

IRREGULARITY IN THE GROWTH OF THE SALMON.

BY M. ALLPORT, F.L.S., F.Z.S., &c.

(Read 8th October, 1872.)

In the proceedings of the Zool. Soc. of London for 1870, Part 1, which reached our library only a few weeks back, I find a paper by Dr. James Murie, F.L.S., Prosector of the Society, entitled "Additional Memoranda as to Irregularity in the Growth of Salmon," so completely bearing out my often expressed conviction that the difficulty of determining the various species of the salmonidæ from immature specimens amounts almost to an impossibility, that an extract may prove interesting

Dr. Murie's paper refers more particularly to two fish, reared in the Zool. Gardens, and figured in F. Z. S., 1868, Plate xxiii. In the present paper full details are gone into showing the grounds for believing these fish to be the young of true salmon (*S. salar*), the weak places in the evidence being also fully pointed out. On the whole, the evidence seems in favour of these fish being genuine salmon, and this view is curiously confirmed by the wonderful resemblance between one of these fish and the specimen in our Museum, hatched from the eggs of *S. salar*, which specimen died, after being detained in fresh water for two seasons, after first assuming the smolt scales. Dr. Günther, after a careful examination of the two English fish, came to the conclusion that they were *not* young salmon, but probably hybrids, and based his opinion (amongst other reasons) on the fact that the number of the pyloric appendages in them differed from that found in *Salmo salar*. After a most elaborate consideration of the subject in all its details, Dr. Murie says:—

"It seems to me also a legitimate inference that the two fishes reared in our aquarium are Salmon, inasmuch as they differ in a far greater degree from all other European species than from *S. salar*. Indeed, as is broadly admitted in the British-Museum Catalogue, p. 3, of the genus *Salmo*, 'The almost infinite variations of these fishes are dependent on age, sex and sexual development, food, and the properties of the water;' hence this very same reasoning which demonstrates peculiarities in the two Salmonoids and brood in question, logically points to their immaturity, retardation, or masking of the normal adult characters of the species. If their entire growth has been prejudicially influenced by continuous retention in fresh water, so may a defect or abnormal number of scales (two transversely) and pyloric appendages (three or four) be but the concomitant effect of unnatural development."

With this paragraph of Dr. Murie's paper I was much struck, because early in 1871 I sent to England a salmon trout (*S.*

trutta) which had been hatched from an English ovum, and which had spawned in this colony, after being unnaturally detained in fresh water, and Dr. Günther wrote to Mr. Youl in reference to this fish as follows:—

“(1.) The larger specimen is very interesting ; it is a female fish, with the ovaries well developed. With regard to the external characters, it agrees perfectly with the migratory sea-trout ; it has the dentition and scales, caudal fin, and præoperculum of that species ; it shows also ten parr makes, a number met with only in migratory species.

“On the other hand, it has only thirty-six pyloric appendages, a number which I have never met with in purely bred migratory salmonidæ, but very commonly found in the river-trout and hybrids between river and sea-trout. (See my Catalogue of Fishes, &c., p. 27.) I think that this specimen does not serve to convince the sceptical that one species of migratory salmon will thrive in fresh water. The coloration of this specimen is altogether peculiar, and I have never seen a fish marked with spots so deeply black, so large, and so numerous as in this specimen. In ordinary sea-trout of the same size the parr marks would have disappeared, but here they are present, and their co-existence with the black spots gives to this specimen quite a peculiar appearance.”

On the 1st August, 1871, I wrote Dr. Günther the following letter:—

“Mr. Youl kindly sent me a copy of your remarks on the salmonoids, last sent to the Zool. Soc. I feel personally greatly obliged to you for the trouble you took in examining them, and see no difficulty in reconciling the peculiarities of colour in the large specimen with the fact of its being a salmon trout, the presence of parr marks is due entirely to the unnatural detention in fresh water. Here we detained a few smolts of the salmon (*S. salar*) in the same way, and the parr marks returned after the season for migration was past, but the fish never arrived at the plump healthy appearance exhibited by the salmon trout under the same circumstances. I cannot at all account for the deficiency in the number of pyloric appendages, but have found the number exceedingly variable in specimens of *S. fario*. Do the number vary at different ages? Would the detention in fresh water cause the normal number to diminish?”

“One of the parent fish, a male, died 12 months before that sent to England. I carefully counted the pyloric appendages, and found 47.”

It will thus be seen that I had myself arrived at much the same conclusion as Dr. Murie, as to the doubtful value of the number of pyloric appendages as a specific test. As Dr. Murie specially solicits information from pisciculturists at home or abroad, I purpose sending the specimen of salmon smolt which died after the long detention in fresh water, for his inspection.