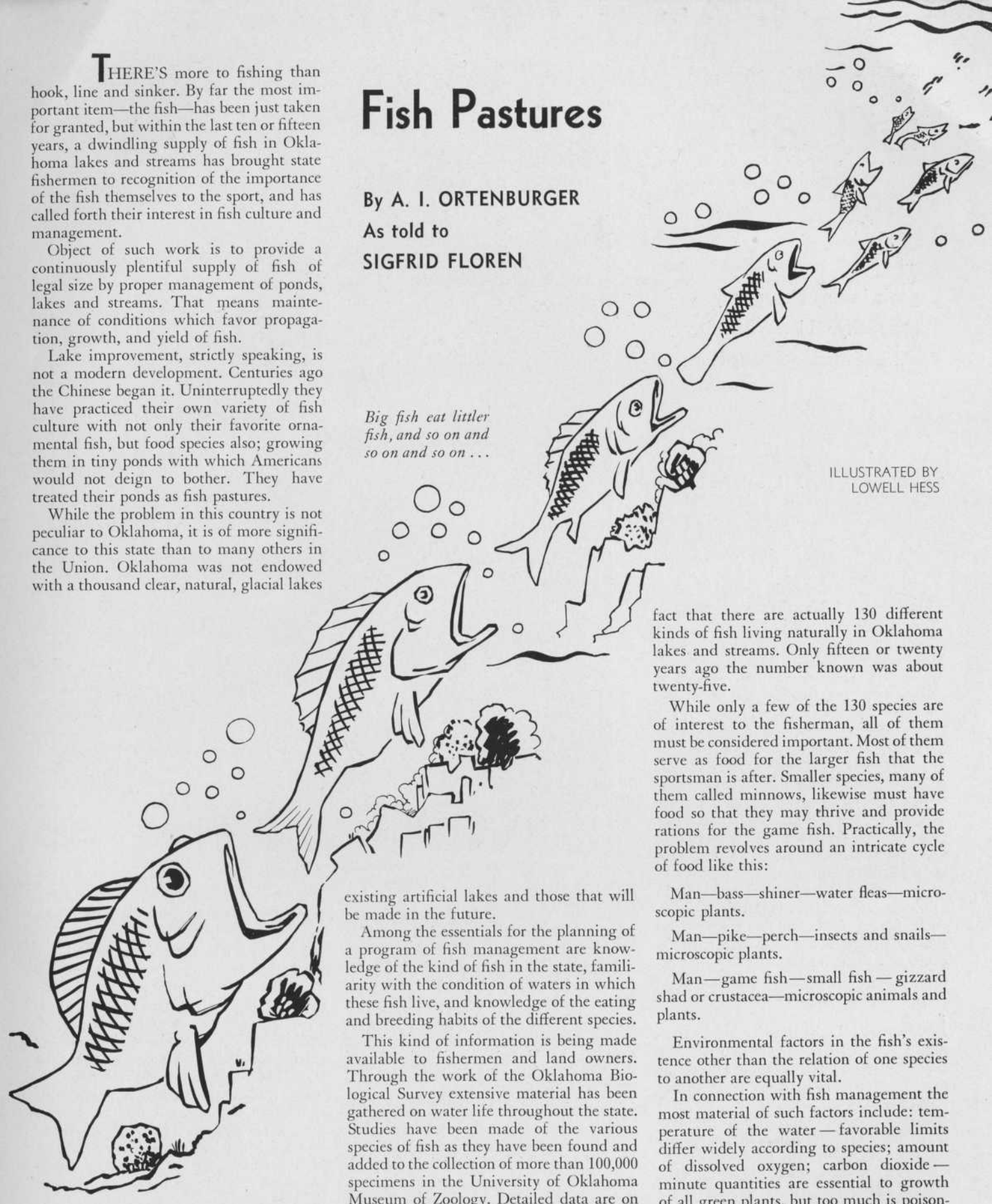
Fish Pastures

By A. I. ORTENBURGER
As told to
SIGFRID FLOREN



Big fish eat littler fish, and so on and so on and so on . . .

ILLUSTRATED BY LOWELL HESS

THERE'S more to fishing than hook, line and sinker. By far the most important item—the fish—has been just taken for granted, but within the last ten or fifteen years, a dwindling supply of fish in Oklahoma lakes and streams has brought state fishermen to recognition of the importance of the fish themselves to the sport, and has called forth their interest in fish culture and management.

Object of such work is to provide a continuously plentiful supply of fish of legal size by proper management of ponds, lakes and streams. That means maintenance of conditions which favor propagation, growth, and yield of fish.

Lake improvement, strictly speaking, is not a modern development. Centuries ago the Chinese began it. Uninterruptedly they have practiced their own variety of fish culture with not only their favorite ornamental fish, but food species also; growing them in tiny ponds with which Americans would not deign to bother. They have treated their ponds as fish pastures.

While the problem in this country is not peculiar to Oklahoma, it is of more significance to this state than to many others in the Union. Oklahoma was not endowed with a thousand clear, natural, glacial lakes like such states as Minnesota, Wisconsin or Michigan. And, unlike Colorado, Oklahoma has no abundance of pure, rushing mountain streams. This state does have fish-inhabited waters and much can be done to improve what is left of the streams, while much more can be done with the existing artificial lakes and those that will be made in the future.

Among the essentials for the planning of a program of fish management are knowledge of the kind of fish in the state, familiarity with the condition of waters in which these fish live, and knowledge of the eating and breeding habits of the different species.

This kind of information is being made available to fishermen and land owners. Through the work of the Oklahoma Biological Survey extensive material has been gathered on water life throughout the state. Studies have been made of the various species of fish as they have been found and added to the collection of more than 100,000 specimens in the University of Oklahoma Museum of Zoology. Detailed data are on record about each fish's identity, its natural habitat, its habits, and even about its parasites. O.U. biologists are directing their efforts toward laying a factual scientific foundation for development of a fish management program.

Surprising to all but the experts is the fact that there are actually 130 different kinds of fish living naturally in Oklahoma lakes and streams. Only fifteen or twenty years ago the number known was about twenty-five.

While only a few of the 130 species are of interest to the fisherman, all of them must be considered important. Most of them serve as food for the larger fish that the sportsman is after. Smaller species, many of them called minnows, likewise must have food so that they may thrive and provide rations for the game fish. Practically, the problem revolves around an intricate cycle of food like this:

Man—bass—shiner—water fleas—microscopic plants.

Man—pike—perch—insects and snails—microscopic plants.

Man—game fish—small fish — gizzard shad or crustacea—microscopic animals and plants.

Environmental factors in the fish's existence other than the relation of one species to another are equally vital.

In connection with fish management the most material of such factors include: temperature of the water — favorable limits differ widely according to species; amount of dissolved oxygen; carbon dioxide — minute quantities are essential to growth of all green plants, but too much is poisonous; hardness of the water—hard water lakes generally are more productive because they are more favorable to growth of fish food; amount of silt; acidity or alkalinity; depth of water; shelter about the lake—the younger the fish, the greater the need;

(PLEASE TURN TO PAGE 34)

Fish Pastures

(CONTINUED FROM PAGE 13)

amount and kinds of vegetation, both submerged and otherwise.

Too often the importance of these factors is overlooked, especially when stocking a new lake. The dumping of young fish into a newly-made pond can be but slightly different from staking a calf in the middle of a concrete floor. The calf is in its element, air, just as much as the fish is in its element, water. But both must have something to eat.

Moreover, aquatic animals meet more diverse conditions than do air-breathing animals. While the air in Oklahoma is chemically the same as that in any other spot in the world, the same thing is not true of water. Two lakes, either close together or separated by a continent, are different, and many species of fish are sensitive to those differences. Consequently before stocking a body of water, a person should know something about both the environment from which the fish were taken and more especially about that into which they are to be thrust.

MORE obvious to the fisherman is the necessity for being acquainted with the habits of the fish with which he intends to stock a new lake or replenish an old one. Most important are their eating and breeding habits. Fish management at once raises the questions of where the particular species stands in the food cycle, what it eats and by what it is eaten, how much it requires, and what other habitat elements it demands.

On the matter of breeding, which the fisherman is too prone to consider as the only problem, such matters as these require consideration: Do the fish in question lay eggs or give birth to their young alive? What kind of nests do they build, gravel, sticks, or what-have-you? And are those materials available?

The inescapable conclusion, then, is that any apparently simple fish or lake problem is necessarily complicated. Often, however, not all angles to the problem arise in the improvement of a single pond or stream—which is fortunate. Often, too, a large amount of fishing satisfaction can be assured by only a single improvement.

Effective fish management, as determined by scientific studies of both fish and waters, involves such specific matters as the following: proper amount of cover, with certain parts of the lake left choked to serve as refuge for nursery beds; regulation of amount of water vegetation; attention to size of spawning area; reliance on artificial stocking; fostering desirable species of fish; control of fluctuation in water level; regulation of basic fertility, nitrates and phosphates; regulation of the lake's supply of forage fishes and other organisms; governing amount of silt accumulation; protection against harmful pollution; prevention of deficiency in oxygen which leads to fish mortality; maintenance of proper temperature for the particular species; erection of barriers between lake and trout stream to prevent migration of fish of each into water unsuited to them; and forbidding the overfishing of any body of water.

In a more general view of the problem of converting our lakes into fish pastures, this fact stands out above all: Oklahoma lakes have been made by men; they are not natural. Hence they are all relatively young and biologically or geologically immature. Men cannot expect to create ideal fishing grounds in a year or two when it takes Nature centuries. Fish management calls for careful and continuous planning.

Such planning must include consideration of related problems. Arising contemporaneously with the building of a dam to produce a lake is the problem of the drainage area that the new lake includes. The water may come from rains which fall in the immediate vicinity or it may flow from miles away.

Most of the rain should be stopped, if at all possible, where it falls—before it begins to run down into gullies, seeps into the ground or evaporates. This is the only real method of controlling erosion and of keeping the lake from being filled with silt in a comparatively short time, which is the largest single problem connected with many of the newer and smaller lakes in the state.

Erosion is being controlled to some extent by the building of a large number of small dams. This is the engineering method, which is a good and necessary stop-gap, but, in the long run, should be considered only a temporary and not the essential method of control.

If possible, methods of land management rather than water management should be used. Such methods include terracing, contour plowing and strip-cropping. Planting the land's natural vegetation, including trees, in an attempt to bring back the original ground covering, is the most important method for uncultivated, eroded areas. This all takes time.

The drainage area of a successful lake should not be pastured. It should be further protected by adequate fencing.

Putting the methods outlined above into effect will yield benefits not only in soil conservation and in fish management, but may also result in the phenomenon of formerly active springs beginning to flow again. Recently Bromide Springs at Platt National Park near Sulphur dried up for the first time in its recorded history. Explanation comes partly from the wasting of the water and partly from the excessive grazing in the region of the Arbuckles where Simpson grass outcrops, since rainfall in the area is the source of supply for the spring. Neither killing nor reviving a spring can be accomplished in a few months or a year. It is known, for example, that Jimmie Spring in the Wichita Mountains is fed by water which fell as rain four years ago.

Evaporation is a serious problem in Oklahoma because of relatively high temperature, wind velocity, and low humidity. In a large lake this may mean that the water will fall along the bottom gradient as much as thirty feet during a summer unless there is an ample in-flow. Its seriousness is accentuated by the fact that necessary water plants near the shore are left dry and die as evaporation lowers the water level. It may also work havoc by exposing already prepared fish nests.

Evaporation may be cut down somewhat by planting of the proper trees around the lake. That is virtually the only corrective. The evil can be minimized, however, through effective land management of the drainage area.

Enhancement of the beauty of a lake area is always an element to be considered in any program of land and water management. But it is a mistake to clean up or beautify a lake shore or a drainage basin to a great extent. There can be an agreeable compromise between beauty-lovers and fishermen. Certainly it is overdoing the thing to burn out the grass and underbrush around a large lake because it is "hard on silk hose." Burning of natural vegetation, dead grass and leaves is to be condemned in any area in need of a program of soil conservation or fish management.

BOTH theory and practicality in fish management, as in the management of any wild life or of domesticated crops, involve the deliberate and skillful control of not only the crop species being cultivated or favored, but also of the other species of plants and animals which have or might have an important effect on the desired yields.

Methods of the agriculturist and the forester should, in general, prove applicable in wild life management and investigation. Difference between the culture of domesticated and wild crops seems to be largely one of degree rather than kind. Objectives are identical: frequent, generous and dependable yields of the desired species year after year from the same units of land or water . . . obtainable at reasonable costs . . . and readily available for human use or enjoyment.

Time, patience, and scientific study can develop fish pastures that will make Oklahoma lakes highly productive for the fisherman.