

during the search for the American submarine Thresher. The film clearly showed the rather uniform nature of the sea bottom at these depths, and also some fish swimming just above the bottom, apparently not disturbed by the bathyscaphe or the bright lights required for filming.

The reproductive habits of charr of the English Lake District were summarized by Dr W. E. Frost of the Freshwater Biological Association. He found a marked diversity of spawning time and depth of water in which spawning took place, which had presumably originated since the populations were isolated from each other some 12,000 to 14,000 years ago. In Windermere two populations have been shown to exist, one spawning in mid-November in 2 to 3 m of water along the lake shore and in the streams at the head of the lake. The second population spawns from February to the end of March in 20 to 30 m of water on a gravel spit off the mouth of Holbeck. Tagging proved that the fish return to the same spawning grounds each year, and the two populations appear to be separated only by their breeding habits.

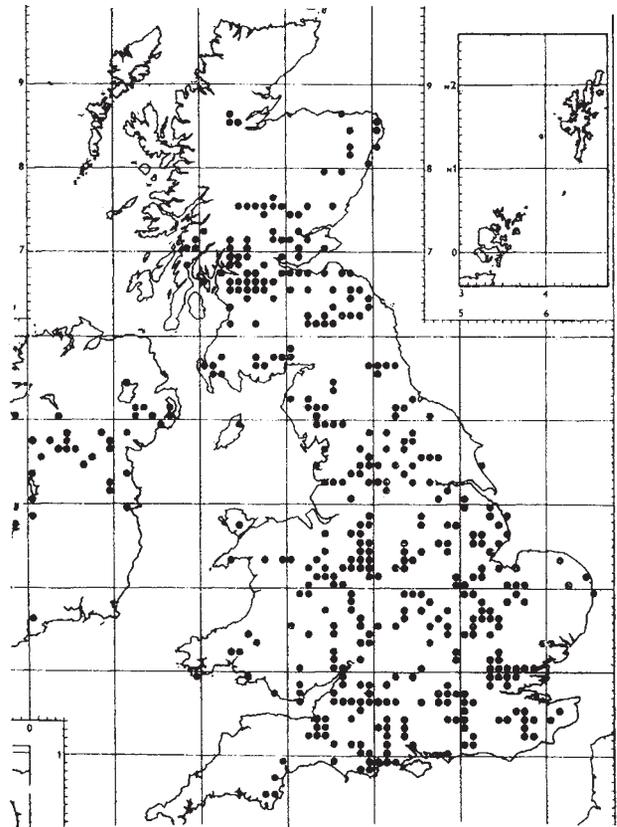
In the other seven lakes containing charr in the Lake District, investigations were carried out to find out whether two populations existed. In Coniston Water a March spawning population was found, and in Ennerdale Water the charr spawned in the autumn in the lake and also in the River Liza at the head of the lake. The five other lakes containing charr—Thirlmere, Hawes Water, Buttermere, Crummock Water and West Water—were found to contain populations which spawned in the middle of January in deep water.

FISH DISTRIBUTION

Which Fish Live Where?

SOME interesting and surprising results are emerging from the scheme to map the distribution of freshwater fish in the British Isles. Two species new to Scotland have, for example, come to light, and several species are being found in areas from which they were previously thought to be absent. The scheme, started at the beginning of 1967, is being organized by Dr Peter Maitland of the Nature Conservancy's office in Edinburgh. His aim is to have a list of the species of fish occurring in each of the 3,500 ten-kilometre squares of the Ordnance Survey National Grid so that distribution maps for each species can be prepared. This is not such an easy task as it may sound, because each square may contain thirty different species or more. The information now being collected in different parts of the country is recorded on specially prepared cards and it eventually finds its way to the Biological Records Centre at Monks Wood Experimental Station near Huntingdon.

The response to the scheme seems to have been good, and Dr Maitland estimates that between 200 and 250 have contributed records. Some of the river authorities have been particularly helpful and have offered to complete a card for every 10 kilometre square in their areas, some of which involve more than 100 squares. At present there is enough information to produce a preliminary map for each species known to occur in the British Isles and it is hoped to publish a complete list of these maps about the middle of next year. There are still, however, several gaps in the



Preliminary distribution map of the occurrence of the common perch *Perca fluviatilis* in the British Isles.

records. For example, there are very few records of the distribution of the common species in very remote areas such as north-west Scotland and parts of Ireland and Wales; and for rare species, the authenticity of many of the records needs checking because of the lack of specimens. Apart from its inherent interest, this project does suggest that it may eventually make possible answers to questions such as the way in which fish are likely to populate the proposed barrage across Morecambe Bay.

CROP BREEDING

Growing New Hybrids

from a Correspondent

ON September 4-6 the National Vegetable Research Station at Wellesbourne near Warwick was host to a specialist meeting of the Horticultural Section of Eucarpia. Of the forty-six participants, all concerned with *Brassica* improvement, twenty-one were from Holland, France, Denmark, Sweden and the United States.

After the opening address given by the president, Dr O. Banga from Holland, a wide range of subjects was considered. M. Nicuwhof from IVT, Holland, discussed results obtained with single-cross and double-cross hybrids and explored the possibilities they suggested. Speaking about the same topic, J. Y. Blanchet from Clause, France, discussed the hybrid breeding scheme which is being developed and the difficulties involved. Similarly Mrs J. Hoser Krauze from Shiernewice, Poland, described progress and problems