

PSYCHOLOGY

Electric Signals To Brain Aid Understanding of Mind

Mongrel Dog With Coil Connected to Brain Becomes Living Robot When Current Is Induced; Feels no Pain

XENIA, just a plain American mixed breed dog, is teaching the psychologists new secrets of the working of mind and body.

A happy, healthy animal, she is unusual because for the sake of science there has been arranged an induced current connection between an electrical transmitting coil and an electric coil buried beneath the skin of her head and attached directly to her brain.

With great friendliness toward her sponsor, Dr. Roger B. Loucks of Johns Hopkins' Phipps Psychiatric Clinic, Baltimore, the dog Xenia acted as subject in experiments before the meeting of the American Psychological Association, where she was one of the distinguished guests.

From the experiments with Xenia (pronounce her Russian name as though it were spelled Zenia) psychologists and psychiatrists hope to learn more of the special functions of various areas of the brain. They hope to discover just how learning takes place and how the behavior of man and other animals can be modified.

Xenia's Russian name is appropriate because the experiment in which she is assisting so vitally is a continuation of research associated with the name of the great Russian, Pavlov. Dr. Loucks followed the Russian tradition of naming his subjects alphabetically. Xenia is the twenty-fourth.

The coil buried in Xenia's head can pick up electromagnetic energy from another coil outside her head in somewhat the way that a radio receiver picks up the energy of a broadcasting station, Dr. Loucks said. Thus the experimenter can reach the brain of the animal directly without any pain or annoyance to the animal. The brain, having no sense organs, does not feel the electric current at all, so that the dog during experiments does not even flicker an eye.

Xenia is friendly and as much interested in going through the experiments as is her scientist friend and master.

When she goes into the room where the apparatus is set up she strains at her leash to get to her proper place, wagging her tail, pricking up her ears and watching the experimenter with sparkling eyes. When the experimenter pushes a button, thus sending the signal to the proper motor area of Xenia's brain, her movement of her paw results so inevitably and mechanically that the dog may be considered a living robot in this respect.

Dr. Loucks has studied ten dogs by this same method, making the connections to various parts of the brain.

When the signals go to the motor area of the brain as they do in Xenia,

the animal can not be taught to respond to a buzzer alone, which previously was sounded coincidentally with the application of the current, even after nearly a thousand trials. The animal fails to make the connection between the sound of the buzzer heard through the ears and the current going directly to the brain.

When the current goes directly to the sensory area of the brain as it does in other of Dr. Loucks' dogs, however, such a relationship between buzzer and current is readily made. The dog will get so that he lifts his paw at the sound of the buzzer without any current just as you might find your mouth watering as you catch the odor of frying bacon or the sound of a dinner bell, even though you have no food in your mouth.

Applications of this method may aid in the diagnosis of ailments of the brain from the special behavior of the patients. Such indirect methods are necessary because of the difficulty of discovering by X-ray or other such means the exact location of injuries to the human brain.

Thus Xenia and her companions, al-



XENIA

Despite her distinguished Russian name, she is just an ordinary healthy, happy American dog of unknown ancestry who is aiding scientists to gain new information about the mind. The small coil shown lying on Xenia's head induces a current in another coil buried beneath the skin. It carries a signal direct to the animal's brain in much the same manner that a radio receiver inside a building picks up the energy of a broadcasting station. The signal goes directly to the motor area of Xenia's brain. In response, she raises her right hind paw so inevitably and automatically that she is a living robot in this respect. Yet Xenia does not so much as flicker an eyelash. The brain, having no sense organs, does not feel the current at all.

though enduring no sacrifice themselves, are contributing notably to the aid of science and to the sufferers from brain injuries.

Learning can take place, to a limited extent at least, when the brain cortex is completely missing. Cases of dogs who had lost their brain cortex through injury to the brain and yet could be "conditioned" or taught to modify their behavior, were reported to the same meeting by Dr. Elmer Culler, of the University of Illinois.

When a bell is rung or a light is flashed at the same time that a healthy animal is given an electric shock, he will soon learn to pull back his paw as soon as the bell or light signal is given and thus avoid the shock. The animal who has lost the brain cortex can not learn to avoid the shock, but he does learn to show general symptoms of annoyance at the signal alone. This shows that he does make a connection between the signal and the shock.

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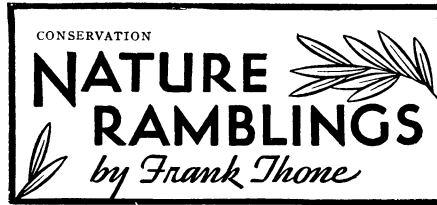
Pleasantness of Words Depends On Meaning

YOUR EAR is pleased by such musical words as coral, serene, and swan, and offended by others such as waddle, and squawk, because of your past associations with these words and not because of their sounds. This finding, at variance with the opinion commonly held by poets and orators, was reported to the American Psychological Association by Dr. Edward L. Thorndike, of Teachers College, Columbia University.

Persons who rate words for the unpleasantness or pleasantness of sound alone, regardless of meaning, are nevertheless influenced by the meaning the words have for them, Dr. Thorndike declared. Nonsense words, made up to test the pleasantness of certain sounds, are likely to be rated according to their resemblance to meaningful words.

The commonly assumed superiority of vowels and liquids, and the inferiority of gutturals and aspirates have probably been overestimated, Dr. Thorndike said. Thus, in the artificial words, "malo" showed no great superiority, from the subject's judgments, over "masho," "macho," and "mago." The sound of a as in father appeared to be little more pleasant than a as in fat.

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Unreturning Wilderness

EVEN the undisturbed bits of wilderness we have left are not really the same as they were before the white man came.

Many places in the East still have their fragments of virgin timber, that have never known ax or fire. Many in the West can similarly boast of patches of virgin prairie, that have never been plowed or grazed over by domestic cattle. Such a relic of the aboriginal wilderness is usually (and quite justifiably) the pride and boast of the community that has preserved it.

Yet they are never quite the same as they were in pre-civilized days, any more than a piece of cloth from your great-grandmother's wedding gown is the original gown itself. They may harbor the same trees, the same wildflowers, that have been part of their makeup since earliest times, but these are only a part of the pattern, just as the

embroidery on your woven heirloom is only a part of its pattern. They have lost the continuity with other areas of their own kind, and are now at best just patches of an old and beautiful fabric set, without matching, into the land's new garment of cultivated fields, pastures and orchards.

And even their pattern is inevitably disturbed. Ask concerning a boasted bit of unplowed prairie: almost every time you will be told, "Oh, yes, we cut it for hay every year." And the custodians of the bit of virgin timber carefully remove dead trees blown down by the wind.

But cutting wild grassland for hay always changes it. At haying time certain of the plants are bound to be in bloom, or in early and immature seed. The offspring that they might have if left undisturbed are lost or diminished, and to that extent the makeup of the vegetation is artificially altered.

Further, in neither forest nor prairie of the present time is anything like the old animal life to be found. Bison and pronghorn antelope are far away, elk and deer likewise. They were as much part of the life-complex of the natural woods and prairies as were the plants themselves. And under present-day conditions not much can be done to bring them back.

All this is not an accusation of futility leveled against the keeping of little wilderness areas. Quite the contrary; we should keep what fragments of the once seamless robe we are able to preserve. But we should not nurse sentimentally mistaken notions about their present nature.

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