

from the river to fish-pools or ponds which are about 20 feet square and are fed by tidal creeks from the river, flood-tide water being preferred.

After about six days the eggs have germinated into small fish. During this hatching process a covering of tree branches is put over the pond, about 4 feet above the water, to screen the pond from excessive light and heat and from the influences of capricious weather. When the fish are about 1 inch long they are sold to stock fish-ponds in various localities where fishermen are raising fish for markets.

Now comes the filthy process of feeding fish which prevails in Southern China. The fish ponds are located at every city and village on tidal rivers, streams, and creeks, and at the corner of each of these fish ponds is an accumulation of human excrement, which (after undergoing water-rinsing twice to extract urinal properties) is mixed with finely-cut young grass and fed to the fish. On this food and the tidal water they thrive and have no other nutriment.

The climatic conditions of a locality for fish-culture are worthy of consideration. The temperature of this portion of Southern China ranges during the year from 38° to 98° Fahrenheit in the shade, there being only a few days, perhaps a week, of these extremes. The temperature during the spring months of April and May ranges from 70° to 90°, the average being from 80° to 85°. Ice seldom forms. Once perhaps in half a dozen years frost makes a morning appearance, but quickly vanishes.

If further investigations of carp culture or fish-culture in Southern China are desired I can cause a thorough examination of this subject, but it is impossible to obtain more definite information without employing good men to go and visit the fish-hatchery district, and even then every statement has to be tested by facts from various sources.

It is possible that in the archives of the French legation, at Peking, there may be the results of a very thorough investigation into the industries of China by a corps of experts, who were attached to that legation when France was represented in China by a minister named Le Grene, about 1844. Among those experts who were employed in that work were gentlemen who were known to be very competent in their respective departments. Possibly fish-culture received due attention, as did silk and other branches of industry.

UNITED STATES CONSULATE,

*Canton, Quang-Tung, December 26, 1884.*

#### 67.—NOTES ON THE HABITS OF THE GOLDEN IDE (*IDUS AURATUS*).

By **RUD. HESSEL.**

The golden ide (*Idus auratus*) likes a cool, clear water. Notwithstanding, it can be kept in ponds where the water reaches a higher temperature—from 70° to 80°. In clear, cool water, such as spring water, they will obtain a more brilliant color than in muddy water,

The *Idus* has the habits of a river fish, likes deep better than shallow water. It seeks under plants and stones such food as larvæ, worms, and snails. It takes almost the same food the carp takes, including bread, cooked cornmeal, &c. Vegetable food it will not take.

The golden ide should not be kept in the same pond with carp. The carp make the water muddy and the ides destroy the ova of the carp. Carp should never be kept in an ide pond if it is desired that such ponds should be clear and that the ides should show to a good advantage.

The golden ide spawns in the neighborhood of Washington in April and the beginning of May, and in cool ponds (spring water) at the end of May. In the Southern States they spawn by the middle of March.

In regard to hatching in ponds, they would do better in large and deep ponds, with a good crowded vegetation, than in small or shallow ponds. The water in such smaller ponds, during cool nights, often attains a low temperature, which would prevent the ova from hatching out advantageously.

WASHINGTON, D. C., June 1, 1885.

#### 68.—FISH-CULTURE AT GOUVILLE, FRANCE.

By LEON D'HALLOY.

[From a letter to C. Raveret-Wattel.\*]

Eighteen months ago we placed in the lake at Gouville 1,400 trout a year and a half old. The year before we had placed there 6,000 about six months old. Of these last not one has been recovered, as they were probably too small to defend themselves in that body of water (about 11 acres). This year we have caught 1,016 three-year-old trout, resembling those we put in. These trout sold in the market for an average of 2 francs [38 cents] apiece. Our *fontinalis* have grown less rapidly than either the Scotch or the lake trout; we are now placing in the lake some two-year-old trout. The Rocky Mountain trout from California is a splendid variety. Following your advice, I have imported eggs for two years; and this year I have again had 20,000 which hatched well, although there was a considerable loss owing to the long voyage. We have now some good breeders; and during this year we have obtained 40,000 eggs, while next year (1884-'85) I hope to get 100,000. I think that now the question of industrial fish-culture is settled, or at least, is on the point of being settled. Our expenses are as follows: One man, 1,200 francs; food for the trout, 300 francs; total, 1,500 francs a year (and we have never spent more). The lake fishing would have returned 2,000 francs if we had not reserved some breeders, and the different

\* From Bulletin of French Acclimatization Society, July, 1884, p. 600.