

**171.—NOTE ON THE REGENERATION OF THE SCALES OF THE GERMAN CARP.****By JOHN A. RYDER.**

In the early part of 1884 a fine specimen of the German carp, of the mirror variety, was brought from the carp ponds to the Armory Building, where it was placed in one of a number of large aquaria. Unfortunately in handling the specimen, which is now nearly 18 inches long and 5 inches wide, one of the largest scales of the large lateral series was knocked off, so that after a careful examination the writer expressed himself satisfied that the injury received by the fish was considerable, and that there could be no doubt that nothing of the scale remained, though it is probable that the "bed" or tissue from which the scale grew was preserved, but the outer investment of the scale was almost altogether gone. The scale in question was situated just behind the right operculum, and was nearly or quite an inch wide vertically.

Dr. R. Hessel, who was present when the scale was knocked off of the fish, picked it up and kept it. There is therefore no doubt whatever that it was wholly removed.

After about five months have elapsed, or at the time of the present writing, an examination shows that a new scale has been formed in the situation where the first one grew, similar in form to the old one, but apparently thinner, the outer skin investing it being also less densely pigmented than that which covers the scale in a corresponding position on the opposite side of the body.

When the scale was first lost the surface from which it had been removed was congested, though the irritation in the vicinity seemed to subside after a fortnight or thereabouts, so that but little evidence of the injury remained, except the whitish appearance of the skin where the scale was originally situated. It is still lighter in color, but is otherwise perfectly healthy, though the fish had been for a time infested with fungus, from which it recovered entirely, in spite of the fact that an abraded surface was exposed which would render it more liable to succumb to the inroads of the vegetable parasite.

To what extent the scales of fishes may be regenerated, and under what conditions, the writer is not able to say, but there is no doubt whatever that such regeneration sometimes occurs, as in the case cited above. Without taking the trouble to look up the literature relating to the regeneration of the scales of fishes, of which there does not, so far as he is aware, seem to be much, the writer has thought the foregoing well-authenticated case of the regeneration of these structures worthy of record, so that others might be profited in case it should be desired to investigate the subject still farther. It is doubtless true that, as in the case of the nails, where if the underlying epidermis

or "nail bed" is lost the nail does not again grow out, so in the case of the fish, if the entire investment of the scale, both internally and externally, was removed the latter would not be formed again.

This observation has some slight practical value, since in the transportation of young carp it frequently happens that the scales which, as in many fishes, are not firmly embedded in the superficial layers of the skin, are accidentally removed in handling, even when considerable care is exercised, to the apparent injury of the individuals. If it is true that under ordinary circumstances scales which have been lost without impairing the tissue from which they have been formed are again produced in the situation and of the same size as the scales which have been removed, then it is evident that such an injury is not very serious, even if not desirable, and that it will not very greatly interfere with the growth and health of the young fish.

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#### 172.—THE STURGEON FISHERY.

By H. C. HOVEY.

In the month of May, when sturgeon most abound, the market is usually supplied with other and choicer varieties of fish. Hence, until recently, this really valuable food-fish has been neglected and its commercial importance underestimated. This difficulty has been met and overcome by the enterprise of New York packers. The process consists in placing the sturgeon, as soon as caught and dressed, in a large freezer, where, by a patented method, they are frozen solid as they lie in boxes. This process is so perfected in the works at Salem, N. J., that 125 sturgeon, averaging 85 pounds each when dressed, can be frozen every seven hours. The fish are afterwards taken out of the boxes and stored in large rooms, through the center of which a freezing apparatus extends which is charged anew every day. By this means the fish can be kept for months until they come into demand.

The sturgeon range from Georgia, in winter, to Saint John, N. B., in summer, and are followed up in their season by men expert in their capture. Large gill-nets are used in this business, each about 200 fathoms long and with meshes a foot in size.

The Delaware River is the principal field of operation. Sturgeon enter this stream about the 22d of May, and in such immense numbers that nets about a quarter length have to be used, larger ones being at that time unmanageable. Mr. Blackson, an experienced fisherman, tells me that he has seen them so abundant that his net would sink with their weight as soon as it was thrown out. The average catch per net is from 25 to 30 fish apiece at each cast. This lasts about two weeks. The sturgeon move steadily up-stream towards the head of the