

ANIMAL PSYCHOLOGY

Test Frustrates Salmon

► FISH, LIKE HUMANS, become "frustrated" when placed under conditions of stress and strain.

This was observed when biologists of the U. S. Fish and Wildlife Service, Seattle, Wash., conducted basic research on sockeye salmon at the fish behavior laboratory of the Pacific Salmon Investigations.

Scientists also observed a "King-of-the-Mountain" routine among the salmon in which one became dominant and conquered the others for the choice shelter in a pool.

These sidelights on the salmon's psychology came about when the biologists set up a six-foot, three-chambered tank, with connecting chambers at top, with fresh water, brackish water, and salt water. Three fish were introduced into the fresh water to see if sockeye salmon smolts were ready for their journey to salt water.

The fish paid no attention to the difference in salinity of the waters, but soon took up residence, one fish to a pool. When two other fish were introduced, the established fish fought violently to guard their homes even to the extent of pulling out scales on the newcomers when they came into their two-foot chambers. The fourth and fifth fish had no place to go and exhibited signs of frustration—flicking of fins, quivering and shaking.

But when the five fish, who had been fighting furiously a few minutes previously, were placed together in a large unpartitioned pool, they quickly schooled and acted "like long lost friends."

Sockeyes normally exhibit the highest schooling behavior of any salmon.

When a block of wood about one foot square was placed on the water it provided

a shaded area in the center of the pool. All the fish took for this shelter. Shortly, however, one strong salmon was "king" and drove all the other fish away much in the manner one hen establishes herself in a barnyard flock through the phenomenon of peck order.

The fish driven from the shade took to the unsheltered corners of the pool and shook all over, the biologists reported. They appeared to be highly excited and agitated. They were paler in color than a normal fish. These characteristics continued as long as there was this condition of stress or replacement.

The fish behavior laboratory, housed in a wooden structure adjoining the main building of the Pacific Salmon Investigations on Montlake Boulevard in Seattle, has conducted a series of studies over six months. The purpose of the research is to gain a basic understanding of fish behavior. This information will be useful in field studies which in turn are applied to the conservation and wise management of the salmon resource.

"Actually we know little of fish behavior," says H. William Newman, in charge of the behavior laboratory. "By learning the behavior characteristics of salmon fingerlings under specified laboratory conditions we hope to predict the reactions of migrants to the many different conditions met in traveling from the fresh-water stream to the ocean."

The behavior tests were conducted by Mr. Newman and Alan B. Groves of the fish behavior laboratory under the direction of Dr. Gerald B. Collins who supervises the studies.

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ples indicate that Complex A was constructed and used during the four centuries 800 to 400 B.C.

The new dates are reported in *Science* (July 12) by Drs. Philip Drucker, Robert F. Heizer and Robert J. Squier of the Smithsonian Institution in Washington, and the University of California at Berkeley, Calif.

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ETYMOLOGY

Ancient Peoples Had No Name for "Weeds"

► A GARDENER in ancient Egypt was lucky—the word "weed" did not even exist in his language.

He may have pulled up a senmit plant or burned castor plants for fuel but the Egyptian never had a collective word for such plants.

Actually most of the plants we now think of as weeds were then believed to be useful, whether for eating, looking at—or poisoning. Each plant had its own individual name. About the nearest the ancient Egyptians, Greeks and Romans came to our word "weeds" were expressions meaning "non-useful herbs." Contemporary French and Italian words still keep this old meaning when they call weeds "plantes nuisibles" or "malerba."

Often the name of one outstandingly useless plant became synonymous for weed. The Greek "tares," a poisonous grass, is an example of this. Experts say now, however, that where the word appears in the Bible and has been translated to mean "weeds" we should keep the Greek word or, maybe, substitute "darnel," the name of a poisonous grass of cereal crops with which tares has been identified.

The early Roman solved the problem of having no word for the weed concept by using variations of *Runcina*, the name for the goddess of weeding. "Erunco herbas" described the pulling up and discarding of weeds from the Roman garden.

Our English word has a history that goes back more than 1,000 years to the Anglo-Saxon "weod." Some etymologists point out that "weod" and its derivatives may be derived from Dutch and Belgian words for woad or dye-weed.

It is believed that the earliest English work on agriculture to include our term was the use of "wede" by John Fitzherbert in his *Boke of Husbandrye* which appeared in 1523. Strange as it may seem, a book entitled *Horse Hoeing Husbandry*, published in 1731, employs the modern form of "weed."

Dr. L. J. King of the Boyce Thompson Institute for Plant Research, Yonkers, N. Y., reports in *Nature* (June 29) that although weeds were "perhaps recognized individually in the ancient Near-Eastern civilizations, there is little evidence that a word or words existed for the collective term 'weed'."

We, thanks to the Germanic languages, do have a name for those ubiquitous, non-useful plants called weeds.

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ARCHAEOLOGY

Olmec Culture Dated

► RADIOCARBON DATES of wood charcoal from La Venta, major ceremonial center of the classic phase of the Olmec culture, in the state of Tabasco, Mexico, indicate the La Venta site may be more than 1,500 years older than archaeologists have supposed.

La Venta is approximately 373 air-line miles southeast of Mexico City and about 12 miles inland from the Gulf of Mexico. With its highly developed stone monumental art and elaborate jade figurines and ornaments, it has usually been regarded, especially by archaeologists in the United States, as corresponding in time to the earlier part of the classic period of Lowland Maya cultural development. This period is usually considered to be from 300 A.D. to 900 A.D.

Now the new radiocarbon dates show that the La Venta center is much older than that. Instead of having been constructed and used about 1,000 years ago,

the date is now given as from 800 B.C. to 400 B.C. or from 2,700 to 2,300 years ago.

The 1955 excavations at the La Venta site were carried out north of the great pyramid, principally in the column-enclosed ceremonial court, known to archaeologists as "Complex A". This underwent three major successive alterations following its original construction.

No carbon samples for dating were obtained from the last two construction phases. Five samples were collected, however, from the time of the original construction. One of these dates back to 1,154 B.C. with a possible error of 300 years.

One sample came from the second construction phase and was dated at 804 B.C.

Other samples came from the lower part of a four-foot-thick layer of wind-blown sand and represent a time after the final alterations were completed.

Taken all together, and using conservative figures, the radiocarbon dating of the sam-