A Dog's World—*Cont'd*

fading to gray. At such a time a moving object against the gray would catch the eye sharply, which may account for the dog's quick alertness at any moving object.

Studying dogs will not only reveal the facts about a dog's behavior. There are a tremendous number of human problems that can be worked out with dogs, Dr. Watson believes.

"I think we can produce psychopathic dogs and thus shed light on nervous diseases," he declared.

At the Pavlov laboratories, Anrep produced a nervous state in a dog, Dr. Watson pointed out. The dog learned that food appeared at the sight of a luminous circle, but not when an ellipse was shown to him. Then the physiologist began to make the test harder by showing the dog ellipses that were more and more rounded, like the circle. When the problem became too hard, the dog could not make decisions and began to be nervous. It wriggled and squealed, and tore off the apparatus that was attached to it, and in general suffered from what a human being might call a nervous breakdown, if he were placed in a situation where the problem was too much for him.

"Society will not let scientists produce nervous diseases in men," said Dr. Watson, "but when we know how these conditions become established, we can more surely proceed to remove them. It can be done with dogs, and the field is all new. It opens up a world of possibilities in establishing fears and removing them. We can make a dog that would fight another dog of any class or type, and we can make a coward of another dog."

Children's feeding habits are another problem that can be tried out on the dog, with enlightening results, Dr. Watson believes. In some of the polar expeditions, dogs developed an abnormal feeding condition because they could get nothing to eat except rotten meat. When the dogs returned to civilization, they were so accustomed to this food that they could eat nothing else, and the problem of building up new habits of normal eating was a difficult one. When a condition of this sort is understood in a dog, and when the dog can be reconditioned, it may be easier, Dr. Watson says, to cure a child's unreasonable aversion for spinach or an abnormal habit of licking paint off a chair.

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Radio Produces Artificial Fever

Physiology

A brand new method of experimentation in physiology that may very likely prove a new method of cure for certain diseases is opened up by recent work at the Albany Medical College by Dr. Helen R. Hosmer. She has been making a careful study of the effects on animals of short radio waves of from 25,000 to 10,000 kilocycles (12 to 30 meters), and will make a preliminary report of her work in the forthcoming issue of *Science*. The effect was noticed when bystanders around a 20-kilowatt, 5-meter transmitter found that their temperature was raised. The mouth temperature of one person rose 2.2 degrees in fifteen minutes, while others showed a somewhat smaller rise, or fever.

Dr. Hosmer has measured the effect of the waves from a special 750-watt transmitter, furnished for the purpose by the Research Laboratory of the General Electric Co., in heating a weak solution of ordinary salt. Such a salt solution is very similar to the fluids of the body in its behavior. The rate at which the temperature of the solution rose depended on the wavelength and the strength of the solution. With a frequency of 25,000 kilocycles, corresponding to 12 meters, a strength of one part of salt to 2000 of water was heated most rapidly, while with 10,000 kilocycles (or 30 meters) a solution of only half this strength was heated at the fastest rate. The liquid was placed in a tube between two parallel metal plates connected with the transmitter.

When a tadpole was placed between the plates, its temperature rose three degrees in 31 seconds while it was alive and 12 degrees in 2 minutes after it was dead. This was with a single tadpole, when there were a number together the rate of heating was higher. Experiments were also made with rats.

Though Dr. Hosmer points out the extreme danger of exposing human beings to these waves until much more is known about them, she states that it affords a new and important field for the experimental physiologist. Now he can induce fever at will without introducing poisons, bacteria, or other foreign bodies into the blood. As malaria has been found useful in the cure of progressive paralysis, an effect believed to be due to the heating of the body by the malarial fever and consequent killing of the germs, fever caused electrically may prove useful instead. This would eliminate the bad effects of the malaria.

Similar experiments along this same line, but without such powerful apparatus, have been made by Dr. W. T. Richards of Princeton University, and Alfred L. Loomis of the latter's private laboratory at Tuxedo Park, N. Y.

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Indians Neglected Jewels

Anthropology

Native Americans, who preceded the white man in the possession of this continent, seem to have made little effort to mine the treasures in their reach, according to Dr. George F. Kunz, well known authority on precious stones. Although diamonds have been found in thirty-five localities in the United States, they were never worked by prehistoric Americans. With all the gold in California, there was no gold mined or worked by Indians of that particular region. It was the Spaniards who really set the Indians to hard labor in the search for precious stones and metals.

How public opinion can help or hinder the progress of American archaeology is pointed out by Dr. Carl Guthe, of the committee on state archaeological surveys of the National Research Council. There is considerable digging among American antiquities by amateurs and traders who do not realize that the old pottery, beads, and other relics are really parts of important historic documents, Dr. Guthe said. Removing such things from the soil without first carefully recording all evidence as to their age and significance, and then making collections out of these isolated specimens is about as useful as cutting the "ands" out of valuable old manuscripts and marveling at the different penmanship of the old writers. The great importance of archaeological expeditions is not the collections they can make but what new things they can learn about the past civilizations of the world. Public opinion condemning the practice of spoiling American antiquities for science would be more powerful than legislation, he said.

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