

essary to cut down the water, reducing the supply to each jar to about one quart each period of three minutes.

In doing work at Weldon, the difficulties attending the development of the eggs being removed, there remain two important points which should be carefully borne in mind, the one being the actual collection of the ripe fishes, and the other, the successful collecting and retaining of the fry. Of course, in using the word "collecting" a second time in the sentence above, it is readily understood that I have reference to the transfer of the embryo fishes from the jars to collectors in the form of aquaria. To collect the ripe fishes requires diligent labor on the part of the party in charge, which I could make very clear in a more lengthy communication.

If the United States Fish Commission should institute measures for conducting work at Weldon next year, I am confident, after mature reflection, that it would be wise to offer a premium to the fishermen for ripe fishes to the amount of \$2 each on delivery. I have good reasons for saying this. In ordinary seasons not more than fifty ripe fish could be expected, and these could be delivered only at expense to the fishermen, owing to the character of the Weldon fishing, where paddling through swift currents for miles is required on each drift.

As to collecting the embryo fishes the best effort will be required; for the available water at Weldon, even after the most successful filtration, will contain sediment which will quickly obstruct any screen of sufficient fineness to hold the fry. The fry are very small, and in muddy water are extremely difficult to retain. I must frankly confess that I do not know what method of retaining them is really best.

Ordinarily, indeed each year, April 15 and May 15 may be considered the correct opening and closing days of work there; and I consider the short time in which work may be done worthy of special consideration, if it is contemplated to establish an extensive hatchery there and in time for next spring's work.

RALEIGH, N. C., *August 30, 1884.*

10.—HOW TO DISTINGUISH THE SEX OF CARP.

By CHAS. W. SMILEY.

When the adult fish is nearing the spawning time the ripening of the ova produces a broadened appearance in the female, which is sufficient to enable most any one to distinguish the sex. It is necessary, however, to be able to distinguish them at a much earlier age, and this, although not generally understood, is declared by experienced fish-culturists to present but little difficulty. Dr. Hessel, superintendent of the United States Government ponds, scarcely ever fails to identify the sexes, although he declares his inability to describe in words the man-

ner in which he does it. The German carp-culturists, however, have distinctly stated their method.

Horák, in a work published 1869, and entitled *Die Teichwirthschaft mit besonderer Rücksicht auf das südliche Böhmen. Ein populäres Handbuch für Teichwirthe, Fischereibedienste und Freunde der Fischzucht*, by Wenzel Horák, says: "Fishermen who are not able to determine the sexes of the fish at once are in the habit of squeezing the genital parts until they yield either milt or roe. This method is very injurious to the production of young fish. An experienced pond-culturist will, at the first glance, distinguish a male from a female carp, even when they are only one year old. The milter, or male fish, has a depression or concave place in its genital parts, while the spawner, or female fish, has a protuberance or convex place."

Carl Nicklas, perhaps the most skilled carp-culturist at present living in Germany, indorses the above quotation from Horák, and adds: "The aperture of the genital orifice also seems to be somewhat larger and redder in the female than in the male. It is not very difficult to distinguish the male from the female carp; still, it may require a little practice." Prof. B. Benecke, of Königsberg, says: "As a general rule the belly of the spawner is broader and rounder; the genital aperture is larger and reddish and has thick lips, while in the male it forms a narrow slit."

Apparently without any knowledge of these German authorities, George M. Ramsey, M. D., of Clokey, Pa., writing under date of November 22, 1883, says: "I have discovered how to distinguish the sex of German carp at all seasons of the year. By inspection of the female carp a small fleshy protuberance, that pouts a very little, will be seen in front of the vent, whereas in the male carp the same is slightly depressed or sunken rather than protuberant. On examination each fish should be held up to the light in the same position, back downward." Evidently Dr. Ramsey has made an independent discovery of what was already known in Germany.

Among the most successful of the Americans who have received carp from the United States Fish Commission is Mr. Kemp Gaines, of Springfield, Clarke County, Ohio. He had young fish to sell as early as the summer of 1883, and, seeing the necessity of furnishing applicants with the proper number of males and females, he undertook to see if he could discover any method of distinguishing sexes. November 21, 1883, he reported his observations to the Fish Commission. On examining the carp taken for table use he found a difference in the form of the head and surmised that this might possibly indicate the sex. He put it to test during the summer whenever he dressed fish for use and failed to distinguish the sex but once.

It would be gratifying if those who have carp would put these methods severely to test and report to the Fish Commission their success or failure.

UNITED STATES FISH COMMISSION,

Washington, D. C., November 18, 1884.