

THE CONSTRUCTION OF CARP PONDS.

Following the interesting subject of carp culture, to which we alluded in our last issue, we devote considerable space in this number to a recital of some of the requisites in the construction of carp ponds and the details involved therein. In making this showing we shall draw chiefly from the writings of Rudolph Hessel, who was engaged by the United States Fish Commission to introduce the subject in this country. It would be impossible, of course, to give items of construction to meet all needs, for some may have one style of situation and others another. It will be our purpose more to present the main requisites, and these can be adapted to meet individual conditions. The culture of carp in California is spreading very rapidly.

LOCALITIES ADAPTED FOR CARP PONDS.

If intending to establish carp ponds, it will be necessary to ascertain the following points before the execution of the plan:

1. Is there a sufficient quantity of water at hand for all purposes, for the summer as well as winter? 2. Is the ground, soil and water favorable for culture? 3. It is important to examine the land minutely, in order to find what are the components of the soil, for not every kind of soil is suitable for carp culture. 4. It ought to be decided from the commencement how large the establishment is intended to be, whether only for private use and pleasure, or whether wholesale production of the fish as an article of trade is contemplated.

A rocky, gravelly ground is not appropriate for carp culture. Sandy ground, without a considerable mixture of loam, clay and humus, is of small use. Small ponds with a sandy bottom may be improved by supplying them with loam, as it is frequently done in agriculture.

The most favorable water will always be that which comes from rivers and brooks. Ponds might be constructed which would fill themselves with rain water during the winter or at any other time; but such water takes a moldy taste easily, which it will communicate to the fishes, as does the water from bogs also.

In Europe, experience has shown that water coming from fertile fields and meadows, carrying with it particles of offal from villages, is best adapted for carp culture. Spring water direct from the ground is not favorable, and ought to be conducted, for at least a few hundred yards, through wide, shallow ditches, in order to receive more nourishing components from the air as well as the earth, and above all, to be warmed to some extent by the sun and warm air.

CONSTRUCTION OF THE PONDS.

Ponds must not be too deep, as the water will be colder and will harbor fewer insects, larvæ, and worms, which form part of the carp's food; besides, this fish does not grow quickly in cold water. A depth of 3 feet in the center of the pond is sufficient; toward the outlet-sluice it may be from 6 to 8 feet deep, but only for an area of from 200—1,000 square feet. In the depths of this "collector," the fishes seek their resting place for the winter, and also in summer, when the water is too warm near the edge. The collector is marked C in the engravings. The outer part of the pond should not be deeper than 1 foot for the distance of about 70 or 100 feet, so that the water there may be warmed more thoroughly by the sun.

Toward the center of the pond, and in accordance with its size, a cavity of from 20 to 50 feet in length and 2 feet deeper than the rest of the ground should be dug. This will serve the fishes for a resting place in summer and winter. These cavities are called "kettles," and are marked E in the cut.

The inflow of water into the pond should never be allowed to be direct; as, for instance, a brook falling into it. This often causes the water to rise at an inopportune time, carrying

into the pond other fishes, especially the rapacious pike.

The inlet sluices from the stream must of course be of a strong and practical construction, so that an overflow is impossible, and they ought to be provided with gratings to prevent other fishes from intruding.

It is an indispensable condition for the culture in ponds, according to established rules, that they be so constructed as to allow of being thoroughly drained, so that the fishes may be taken out without any difficulty.

If the size of the principal and supplementary ponds has been decided on, the height, depth and width must be measured, and the levels of the

become a very tenacious mass, which will not allow any water to penetrate. The completion of this laborious task will be a source of ultimate satisfaction, as many disadvantages, which might arise after the filling of the pond, will be done away with through its agency. The dam should not be made entirely of clay, for in mid-summer, during the great heat, it would dry out too much on that side most exposed to the sun, and consequently it would become full of fissures, through which the water would escape, and this might become disastrous for the establishment.

PONDS REQUIRED.

To carry on carp culture in a regular and

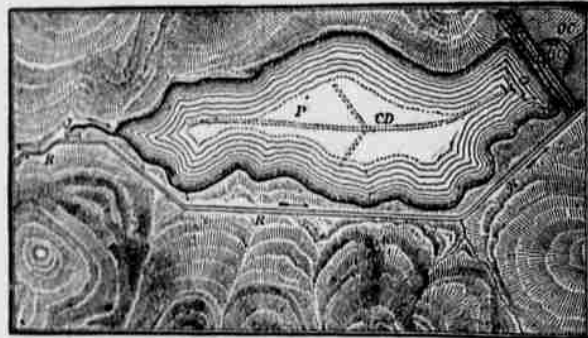


FIG. 1. PLAN OF A NATURAL CARP-POND.

ground and dams, if such are needed, should be carefully taken. The leveling of the bottom is required to assist in the determination of the depth of the ditches, "kettles," collector and outlet to be dug in it.

BUILDING THE DAM.

In the erection of the required dam it is most important that it be constructed of the very best material, so as to make it secure against the destructive influence of the water. It ought to be three times as wide at its base as it is high, and at the top the width should be the same as the height. The interior or water side should be less inclined than the exterior one.

judicious manner, several ponds are required, according to the various purposes they are destined for.

1. The hatching pond.
2. The breeding pond.
3. The culture or regular carp pond.

The hatching pond serves most particularly for natural impregnation and hatching, or rather for natural propagation generally, by placing a number of male and female fishes in the pond. Here the females drop the eggs, during the spawning season, upon aquatic plants, where they are impregnated by the male.

The hatching-pond should not be as large as

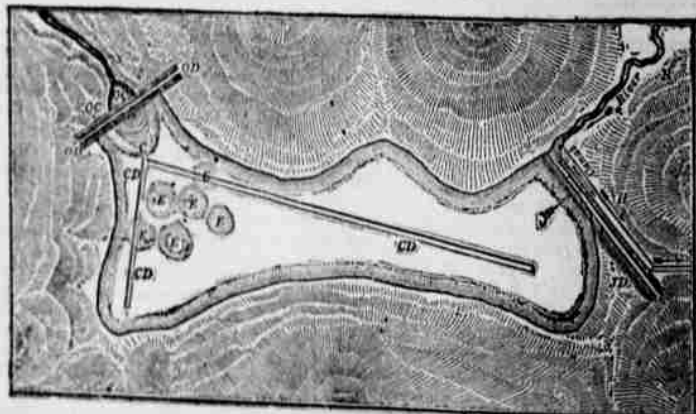


FIG. 2. PLAN OF ARTIFICIAL CARP-POND.

Before the foundation of the dam is laid, the ground where it is to stand must be dug out to a depth of two and a width of from four to five feet throughout the whole length of it. If the ground does not consist of loam it must be filled up with it about one foot deep, and this must be tamped down hard. A second layer follows and is disposed of in the same manner. This is repeated, the clay being moistened every time if required, and then beaten down solidly. This lower stratum is but the foundation of the dam, which is formed from the earth dug out of the pond or its vicinity. This is continued until the dam is completed. Care must be taken, however, that the construction and tamping down of this lower stratum be done in layers and that nothing but good clay be used. In this manner the material of the foundation will

the breeding-pond; its depth not to exceed 1 or 1½ feet. The outer portion, or, as it is termed, the low-water margin, should generally be from 2 to 5 inches in depth, and from 30 to 40 feet in width.

These ponds must be secured against the intrusion of pike, eels, bass, catfish, tritons, water snakes, turtles and water lizards, rats and water fowls, or any voracious animals. A fine grating will prevent the entrance of the former; against the latter, various traps are in use, and other means might be devised. It is of the highest importance that new ponds be assiduously kept clear of the animals mentioned, and of many others not named here.

PREPARING NATURAL PONDS FOR CARP.

If it be desired to make use of natural ponds, it is necessary to ascertain whether they can be