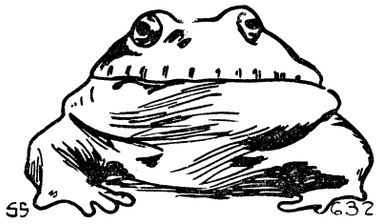
BIOLOGY

NATURE RAMBLINGS

By FRANK THONE



A Bug's-Eye View

Imagine yourself, if you can, in the position of a bug or beetle laboriously climbing a grass stem or stumbling along over the rough and pebbly ground. You haven't much sense (we are assuming you are completely a beetle, of course) and your small compound eyes are exceedingly near-sighted, so that you blunder up against mountainous clods, and with more persistence than judgment climb over them rather than go round.

Then you come to what looks like another clod. It is gray or brown, like the earth; it is completely motionless; it seems to be quite devoid of life. Too late you notice that its underside is white, as no clod is, and that at its summit there are two great, round, staring pop eyes looking at you with cold calculation. Then something like a sticky feather bed descends on you with lightning speed and force, you are jerked through the air, and—that is the end of you. The toad has whacked you with his protrusible tongue and licked you back into his wide mouth, the bourne from which no insect traveler returns.

Once in a while one of these live insect traps catches a Tartar. By way of experiment, a medium-sized but very peevish stag beetle was once offered to a large bullfrog who hadn't had a meal for two months. (Frogs and toads and their ilk can keep amazingly long Lents.) The frog instantly snapped up the beetle, which must have taken hold of his tongue or the lining of his throat with his formidable pincers as he went down. For the frog immediately displayed symptoms of most intense internal discomfort. But eventually he must have had the better of the argument, for the next day he appeared none the worse. And—evidence perhaps of a most astonishingly short memory—he snapped up another beetle (dehorned this time), as eagerly as he had swallowed the first.

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RADIO

Greater Radio Accuracy

Radio measurements are now made a thousand times as accurately as four years ago. When in 1923 radio engineers made their measurements to an accuracy of 1 per cent., they now go to a thousandth of a per cent., Dr. J. H. Dellinger, in charge of the radio laboratory of the U. S. Bureau of Standards, told the meeting of the American section of the International Union of Scientific Radio Telegraphy, held in Washington recently.

Part of this increased accuracy has been due to the use of the piezo-electric oscillator, Dr. Dellinger explained. With this device a small crystal of quartz, between two metallic electrodes, can control the wave length of a broadcasting station to a considerable degree of accuracy. However, Dr. Dellinger stated, the use of the crystal by no means dispenses with careful adjustments. By the use of the crystal oscillator it is easily possible to obtain an accuracy of a tenth of a per cent., but for a higher degree of accuracy, all the conditions, such as the temperature of the crystal, must be carefully controlled.

If American and Canadian broadcasting stations do not keep to their proper wave lengths, it will not be for the lack of accurate standards, for Dr. Dellinger told of comparisons made by the Bureau of Standards with the Canadian radio authorities. One of the Bureau's standard crystal oscillators has been sent to Canada for comparison with their standards, and it has been found that the two agree to within a hundredth of one per cent.

M. S. Strock, also of the Bureau, told of their work in disseminating standard frequencies of radio waves. One way of doing this is by calibrating meters sent in by outside agencies with the Bureau's standards, but the most effective way is by the use of transmitting stations themselves. "The basis of this scheme," he said, "depends upon the fact that a standard of radio frequency may, neglecting the effects of interference, be transmitted over great distances and reproduced at the receiving station with an accuracy equal to that of the transmitter."

This method is used by sending out regularly standard frequency signals from the Bureau's station WWV. Careful check is kept also of the frequency of a selected list of stations near enough to Washington to be received directly at the Bureau. There are thirteen of these standard frequency stations, and in addition, a list of "constant frequency" stations, which includes about 5 per cent. of the stations of the country, are checked a little less carefully. Standard frequency signals have been broadcast from 6XBM, at Stanford University, California; 1XM, at the Massachusetts Institute of Technology, and 9XL, of the Gold Medal Flour Company, near Minneapolis.

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PHYSICS

Sunspots and Radio

Radio reception is associated with spots on the sun, and with the earth's electricity and magnetism, but changes in one can hardly be used to predict changes in the others. Though the spots on the sun have been increasing for the last few years, and studies have been made as to how they correlate with radio reception, and the earth's magnetic and electrical conditions, no exact relationship exists, said Dr. Louis A. Bauer, of the Carnegie Institution. "Neither the number, area, nor position of spots on the sun's visible disc may be taken, however, as a safe index for the prediction of magnetic storms, or the production of electric currents in the earth's crust which are responsible for the interruptions in telegraphy," he said. "There have been notable magnetic storms when there were no spots on the sun's visible disc. The earth's magnetic activity does not cease during years of minimum or of almost no sunspottedness."

However, in the opinion of G. W. Pickard, radio engineer of Boston, there is a more definite relation between spots and radio, especially if the averages are taken over extended periods and thus compared. Over yearly periods, he says, reception varies with the earth's magnetism, which is greatest at autumnal and vernal equinoxes. The mean of 70 passages of large sunspot groups over the center of the solar disc shows that magnetic disturbances occur on the average when the spots are directly in line with the earth, he states.

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A British company has been experimenting with the production of synthetic rubber for 14 years.

Pieces of potato weighing more than two ounces will grow more and better tubers than smaller seed pieces.