

tarries there. An examination of 200 spawners taken from the rapids in 1918 by Mr. Robertson, the clever Superintendent of the hatchery on Harrison Lake, failed to yield a single fish which had been spawned elsewhere. Not one of the 200 could be confused with those constituting either the Morris Creek or the Birkenhead colony, and not one of the fish taken on the rapids was found among the 400 specimens taken at Morris Creek, and over 200 from the Skookumchuck and the Birkenhead. No Morris Creek strays were found in the Birkenhead and no Birkenhead fish were found in Morris Creek, in spite of the fact that the Birkenhead fish had all passed close to the mouth of Morris Creek on their way up. In these cases the law of segregation is most strictly in force, yet it seems impossible to imagine a locality better suited to straying of the spawning fish with resulting mixture of populations. That it does not occur here gives confidence that the same law rules everywhere, though the evidence of it may be less compelling.

The most interesting colony of the Harrison, Dr. Gilbert shows, is the one which spawns late in the season at Harrison Rapids. The nature of that spawning area is in itself highly unusual. The spawning habits of the sockeye have been shown to be rigidly fixed. Unlike other species, they must resort to a lake, and fail to frequent streams save during their migrations. They spawn in lake tributaries or on the gravel shores of lakes. Their young develop in the waters of lakes and commonly reside there over a year before migrating to the sea. Of the few which descend from lakes to the sea, few ordinarily survive to return at maturity. But the Harrison Rapids spawners use gravel-bars in the main river and there is no lake between them and the sea. Their young, in consequence, have no lake to drop down to. They have, Dr. Gilbert shows, adopted the highly exceptional method of life for a sockeye, of migrating to sea as soon as they are free-swimming and before their scales have begun to grow. No data is obtainable as to the percentage of survival, but enough have survived to keep the colony flourishing. This is apparently not true of the sockeye of any other spawning area of the Fraser. It demonstrates, however, that under the spur of necessity a sockeye colony can adapt itself to the habit of sea migration in the early free-swimming fry stage, a rare habit in sockeye, though a characteristic of pink and chum salmon and frequently of the spring. The 200 specimens of Harrison Rapids spawners taken and examined in 1918 had all gone to sea in the fry stage. Not one of them exhibited in the centre of its scale any trace of growth in fresh water. The scales from all others taken from different spawning areas recorded growth in fresh water of a year or more. In 1918, as in 1916, Dr. Gilbert failed to find any individuals of sea-type spawning in any part of the Fraser basin other than the Harrison Rapids, though upwards of a thousand specimens from other sections were examined. The fact that no sockeye of sea-type was discovered elsewhere in the basin, when coupled with the further fact that every Harrison Rapids sockeye belonged to the sea-type, furnishes the strongest possible evidence of the return of spawning sockeye to their native districts.

Dr. Gilbert's paper is reproduced in the appendix of this report, together with reproductions of microscopic photographs of the centres of thirty-four scales of sockeye salmon taken from many sections of the Fraser River basin, the markings of which demonstrate that in the Fraser the sockeye returns to spawn in the identical tributary in which it was hatched.

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