Giant Colonies of Pelagic Tunicates (*Pyrosoma spinosum*) from SE Australia and New Zealand

DURING 1967, reports reached the Australian Museum, Sydney, of very large cylindrical objects drifting in shallow waters off central and southern New South Wales. We shall summarize some of these reports here; a further account will be published elsewhere.

Two of the objects were seen underwater near rocks, one was seen on the surface 5 miles offshore and portions of another were taken from the stomach of a carangid fish (trevally). The largest was estimated to be at least 30 feet long and 3 feet in diameter; the other entire object was about 12 feet long and 3 feet in diameter. Colours ranged from bright pink (underwater observations) to bright red (surface observation). The general shape was elongate, cylindrical, tubular, widest towards one end and gently tapering towards the other. Walls were about ¾ inch thick and the surface was rough and papillate. The 12 foot object was the shape of a whale, although pliable and readily deformed by surface water movements and the 30 foot object had the same general shape and characters[1]. Both were horizontally free-floating. Similar objects were seen on more than six occasions during June and July 1969, and reports appeared in the Sydney press. Estimates of their length ranged from 14 feet to 45 feet and they were about 2 feet across. All were described as cylindrical and pinkish in colour with an irregular surface. These descriptions agree with those received in 1967. Most were seen at the surface, but two, one estimated to be more than 30 feet long and one 3 feet long, were seen by skin-divers 50–85 feet down.

These observations strongly suggest giant colonies of the pelagic tunicate *Pyrosoma*. Berrill[2] has described these colonies as being formed of numerous individuals embedded in the wall of a gelatinous tube, which is usually elongate, more or less cylindrical, closed at one end and open at the other. The individual zooids have their branchial siphons opening to the inside of the tube, which is thus a common cloacal cavity for the colony. Each individual passes a current of water from the exterior into the interior, where all the individual currents form a powerful stream emerging from the open posterior end of the tube. Locomotion is accordingly a continuous jet-propulsion.

The nine species of *Pyrosoma* are placed in two subgenera[3], *Pyrosoma* ("*Pyrosoma ambulata*" of early authors and *Pyrostremma* ("*Pyrosoma fixata*")[2,3]. While all the species have been recorded in the Indo-Pacific, only one species, *P. atlanticum*, is known from the Australian area. This species (with seven named subspecies[3,4]) has irregularly arranged zooids with relatively long branchial siphons opening at the summit of truncate test processes or spines, thirteen to twenty pharyngeal bars and twenty-five to thirty-six rows of stigmata arranged at right-angles to the longitudinal axis of the zooid. Colonies reach a size of about 60 cm[3].

The objects found in 1967 and 1969 were not *P. atlanticum*, and have been identified as colonies of *Pyrosoma* (*Pyrostremma*) *spinosum* Herdman, 1888[5], which has an outer surface covered with pyramid-like (quadrangular) spines. In the zooids, the branchial siphon is surrounded by more than twelve tentacles, the ventral ones being longer than any others. The rows of stigmata are obliquely orientated to the longitudinal axis of the zooid; there are about fifty gill slits and thirty transverse bars. This species has been recorded previously from the north and south Atlantic, Indian Ocean and northern Pacific (Philippine area), but not from the southern Pacific.

There have been some reports of large sea objects that could have been examples of *Pyrosoma*. Berrill's underwater colour photograph of a long cylindrical object, reputedly a large *Pyrosoma*, shows with remarkable clarity (considering the assumed distance of the object from the camera) a close, continuous, spiralling, lineal structure. No pyrosomas are described as looking like this, and colonies in the underwater photographs we have seen do not show any trace of spiral lineation of zooids. The photograph, however, is similar to one of the egg mass of a cephalopod (illustration 93, ref. 7). In 1966, a 15 foot marine monster, called "Marvin", was photographed by a Shell Oil photographer off Santa Barbara, California, at a depth of 180 feet[8]. This free-swimming, cylindrical, striped object, variously identified as a ctenophore, siphonophore or salp, has all the appearances of a large *Pyrosoma* colony.

Colonies of *Pyrosoma*, it seems, can grow much longer than the previously recorded maximum of 4 metres[9]. Two colonies at least 30 feet long and one estimated at 45 feet have been seen off the coast of south-eastern Australia. All these giant pyrosomas, including the previously recorded 4 m colony, have been identified as *Pyrosoma spinosum* Herdman.

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[1] Gillett, K., and Yaldwyn, J. C., *Australian Seashores in Colour*, Fig. 61 (A. H. and A. W. Reed, Sydney, 1969).
[2] Berrill, N. J., *The Tunicata with an account of the British Species*, 269 (Ray Society, London, 1950).
[3] Metcalfe, M. M., and Hopkins, H. S., *Bull. US Nat. Mus.*, **100**, 195 (1919).
[4] Thompson, H., *Pelagic Tunicates of Australia*, 85 (Commonwealth Council for Scientific and Industrial Research, Australia, Melbourne, 1948).
[5] Herdman, W. A., *Rep. Scient. Results Voy. Challenger*, **27**, 12 (1888).
[6] Berrill, N. J., *The Life of the Ocean*, 65 (McGraw-Hill, New York, 1966).
[7] Hass, H., *Expedition into the Unknown*, 72 (Hutchinson, London, 1965).
[8] *The Seahorse*, 2 (2), 1 and 9 (Hydro Products, San Diego, 1966).
[9] Bonnier, J., and Perez, C., *CR Acad. Sci. Paris*, **134**, 1238 (1902).

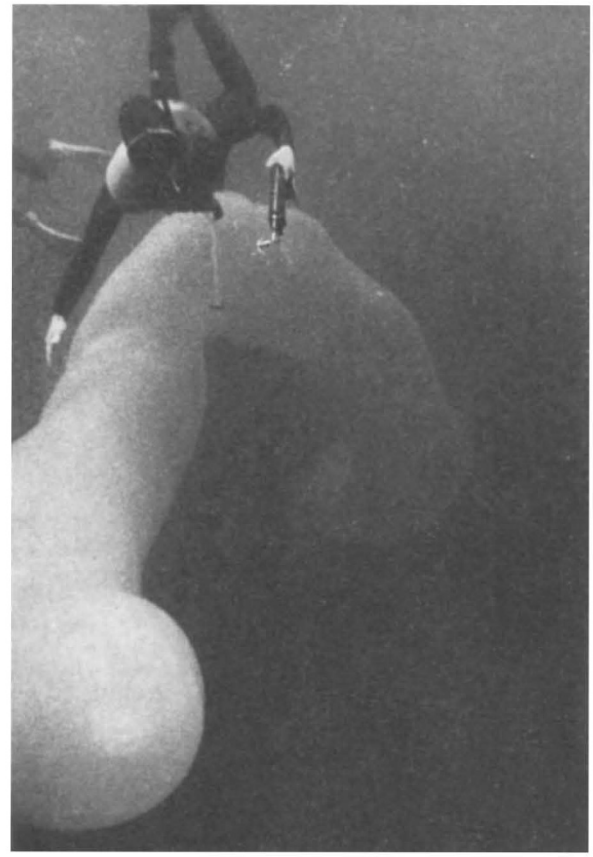

Fig. 1. Giant colony of *Pyrosoma spinosum* seen by University of Auckland students at Poor Knights Is. (35° 28′ S, 174° 44′ E), New Zealand, in October 1969. Length approximately 30 feet; diameter approximately 3 feet. (Photo: V. Grace.)