels inside territorial waters since the early 1960's. More recently, exploratory fishing on cephalopod stocks has provided many specimens and much valuable data from many areas along the long Western Australian coastline. In addition, that Department's provision of ship time for Museum activities has enabled Museum staff to collect in areas from Cockburn Sound to Shark Bay more intensively and with greater attention to detail than would be otherwise have been possible.

Federal departments and instrumentalities have been similarly helpful. Research on the whale stocks which were fished off the southern coast of Western Australia, on the interaction of rock lobsters and octopus at the Houtman Abrolhos and adjacent mainland coast and on the potential scale fisheries in the Great Australian Bight provided a large number of Specimens. Museum staff were able to join the frigate HMAS *Diamantina* on a number of training voyages between 1963 and 1976 and to carry out dredging programs on the continental shelf and slope of the western coast.

In 1976 Museum staff were given time on the CSIRO chartered vessel *Sprightly* to dredge across the shelf, south of the Houtman Abrolhos, resulting in the collection of a number of benthic cephalopod specimens. In 1978-82 Museum staff were given places aboard the CSIRO chartered vessels *Courageous* and *Soela* during voyages to survey the fauna of the North West Shelf. These activities provided specimens from the more shallow waters of the shelf and also specimens of taxa previously uncollected from the deeper waters of the slope.

2. Research work on the cephalopods of Western Australian waters

Records of cephalopods in Western Australian waters date from the 17th century, when descriptions of floating cuttlebones, taking to denote the proximity of land, were made in the area off Shark Bay by an employee of the Dutch East Indies Company and later by Dampier in his second voyage to Australia (*fide* Alexander, 1914). Octopus at Bernier Island, Shark Bay were noted by Péron (1807) during the voyage of the *Geographe* and *Naturaliste* and from Péron's notes, an octopus from nearby Dorre Island was later described by Lesueur (1821) under the name *Sepia boscii*, and later still by de Blainville (1826) under the name of *Polypus variolatus*.

Cephalopods and other molluscs were collected from the western coasts of the continent by P. P. King during his surveys aboard the *Mermaid* and later the *Bathurst* between 1817 and 1822 (King, 1826). His specimens were sent back to Gray in the British Museum who apparently later (Gray, 1849) localised them only as having been taken in New Holland, which was the term commonly applied to that part of the continent west of latitude 135°E.

During the voyage of the French ships *Uranie* and *Physicienne*, a squid was collected in September, 1818 off the coast near Shark Bay (then known as Endracht's or Eendracht's Land) and was later described as *Loligo uncinata* by Quoy and Gaimard (1825), two medical officers who also acted as naturalists.

Following the settlement of the Swan River Colony a German naturalist and collector Dr J. A. L. Preiss travelled during 1839-40 throughout the south western corner of the country collecting specimens. He sent the molluscs home to Menke, who in 1843 published an account of the 263 species he had received, one of which was a specimen of *Nautilus pompilius*, from Port Leschenault (Bunbury)—a locality apparently well south of the distributional range of the species but within the area over which drift shells have subsequently been found.

Germans again visited Western Australia to collect marine specimens in 1875. The *Gazelle* travelled along the north west coast, and dredging operations in Mermaid Strait yielded a myopsid squid later identified by von Martens (1889) as *Sepioteuthis australis* (Quoy and Gaimard).

When Brazier in 1892 published his *Catalogue of Australian Cephalopods* he listed two species of cuttlefish, *Sepia rostrata* and *S. indica* and one species of octopus, *Polypus boscii*, from Western Australian waters. He also recorded the oegopsid squid *Symplectoteuthis oualaniensis* from the pearling grounds of Nicol Bay.

As mentioned above, the report on the cephalopod molluscs collected by the Hamburg Expedition were published by Meyer in 1909. Along with the cuttlefish *Sepia latimanus* Quoy and Gaimard and one tentatively identified as *S. braggi* Verco Meyer described two new cuttlefish, *S. irvingi* from Cockburn Sound and *S. galei* from Shark Bay. In addition he recorded the Western Australian occurrence of the sepiolid *Sepioloidea lineolata* Quoy and Gaimard.

A Swedish expedition lead by Dr E. Mjöberg visited the pearling grounds near Broome and off Cape Jaubert between 1910 and 1913 and the molluscs collected there were reported upon by Odhner (1917). The only cephalopods collected there were four specimens of octopus which Odhner identified as *Octopus membranaceus* Quoy & Gaimard and *O. cuvieri* d'Orbigny.

In 1910-1911 Dr J. C. Verco of South Australia and his friend Dr Torr travelled through the south and southwest of the state. Then in 1912 Verco joined the *Endeavour* under the fisheries biologist Dannevig and travelled to the western part of the Bight. The results of the trawling and dredging operations carried out by this vessel were later published, the cephalopod collections being described by Berry (1918). Verco (1912) recorded *Spirula* from Geraldton, while Berry recorded the cuttlefish *Sepia hedleyi* n. sp. the oegopsid *Nototodarus gouldi* McCoy, the sepiolid *Rossia* (*Austrorossia*) *australis* n. sp., the octopus *Polypus variolatus* and the cirrate octopod *Opisthoteuthis pluto* n. sp. from W.A. waters off Eucla and the cuttlefish *S. dannevigi* from Cape Naturaliste to Geraldton.

In 1914 Robson had published a short paper on two species of cephalopod which had been taken in the Monte Bello Islands and forwarded to him by collectors interested in that area. One was a new species of dumpling squid *Sepiadarium auritum* and the other an unidentified species of *Octopus*.

Just a year later a checklist of the molluscs of Western Australia compiled by Hedley was read to the Royal Society of Western Australia and was published in the following year (Hedley, 1916). This summarised all Western Australian molluscs recorded in the literature as well as those present in the collections of the Australian Museum and the British Museum (Natural History) to that time.

The next contribution to knowledge of this fauna was a paper by Cotton (1929) in which he reported on a collection of cuttlebones forwarded to him by the then Curator of the Museum, L. Glauert. Collected mainly on beaches around Perth and Fremantle, the cuttlebone collection contained ten species. *Solitosepia glauerti*, *S. hendryae*, *S. occidua*, *Decorisepia cottesloensis*, and *Crumenasepia ursulae* were described as new species from this collection, while *Mesembrysepia novaehollandiae* (Hoyle), *M. chirotrema* (Berry), *Glyptosepia hedleyi*, *Arctosepia braggi* (Verco) and *Amplisepia apama* (Gray) were also recorded. Cotton and Godfrey (1940) repeated most of these records.

Robson in 1929 published his massive monograph on the octopods in which he records British Museum specimens of the blue-ringed octopus *Hapalochlaena lunulata* (Quoy and Gaimard) from the Swan River [Colony]. In this publication he also discusses the validity of the octopus species *O. boscii* and *O. variolatus*.

Cuttlebones were again the subject of a paper by Iredale (1954), in which he described the new species *Solitosepia genista* from Broome and *Amplisepia parysatis* from Shark Bay as well as giving new information on distributional range and relationships of other species. Some of this data was obtained from specimens in the collection of the W.A. Museum.

In discussing the fatal bite of an octopus in Darwin, Flecker and Cotton (1955) record the occurrence of *Octopus pallidus* Hoyle, *O. australis* Hoyle, *O. lunulata*, *O. maculosa* Hoyle and *Bentheledone rotunda* (Hoyle) in Western Australia. Their identification of the venomous octopus as *O. rugosus* Bosc was disputed later by McMichael (1964) who identified it as *Hapalochlaena lunulata* and for this species he gave a distribution from the northwest coast of Australia to the islands to the north.

It was at about this time that cuttlebones and some wet specimens of cuttlefish were first sent to Professor Adam in Belgium for assistance

with identification. As more material became available this was forwarded and in 1979 Adam published a paper on the sepiid collection of the W.A. Museum.

In 1966 Clarke's work on oceanic squid was published. Although he did not give details of records (other than literature records) on which he based his distributional data, he did indicate a possible or definite presence of a number of diverse oegopsid squid species off the south of Western Australia. Filippova (1971) again did not give details of locality records though collecting stations of USSR research vessels were indicated off the southwest coast of W.A.

During the latter part of the 1970's L. Joll was publishing the results of his work on the biology of *Octopus tetricus* Gould which had been considered an important predator on the commercial rock-lobster in the south-west of W.A. (Joll 1976, 1977, 1978).

The most recent work on cephalopods of W.A. waters is included in the identification guide to Austraian ommastrephids by Lu and Dunning (1982). Records from the collections of the W.A. Museum have been used in the composition of distributional maps of a number of species which are recorded from the south east Indian Ocean for the first time.

3. Present Composition of the Collection

As of March, 1983 the cephalopod collection of the Western Australian Museum consists of approximately 1100 lots of preserved animals, 400 lots of dry specimens (cuttlebones, *Nautilus* and *Spirula* shells, and egg cases of argonauts) and 800 lots of squid beaks, the latter having been collected from the stomach contents of whales.

The cuttlefish collection is almost completely identified, those specimens which have been added since Adam's work was completed have, in general, only added more detail to the known geographic ranges of recorded species. A few species have had their known geographic range considerably extended.

Some of the sepiolids and sepiadariids are currently being examined by C. C. Lu. Among these are the only known specimens of *Sepiadarium auritum* other than the type specimen.

The octopod collection is largely unidentified. Some of the *Hapalochlaena* collection is being worked upon by G. Voss, and the small collection of *Argonauta* species is identified. The remainder awaits the attention of workers willing to tackle the systematics of this difficult group. This is possibly one of the most neglected areas in molluscan systematics.

The squid collection is considerable and is, in general, fairly well identified. Specimens in the collection in 1975 were identified by C. Roper, and C. C. Lu identified many of the more recently collected specimens in 1981.

Specimens collected between 1979 and 1982 on the north west shelf are of particular interest, particularly those collected from the area of the slope to about 700 metres. Many of these are quite new to the collection and most of those identified indicate considerable extensions in known geographic ranges. It is obvious that a considerable effort needs to be made in sampling this fauna.

Some advance has been made in the state of knowledge about the pelagic species of squid on the continental shelf which have been surveyed for their fisheries potential. However, the benthic fauna of most of the State's continental shelf outside sheltered embayments is virtually unknown, particularly on the western and northern coasts.

The large collection of squid beaks has been and is being worked upon to determine species composition, and to extract other data appropriate to the needs of the International Whaling Commission. This collection of squid beaks has not been accessed into the general collection.

With all groups attention is being given to building up a record of colour notes and particularly of colour slides cross-catalogued to particular specimens.

Type Specimens

Sepia cottoni Adam, 1979: 193-200, pl. 11, figs. 1-6.

Holotype: CSIRO Stn. 46, W of Lancelin, WA (31°54′S, 114°55′E), 114-122 m; leg. HMAS *Diamantina*; 1755 hrs, 5 February, 1964; WAM 435.65: 1♂ in spirit.

+ *Paratypes*

Sepia reesi Adam, 1979: 200-201, pl. 4, fig. 3.
Holotype: Salmon Bay, Rottnest I., WA; leg. L. Glauert; September 1931; WAM 497-76: 1 dry shell.
+ *Paratypes*

Sepia vercoi Adam, 1979: 190-193, pl. 10, figs. 5, 6.
Holotype: CSIRO Stn. 200, W of Shark Bay, WA (25°31′S, 112°29′E), 130 m; leg. HMAS *Diamantina*; 0220 hrs, 9 October, 1963; WAM 441.65: 1 ♂ in spirit.
+ *Paratypes*

Sepia irvingi Meyer, 1909: 333, figs. 7-10.
Paratype: Warnbro Sound, W.A. leg. Hamburg Expedition; (labelled Dec. 1910, presumably collected in 1905); WAM 4203: 1 in spirit.

Bibliography*

ALEXANDER, W. B., 1914. The history of zoology in Western Australia. Part 1. Discoveries in the 17th century. *J. West. Aust. nat. Hist. Sci. Soc.* 5: 49-64.

DE BLAINVILLE, H. M. D., 1826. Poulpe. *Dictionnaire des Sciences Naturelles* 43: 170-214.

COTTON, B. C. & GODFREY, F. K., 1940. *The molluscs of South Australia, Part 2. Scaphopoda, Cephalopoda, Aplacophora and Crepipoda.* Adelaide: Govt. Printer.

FILIPPOVA, YU. A., 1971. O raspredelenii kal'marov v pelagiali mirovogo okeana (The distribution of squids in the pelagic waters of the world ocean). *Izdatel'stvo "Nauka", Moskva.* 1971: 89-101.

KING, P. P., 1826. *Narrative of a survey of the intertropical and western coasts of Australia. Performed between the years 1818 and 1822.* 2 vols. London: John Murray.

VON MARTENS, E., 1889. *Forschungsreise S.M.S. "Gazelle" . . . 1874 bis 1876.* 3. *Zoologie und Geologie.* Berlin.

MENKE, K. T., 1843. *Molluscorum Novae Hollandiae specimen, quod . . . praefuit . . . J. G. C. Lehmann . . . scripsit C. T. Menke.* Hannoverae.

PÉRON, F., 1807. *Voyage de decouvertes aux Terres Australes . . . sur les corvettes le Geographe, le Naturaliste et la goelette le Casuarina. Pendant les années 1800, 1801, 1802, 1803 et 1804 . . .* 1. Paris: l'Imprimerie Impériale.

QUOY, J. R. C. & GAIMARD, J. P., 1825. *Voyage autour du monde . . . executé sur . . . l'Uranie et la Physicienne, pendant . . . 1817-20 . . . Par M. L. de Freycinet. 3. Zoologie.* Paris.

* Much of this section is incorporated with "Bibliography of Cephalopod Biology of the Australian-New Zealand Region". See Roper (1983), pages 23-27, this volume. – Editor's note.