

The subsequent history of these nine females is very interesting indeed. The first moulted on the 27th December, 1908, thirty-four days after hatching the last egg. The other eight moulted during January and early in February, 1909. One had spawned again some time previous to the 12th March, and all had spawned again by the 15th April, 1909. Seven of them are therefore now carrying eggs for the third year in succession. The other two did not spawn after their moult in January, 1907 (no doubt owing to the absence of males), but are now carrying eggs for the second year in succession.

There is still a considerable diversity of opinion in Europe as to the frequency of moulting and spawning of the lobster. The generally accepted theory is that of biennial spawning—that is, that a given lobster spawns only once in two years, with one intervening moult. Several workers point out the probability of a lobster carrying eggs two years in succession, but without an intervening moult, the supply of spermatozoa which remain in the spermatheca owing to non-moulting being sufficient to fertilise the second crop of eggs. This is known to be frequently the case with the crab (*Cancer pagurus*), and it has been proved that a single impregnation suffices for all subsequent spawnings in the case of at least one species of crab (*Callinectes*). Professor Herrick states that the American lobster (*Homarus americanus*) spawns only once in two years, his reasons for this deduction being that several months are required for the complete hardening of the shell; newly laid eggs are not found on a soft-shelled lobster; moulting does not occur whilst the eggs are on the swimmerets; and a dissection of a lobster that has just hatched her eggs shows that the ovaries are in an immature condition, and that eggs will not be yielded until the following year. This theory is also strengthened by the fact that the proportion of berried hens during the incubatory season is only 36 to 40 per cent. of the total number of females captured. During the experiments conducted at the Marine Laboratory at Dunbar by Dr. Williamson only one lobster was known to spawn. The lobsters were confined in small wooden tanks, which necessitated frequent handling for cleaning purposes. The experiments were continued over a period of three years, and, although nearly all moulted several times, no other case of spawning occurred. The proportion of berried hens to the total number of females captured was found by Professor Ehrenbaum, at Heligoland, to be from 35 to 40 per cent., and by Dr. Cunningham up to 50 per cent. off the coast of Cornwall.

That these statistics are of much value in arriving at a definite conclusion as to the number of berried lobsters existing in any locality is open to question. The egg-bearing lobster is much more cautious in its movements than the males or when it is not egg-bearing, and as a rule it is very reluctant to leave its shelter. Its movements are much slower owing to the position of the abdomen, which is almost always folded under as a protection to the eggs, and they are very rarely seen about the pond or at any distance from their shelter unless evicted by a male or an unberried female. It may thus quite easily happen that, although there are large numbers of egg-bearing females in a certain locality hidden away in the crevices of the rocks, very few of these are caught at any little distance away from their hiding-places, and the few that are captured would not represent a true proportion of egg-bearers at that time or place. Whilst in charge of a three-months experimental trawling expedition for the New Zealand Government during the months of June, July, and August, 1907, large numbers of crayfish (*Palinurus edwardsii*) were taken at various parts of the coast of New Zealand and at the Chatham Islands. As many as twelve sacks were taken at one haul. Almost every one of these was examined by myself and Mr. E. R. Waite, of the Christchurch Museum, and we failed to discover a single female. The eggs of the crayfish hatch during November and December, and the greatest proportion of the females should be egg-bearing during June to August. Our experience during the past three years has shown that moulting takes place in the early summer, November and December; coition follows within a few hours; the eggs are laid about two months later, and are carried under the abdomen attached to the swimmerets for between nine and ten months, under local temperature; hatching taking place in the following year, in the same month as each individual had previously moulted. The next moult occurs about one month after the hatching of the last larvæ, another batch of eggs being spawned as before—that is, about two months after the moult. From this it will be seen that the whole process is performed in thirteen months in our waters; but it is highly probable that the extra month is accounted for by the low winter temperatures of our shallow ponds and the consequent retardation in the development of both the external and ovarian eggs. I have not been able to obtain particulars of the daily temperatures experienced around the English coast, and am therefore unable to institute a comparison, but in a private letter from Mr. H. C. Chadwick, Curator of the Biological Station at Port Erin, Isle of Man, he states that the lowest temperature is 40° Fahr., in February. The following are the maximum, minimum, and average monthly temperatures (in degrees Centigrade) of the spawning-pond from moult to moult:—

Month.	Maximum.	Minimum.	Average.	Month.	Maximum.	Minimum.	Average.
November ..	12.4	8	11	May	8	5	6
December ..	16.8	11	13	June	5.8	2	4.2
January ..	15.4	10	13	July	5.2	1.4	3
February ..	14.4	11	12.5	August ..	3.8	1.2	3
March ..	11.8	10.2	11	September ..	8.4	4.8	6
April ..	12.2	6.4	9.4	October ..	9.8	8	8.5

The fourteen females and seventeen males of the last shipment were of smaller size than the previous lots, their average length being about 8½ in. These were placed in the No. 2 pond on