

BIOPHYSICS

Odor Detection Theory

Understand method of detecting smells by comparing process to computers' workings. Theory agrees with experimental evidence trained persons can tell 30 intensity levels.

► HOW A person detects odors can be understood by comparison to the way computers work, Dr. Raymond M. Hainer, Dr. Alfred G. Emslie and Miss Ada Jacobson told a conference sponsored by the New York Academy of Sciences and the American Society of Heating and Ventilating Engineers in New York.

The sense of smell was investigated using the theory of cybernetics. The nervous control system for sensing odors and transmitting such information to the brain was compared with the mechanical electrical systems, such as computing machines.

After studying tests showing how well people can smell, the physicists imagined a nerve network that would get this information to the brain. Then they found devices and connections in the body that seem to handle the odor information in much the same way as a computer handles its instructions.

People can learn to recognize at least 10,000 distinct odors and can detect fantastically tenuous odors, but are quite poor at distinguishing a strong odor from a slightly weaker one of the same kind.

Each nostril, they reported, has a lobe about as big as the end of the thumb. This lobe is made up of some 1,900 "telephone exchanges," called glomeruli, and each of these sends 24 neurons to the brain. These neuron bundles are compared by the physicist to a board with 24 lights. By turning on some of the lights, a recognizable picture can be formed.

Similarly, when an odor is detected, their theory suggests that particular ones of these 24 neurons "light up" to form a code for chloroform, for instance, and nothing else. With only 24 neurons, it is possible to get some 16,000,000 patterns, corresponding to as many different odors.

Although the kind of odor depends on the pattern, the strength of the odor depends on how many of the 1,900 bundles of 24 neurons react to the chloroform, and that is dependent on how much chloroform is in the air.

By their theory, the physicists have shown that there should be about 30 levels of intensity, which agrees with experimental evidence for trained people.

Science News Letter, May 2, 1953

MARINE BIOLOGY

Tuna Breeding Stock

► A CATCH of 92 tuna averaging about five times the size of ordinary commercially caught tuna off the Pacific Coast, demonstrates the presence of deep-swimming breeding stock in the eastern Pacific. The catch has been reported by Dr. Milner B. Schaefer, director of the Inter-American Tropical Tuna Commission.

The big fish were brought to San Diego on the research ship N. B. Scofield, back from a two-month expedition to tropical waters to find whether these large yellow fin and big eye tuna inhabited that region. The expedition was the joint effort of the commission, the Scripps Institution of Oceanography and the California Division of Fish and Game.

Dr. Bell Shimada, fisheries scientist on the expedition for the commission, reported the catch averaged 200 pounds per fish. Big eye tuna ranged up to 350 pounds and yellow fin up to 250 pounds.

The fish were caught by the "long line" method used by Japanese and Hawaiian fishermen. In this method lines are left supported by buoys which trail dead bait 100 feet beneath the surface of the ocean. Although this system of fishing is standard

among oriental fishermen, it has never been used on this side of the Pacific because of its high cost in labor. California tuna fishermen pole-fish on the ocean surface.

Most of the tuna were caught on a southerly course which terminated about 250 miles southwest of the Galapagos Islands, productive fishing area for West Coast commercial fishermen. Dr. Shimada pointed out that few of the big fish were caught over the fishing banks or closer to either the Central American or South American shore lines.

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INVENTION

Patent Given to Circular-Winged Plane

► AN AIRPLANE with round wings resembling flapjacks has been invented by Stanley Rzepela of Philadelphia, Pa. The plane is powered by two propellers situated vertically inside the hollow wings. Both propellers are belt-driven through a system of pulleys from a single engine.

The airplane is designed to combine the

properties of a helicopter and a jet plane. Air is sucked into the wings through a large hole in the top of each wing. It is discharged toward the ground through a similar hole in the bottom of each wing. When the propellers are going fast enough, the airplane is supposed to rise straight up.

Then the bottom holes in the wings are closed. This causes the air to be channeled through a tube in the fuselage and to be discharged in jet-fashion near the tail.

Mr. Rzepela states that this jet action propels the plane forward in flight. He received patent No. 2,635,833.

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