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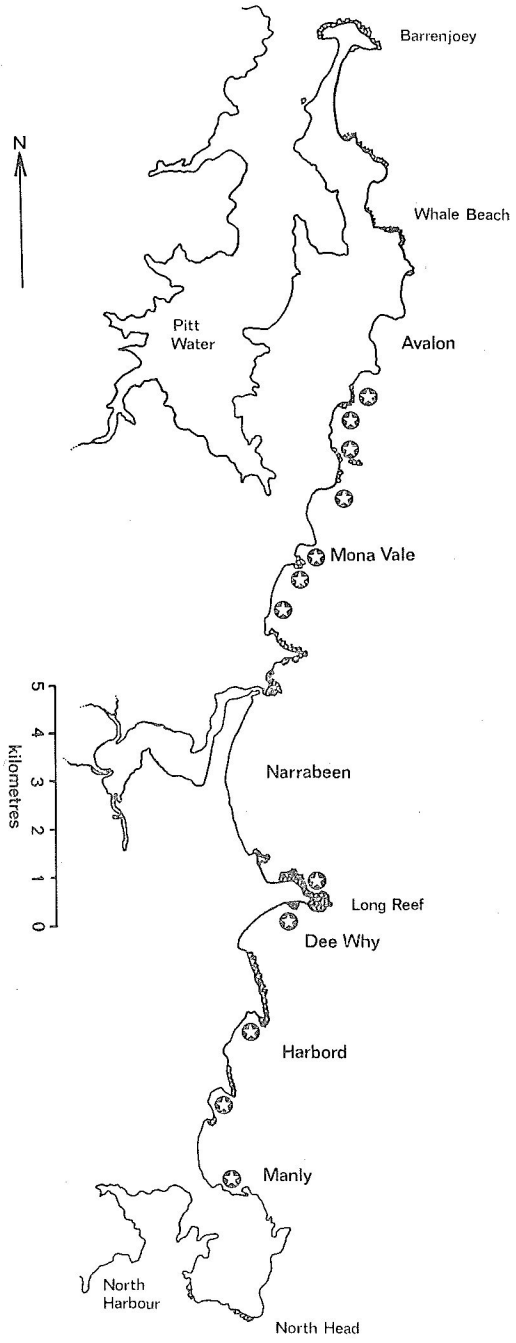

Fig. 1. Region between Broken Bay and Sydney Harbour, N.S.W., showing areas of local dominance of *C. filiformis* between Avalon and Manly.

Plate XI

Caulerpa filiformis

Caulerpa filiformis growing in a dense mass at Long Reef, New South Wales

Photograph by courtesy of Mr David Rogers, State Fisheries of New South Wales

CHANGING DOMINANCE OF AN ALGAL SPECIES (*CAULERPA FILIFORMIS* (Suhr) Hering)

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ABSTRACT

May, Valerie (National Herbarium of New South Wales, Royal Botanic Gardens, Sydney, 1976. Changing Dominance of an Algal Species (Caulerpa filiformis (Suhr) Hering). Telopea 1 (2): 136–138, Plate XI.—This green alga was first recorded from Australia in 1923. Since that time the species has increased in density until now it is the dominant plant on the far edge of the rock platforms just north of Sydney, New South Wales. This change in dominance could be the result of either the acclimatization of an introduced species, or the response of a flora to local increased pollution of the water.

Farnham, Fletcher and Irvine have recently (1973, p. 231) reported an invasion on part of the coast of Britain by an introduced Japanese alga, *Sargassum muticum*. They recall that this species had been introduced earlier to the U.S.A. and now ranges from British Columbia, Canada, to California, U.S.A.

The present note records the changing and growing dominance of a green alga in the environs of Sydney, N.S.W. The alga in question is *Caulerpa filiformis* (Suhr) Hering. (See Plate XI.) This species, which appeared to be occurring naturally in Australia, was recorded for the first time by Lucas (1923, p. 558, pl. 42) from Sandringham, Botany Bay, and as drift at Balmoral, Sydney Harbour, under the name *C. ligulata* Harv., since it was considered to be an extension of range of that South African taxon. May (1938, p. 213) used the appellation *C. flagelliformis* Ag., for this species, following Weber-van Bosse (1898). Papenfuss (1940, p. 201–203) showed that *C. filiformis* includes both *C. ligulata* and *C. flagelliformis* f. *ligulata* Web.-v. Bosse, and thus applies to both the South African and the Australian records.

Collections available to me show that certain serial collections of *C. filiformis* from the Sydney region are as follows:

Locality, observation and date: Long Reef, Ocean headland near Sydney, N.S.W.—Rare, 1963*; Patchy, 1971; Dominant, 1974. Bradleys Head, Sydney Harbour—Occasional, 1934, 1936; Dominant, 1946. Farm Cove, Sydney Harbour—Occasional, 1926; Very prevalent, 1969; Dominant, 1974.

Thus it appears that this plant, recorded as a rarity originally, is now becoming a local dominant, in some communities replacing many other species.

In 1974 a rough survey of ocean headlands near Port Jackson has shown that the region where *C. filiformis* is dominant lies between Manly and Avalon, on the northern side of Sydney Harbour (as shown on fig. 1).† In this area the species is generally established as a near- or major-dominant on flat rocks near or just below L.T.L., particularly on the southern sides of the headlands. It often has quite a lot of sand associated with the attachment organs.

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* "Potholes, just below Low Tide Level, in Sandy Bay, N.E. Corner, 2.1963."

† I wish to acknowledge with many thanks the preparation of the map by Miss C.L. Payne.

On some headlands, e.g., the southern headland of Newport, the *Caulerpa* extends into pools exposed above the L.T.L., while at South Dee Why headland the species occurs, albeit in a stunted form, on more nearly vertical rocks.

The *Caulerpa* is particularly dominant in the central (baths) rock platform at Mona Vale, and on either side of Long Reef. It is almost or entirely absent from the North Narrabeen headland, where, however, rocks such as those on which it develops best, are lacking. The same comment applies to the headlands just south of Sydney Harbour Heads and north of Avalon.

The fact seems established that this species is fast replacing a number of other species in the area described. It could, of course, be an introduced species which is now established and spreading. Its recent excessive development in a localized set of headlands, however, suggests that some altered ecological conditions may be responsible for the change in its dominance. It is suggested that the increasing volume of sewerage discharge at Bluefish Point, North Head, together with the recent growing urban consumption of detergents, has multiplied the waste phosphorus discharged near the affected headlands during the last twenty years; and this increase may have caused the relevant ecological change.

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