A more detailed report of this study will appear in the *Journal of Infectious Diseases*.

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THE EFFECT OF TEMPERATURE ON THE NUMBER OF SCALES IN TROUT

IT has long been known that fish from southern localities usually have a smaller number of scales than those of the same species from farther north, and it has been assumed that the decrease in the number of scales is due to the higher temperature under which the individuals develop. While some writers postulate a theory of selection of those individuals which are best constituted to meet the temperature conditions of the environment, others have proposed a direct effect on the integumentary system. As far as the writer is aware, no one has previously demonstrated from the experimental side that the number of scales can be directly modified by temperature. During the past summer an experiment was conducted on the eggs and alevins of Kamloops trout (Salmo kamloops) to determine the effect of temperature in this respect. The index chosen to specify the number of scales was a count of the number of oblique, parallel rows running in a downward and backward direction from the dorsum to the lateral line. The series begins just behind the head and ends at the termination of the vertebral column. Kamloops trout of Kootenay Lake were selected for the experiment. These trout have an average index of 145 rows with a standard deviation of about 6 rows; the total range is 130–160 rows. Eggs were obtained for the experiment on May 23 from fish at the end of the spawning run. Six pairs of trout were selected and the eggs of each pair were kept separate. The alevins and fry produced from these were reared in the hatchery at Nelson, B. C., under the ordinary hatchery temperatures. The water temperature in the hatchery begins to rise from the stationary winter level (1°–2° C.) at the end of February. It rises continuously until the end of July or the first week in August when it is 12°–13° C. The eggs from the end of the spawning run thus develop under warmer temperatures than the eggs from the earlier part of the run. The average index for each of the six lots of fry was in every case below the lower limit of the standard deviation for the normal population (below 139 rows). In each case the index of the offspring was significantly below the counts for their own parents. This part of the experiment indicated that the individuals having a low scale count in the normal population are probably produced from eggs which have been deposited at the end of the spawning run and have, consequently, developed at a higher temperature. In order to check this theory a random sample of eggs spawned during the middle of the run was removed from the hatchery on June 24 at the eyed-egg stage. These were reared at a temperature approximately 5 Centigrade degrees above that occurring in the hatchery until August 10, when the warmer temperature was discontinued. In these fry the average number of scale rows was reduced by 10 from the normal average for the population. A corroborative experiment was carried out with the eggs from one of the six pairs mentioned above. The eggs were divided into two lots:

Lot 1 was reared at ordinary temperatures. The resulting fry had a scale count of 132 rows on the average and were 13 rows below the normal population—16 rows below the female parent and 17 rows below the male.

Lot 2 was reared at the higher temperature, namely, 5 Centigrade degrees above normal. The resulting fry had an average scale count of 127 rows or 18 below the normal average and 21 and 22 rows below the female and male parent respectively.

From these experiments it seems evident that in Kamloops trout the number of scales is directly modified in an inverse manner by temperature, the higher the temperature, the fewer the scales. The data will be more fully presented and discussed in a forthcoming paper.

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