

ZOOLOGY

Porpoise Has "Sonar"

► DROP a half-teaspoonful of water from a height of five or six feet into a pool of water and if there is a porpoise swimming around he probably will hear it.

The porpoise is supersensitive to sound, Dr. W. N. Kellogg reports in *Science* (Oct. 24).

It is known to react to sound of 80 kilocycles per second, two full octaves above the upper frequency threshold for hearing in man. The animal actually might be said to possess an echo-ranging or a sonar system, Dr. Kellogg, professor of experimental psychology at Florida State University, explains.

Now, for the first time, he reports, the ability of the porpoise to detect objects by means of reflected sound has been demonstrated.

That porpoises make sounds has been known for many years. Experiments show they make occasional exploratory bursts of sound pulses. These "auditory glances" enable the porpoise to detect and even distinguish between objects in the water. Streamlined objects silently inserted into the water were also detected, as were invisible objects such as sheets of Plexiglas and glass.

A splash may alert a porpoise that some-

thing is entering the water. The animal immediately lets loose with a "torrent of sputtering sound pulses."

Without the splash, Dr. Kellogg reports, there is a delay of only ten to 15 seconds before the object is "seen" as a result of the random auditory glances.

Sight, smell, temperature or touch were ruled out by the scientist and his colleagues as possible aids to detecting food, etc.

In a series of experiments they established that the porpoise uses its sonar system to avoid colliding with underwater objects and that its performance improves after several trials until there are no collisions.

Apparently learning takes place, Dr. Kellogg reports.

The porpoise distinguished between two fish, the preferred food fish being about one-half the size of the nonpreferred fish. Also, in 202 trials, the porpoise made no attempt to get at a fish behind a glass barrier. During the experiment in which there were two fish offered, both visible but one behind the glass, the porpoise "sputtered intermittently," listening for the right fish to get.

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ASTRONAUTICS

Predict Space Man Soon

► A MAN could be orbiting the earth in a space capsule by 1960 if the Government would back the program with an estimated hundred million dollars.

Dr. Arthur Kantrowitz, director of the AVCO Research Laboratory, Everett, Mass., said the ideal candidate for the first space pilot would be a "little physician." It would be easier to teach him the necessary engineering and physics than to teach an engineer the required medical knowledge.

Dr. Kantrowitz's plan calls for sending about half a dozen 1,000-pound capsules containing animals, probably monkeys, in earth-circling orbits before man makes the attempt. The vehicles would be completely controlled from earth, so that the animals and the first man in space could be brought back alive, even if he were unconscious due to weightlessness or other unforeseen conditions.

The space capsules would be designed to circle several days in the so-called "orbit of decision," at altitudes from 100 to 120 miles above the earth's surface.

Launching a man into space can be accomplished with presently available booster rockets, Dr. Kantrowitz said. Many of the engineering problems involved in putting up a manned satellite, including more precise guidance systems, have already been solved in connection with the ICBM program.

Dr. Kantrowitz urged starting the program immediately, pointing out that a manned space laboratory would lead to more rapid progress in exploring beyond

the earth's atmosphere than unmanned, automated space vehicles.

The first step would be the 1,000-pound capsules for animals, followed by a 1,400-pound satellite for a man, preferably a physician weighing about 150 pounds. The orbiting space laboratory would closely follow these developments.

One advantage of the relatively low-altitude orbit chosen by Dr. Kantrowitz is that even the rarefied atmosphere at the 100-to-120-mile level can be used for orienting the satellite and to help start its recovery. It is also possible to take off from this level for more extended space flights by applying small amounts of thrust.

The term "orbit of decision" is thus applied because it will be possible from there to return to earth, to remain in orbit or to set off into space.

Dr. Kantrowitz outlined his manned space program at the University of Maryland's Space Research and Technology Institute.

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PSYCHOLOGY

Small Doses of Alcohol Affect Driving Skills

► IF YOU are an extrovert, chances are you had better not have an alcoholic drink if you are going to drive, not even a small one.

The extroverts among a group of 40 volunteers had an average increase of 23% in errors in driving performance made under

the influence of alcohol. Introverts had an increase of only six percent. All volunteers' performances were evaluated on a driving training apparatus before and after drinking various amounts of absolute alcohol.

Experiments designed to test the effect of small doses of alcohol on a "skill resembling driving" show that several factors, including personality, have to be considered. However, on the whole, driving ability begins to deteriorate with very low blood alcohol concentrations, a group of researchers reports in the *British Medical Journal* (Oct. 25).

Although the National Safety Council of America recommends concentrations of 100 milligrams (mg) per 100 milliliters (ml) of blood as the "safe" limit, the scientists found performance begins to deteriorate with as little as 20 to 30 mg per 100 ml of blood. In fact, there is no threshold effect. As soon as there is a measurable amount of alcohol in the blood there is also a measurable increase in error.

In carrying out the experiment, the scientists also found that of three breath analysis instruments tests, the "alcometer," the "drunkometer" and the "breathalyzer," the last proved to be the most reliable. Also, they reported no change in average speed as a result of drinking itself; there were individual variations, however.

Age, sex, previous driving experience and previous drinking habits appeared to be unrelated to individual responses to alcohol.

G. C. Drew, Dr. W. P. Colquhoun and Hazel A. Long, department of psychology, University of Bristol, carried out the experiment on behalf of a joint committee appointed by the Medical Research Council and the Road Research Board.

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ZOOLOGY

Mice, Shrews Select Food By Instinct and Learning

► SOME SMALL mammals can not only tell if the insect food they dig up is edible or not, they can also detect if it is male or female, sick or healthy.

There is evidence that both instinct and learned behavior play a role in the way shrews and deer mice select their food, C. S. Holling of the Forest Insect Laboratory, Sault Ste. Marie, Ontario, has found. Apparently, the mammals locate food, sawfly cocoons in this experiment, by sense of smell.

Afterwards, in the eating phase, taste stimuli take over. There seem to be innate likes and dislikes as far as taste goes, the scientist reports in the *Canadian Journal of Zoology* (Oct.), but none associated with the odor stimuli. The animals had to learn by experience what odors were associated with particular cocoon contents.

Larger animals also selected more female cocoons, which are larger than the male. Although fungus-infected cocoons were dug up and some were opened, the animals never ate a diseased insect.

This research may support theories that small mammals are important predators of insects that spend part of their life in the ground.

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