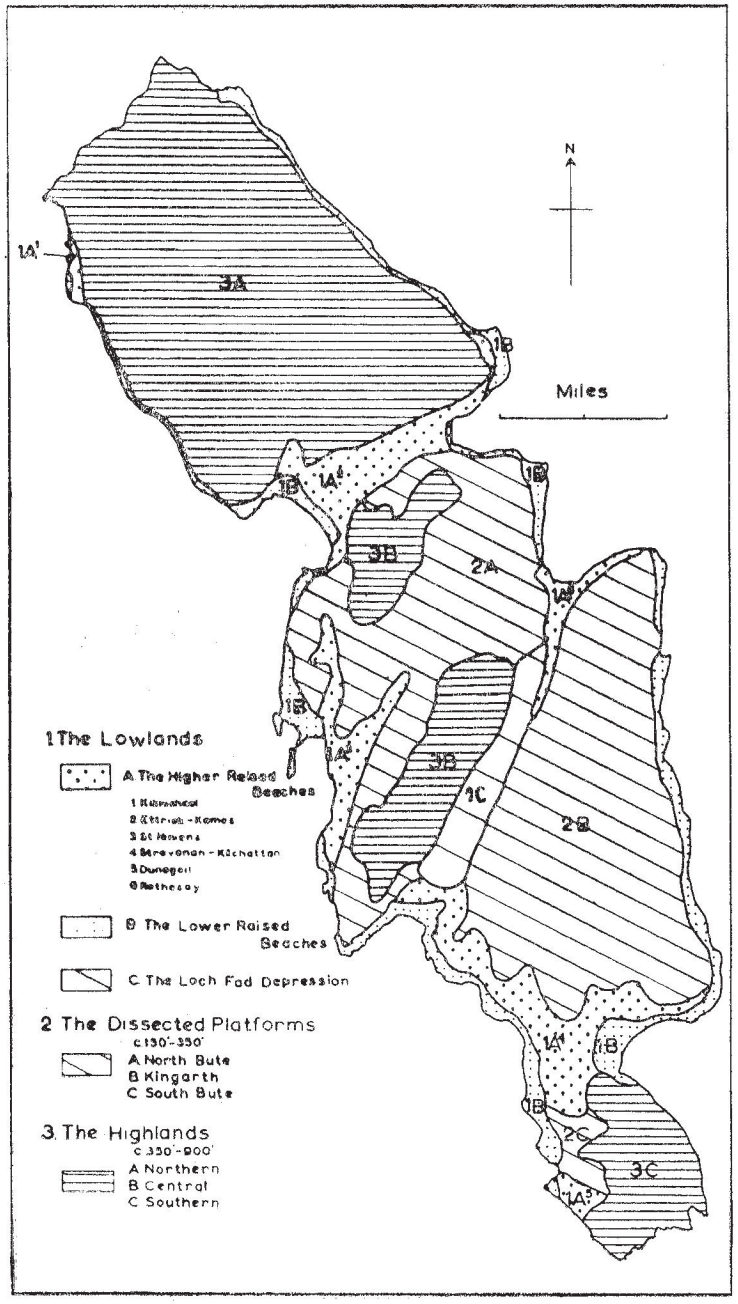

FIGURE 4. The landuse pattern of the Isle of Bute.

THE LOCH RYAN OYSTER BEDS

By R. H. MILLAR, Ph.D.

The most important oyster bed in the south-west of Scotland is in Loch Ryan. Oysters are native in this area, and the presence of shells in a pre-historic kitchen midden at Corsewall suggests that these and neighbouring beds provided food for the inhabitants of Wigtownshire in ancient times. Boece, writing in the 16th century, noted the abundance of oysters in Loch Ryan and Luce Bay, and in 1701 William III granted the oyster rights to the Wallace family, who still retain control of the beds. When the Old Statistical Account was compiled, however, in 1791-99, there seems to have been no organised fishery, for it is stated there that oysters "might be got in great quantities would people drag for them." Although no mention is made of a fishery in the New Statistical Account (1845), it is known that one existed early in the 19th century. In the second half of that century fishing became more intensive and at one time as many as 30 boats were engaged in dredging. Between 1890 and 1900 from 200,000 to 400,000 oysters were being taken annually, but the greatest harvests were in the years just before the First World War, when over a million oysters were sold in a season. This seems to have been overfishing, and the yield from the beds declined steadily until 1954, when the fishery became uneconomic.

When this fishery was flourishing, in the early part of the present century, a steam boat and several smacks were working the beds, and, ashore, large concrete tanks had been built for storing and cleansing the oysters. The decline and final collapse of this industry marked the end of oyster fishing in Scotland, which had once been carried on at several commercially profitable beds on the east and west coasts and in the islands.

This unfortunate situation has interested the Scottish Marine Biological Association for a number of years, and

research has been conducted from the Marine Station at Millport with a view to reviving former fisheries or starting new ones. An important part of this work has been concerned with the Loch Ryan beds. The first step was to survey the area to find more exactly the numbers and distribution of the remaining oysters. This was done by the research vessels " Calanus " and " Mizpah," which made a series of measured dredge hauls to cover as much as possible of the beds. It was found that, although marketable oysters were too few to support a commercial fishery, there were enough half-grown and very young oysters to suggest that satisfactory breeding has continued. The general biological conditions must therefore still be favourable. It was then necessary to amplify this information by following the course of breeding over a period of years, and for this purpose a field station was set up on the shores of Loch Ryan. Each summer a series of pumped water samples was taken at intervals of a few days, and the oyster larvae in the water counted and measured. The spatfall, or settlement of larvae, was estimated by counting the numbers of very small oysters which appeared on clean mussel shell that had been laid on the seafloor for this purpose. During the three years so far covered by the investigation, the settlement of a new generation of young oysters was recorded in 1959 and 1960, but in the cold summer of 1961 breeding was a failure. Similar observations will have to be carried out for several more years before the true breeding potential of the beds can be known, since breeding varies a good deal from year to year.

Another aspect of the investigations has been concerned with the introduction of young oysters from Brittany. In many English fisheries these oysters are laid each spring to be grown for two or three years before being put on the market. Some thousands of two-years-old French oysters were therefore laid in several parts of Loch Ryan, to test growth and fattening. The results so far are fairly satisfactory, indicating that relaid stock might be a useful addition to the native oysters. One thing we do not yet know, however, is whether imported French oysters will

breed as well as the natives. When oysters breed, the female incubates the developing eggs for some time and eventually releases the free-swimming larvae which, if conditions in the sea are favourable, will settle as spat, to establish a new generation. Now we have found that in the imported French oysters, the gonads mature satisfactorily, eggs are fertilized, and larvae are shed just as in the native stock, although a week or two later. These processes have been followed by frequent sampling of the parent stock during the breeding season, but once the larvae are released into the sea, it is impossible to distinguish them from the native larvae. So, up to now, it has not been possible to discover what proportion of larvae of French stock, or indeed if any at all of these, settle as spat.

Along with the experiments and observations on native and imported oysters, a detailed survey is being made of the nature of the sea floor and of the numbers and species of animals inhabiting it. At each of many positions the " Calanus " has taken quantitative grab samples of the bottom. From these the animal species are identified, and the numbers of individuals per square metre are counted. In addition, analyses of the soil of the sea floor are made, to find the varying proportions of sand, silt and clay, at the different collection stations. It is hoped eventually to correlate this information with the relative success of oysters on different parts of the beds.

This work is still in progress, and it is too soon to predict the results, but the information that we have already gathered suggests that conditions in Loch Ryan may be favourable for the revival of a commercial oyster fishery.