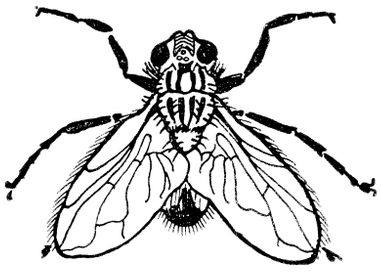
ENTOMOLOGY

NATURE RAMBLINGS

by Frank Thone



Misplaced Sympathy

➤ ONE OF THE most popular nursery rhymes, a couple of generations ago, was:

Baby bye, here's a fly,
Let us watch him, you and I—
How he crawls up the walls,
Yet he never falls!

Imagine a present-day nursery jingle calmly assuming the presence of flies in the same room with the baby! And that isn't the whole of it. The next couplet goes on to say:

I believe, with six such legs
You and I could walk on eggs.

Food that flies have crawled on is now regarded as contaminated. Even if the fly has been only on the outside of the eggshell, we have a creepy feeling that that egg can be redeemed only by boiling.

Old-time toleration of the now-intolerable insect is reflected also in an old favorite German lullabye, which despite the war still figures occasionally in recitals in this country. The watchful mother bids her child, "Sleep on; I'm brushing the flies away from you."

All this dates back to a time when flies were considered only a minor nuisance, not as a menace to health, and when our esthetic sensibilities were not disturbed by a widely publicized knowledge of the fly's filthy breeding and feeding habits. When the terrific typhoid incidence of the Spanish-American War in 1898 made us more acutely fly-conscious, the fly soon ceased to be regarded as a relatively harmless, rather interesting insect, and house screens changed from a semi-luxury to an accepted necessity.

So different was the mental attitude of our ancestors toward flies that they actually wasted a good deal of misplaced sympathy on the now repulsive insects. "The Spider and the Fly" was a favorite ballad in the later nineteenth century; and there was a long poem of the temperance-preaching era in which the wicked saloonkeeper was portrayed as a spider and his bemused, befuddled customer as a poor, harmless, foolish fly.

It is worth noting that the literature of the past 25 or 30 years contains practically no reference to flies as innocent or even interesting.

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EXPLORATION

Next Steps for Science In the Study of the Arctic

By PERE ARTHEME DUTILLY

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Excerpt from an address before the Science Talent Institute.

➤ ALL THE PROBLEMS of the Arctic may be regarded for their own sake or in relation to some human need. Personally I prefer to consider them from the point of view of human geography and in relation to man. Bringing them together thus under the aspect of the habitat of the natives, I try to understand their influence upon his customs and ways of life. To understand the life of the inhabitant of the Arctic, the Eskimo, the Samoyede, the Tchuckchi, we must know his country, his geography, his geology, his soils, his climate, his flora and fauna. And it is not certain that polar radiation, winds, clouds and precipitations, glaciers and icebergs, tides and ocean-currents, atmospheric refractions, the magnetic pole and the aurora, are without an influence on the inhabitants of the great polar night and day just as great perhaps as the flora and fauna. But let us pass over all these things and confine ourselves to the flora.

There is a law governing the distribution of population on the globe. This is: A country can contain only as many inhabitants as it can nourish. Now these food resources are essentially vegetable; for man feeds not only on plants but on animals which are nearly all herbivorous. The very true observation has been made that it is not really the reindeer which makes life possible in the high latitudes and severe climate of Asia and North America, it is rather the lichens or mosses which reach those latitudes and which nourish the reindeer. Thus, the Antarctic is not populated, because no plant can grow there. Plants are more dependent than man on the climatic factor. The climate, however, is not the only influence on the life of plants. The nature of the soil has its importance also.

Rather than dwell on the purely climatic classifications, it is therefore more logical to determine the climato-botanical classifications of human life.

Let us leave aside the equatorial zone with its lofty virgin forests and its wild and uncivilized peoples and also the tropical, subtropical and temperate zones and consider only the frigid zone. As one approaches the pole, the forest becomes thinner, the temperature becomes lower, the precipitation less abundant, the soil becomes almost continually frozen and arboreal vegetation becomes impossible. The tree-limit crosses the 70th parallel and reaches 71 degrees north in Europe and Asia, where there are found a few birch-trees or larch-trees; but in Canada the tree limit does not go to the 68th parallel.

North of that there are only grassy spaces, and finally the grass itself disappears before the moss and lichens. A few dwarf birches, which only exceptionally reach 50 centimeters and which have only the name of trees, wind about the surface of soil. It is the domain of the tundra. The vegetation is precarious, but sufficient to nourish a few animals indispensable to man; the reindeer in Canada and Asia; the musk-ox in Greenland, Ellesmere, the Isle of Devon. It thus permits human populations, but only of the sporadic, dispersed kind, condemned to permanent nomadism in order to obtain its indispensable nourishment. In the southern hemisphere, with neither flora nor terrestrial fauna, the Antarctic

is a frozen domain uninhabited and uninhabitable.

The Arctic is not a whole unit by itself; it is only a zone of the earth. Just as one can not understand our planet completely without studying it as a part of the universe, so one can not grasp the reality and the purpose of the Arctic except in relation to the continent and to the entire globe. The Polar regions have an important part in the economy of the globe. Henri Poincaré, celebrated French scientist, did not hesitate to say that "they are more interesting than all the rest of the earth". In fact, they play a particular part in the physical sciences of every section of the globe. Every branch of physical or natural science, before proposing the solution of its own problem, must put the question "What happens in the neighborhood of the Pole?"

Although nearly entirely explored, the Arctic is not yet known in detail except for a narrow band along its coasts. Our global war and its aviation, penetrating more and more profoundly the Arctic plateau, will discover not only its regions but also its strategic value and will soon make us know it better. Just as the Arctic cannot be separated from the globe and from the universe, so no science furnishes a whole to itself: each of the sciences is merely a section of knowledge or of the universal science on which it depends. Each scientific world has its Arctic zone more or less unkown and unexplored.

It would be the task of each scientist of the new generation to fly over his own table-land, to penetrate it, to explore it, to find its Pole. You will need to have just as much courage, just as much energy and intelligence to reach these polar regions of your sciences as was needed by Peary, Nansen, Nobile, Schmidt and Charcot in the exploration of the polar regions of the globe.

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ENGINEERING

Electronics Provided World With Ignition Rectifier

By DR. JOSEPH SLEPIAN

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Excerpt from an address before the Science Talent Institute.

➤ ABOUT 1930, the use of stainless steel and light metals was rapidly expanding, particularly in transportation equipment, and methods for rapid electrical welding were devised. For welding of such metals it is necessary to use a rapid sequency of accurately measured pulses of electric current, accurately timed. Mechanical switches, because of their inertia, were not practical for controlling these current pulses. It was very natural by this time to turn to electronic science for the answer, and because of the large currents involved, an electro-ionic type of tube was indicated and particularly the mercury arc tube, with its indestructible mercury pool cathode made electron emissive by means of a cathode spot.

However, the only reliable means for starting a cathode spot known at that time was that of mechanically breaking a circuit comprising the mercury pool and an auxiliary electrode, and again mechanical inertia introduced insuperable difficulties. What was wanted was a purely static means for initiating the cathode spot at great frequency and under perfect control.

Electronic science gave a beautiful solution to this problem. A rod of high resistance material was stuck down into the mercury, and current passed down through the rod into the mercury. Analysis of electrical conditions at the junction of the rod with the mercury indicated that there would be there a large concentration of current, and an intense field, just the conditions for starting a cathode spot. Experiment bore out this expectation. Sure enough, when a few amperes passed down the resistance rod, a cathode spot appeared on the adjacent mercury. This could be done as quickly and repeatedly as desired. The small current for thus initiating the cathode spot could be readily handled by a more usual thermionic, grid-controlled, electro-ionic tube. After the cathode spot was formed, thousands of amperes needed by the weld would pass through the mercury arc tube. Thus the ignitron was born. It immediately found wide application in thus electronically controlling the welding of these new materials.

It was then found that the use of this gift of electronic science, the mercury-arc ignitor, permitted a radically new design of the high-power mercury-arc rectifier with a better efficiency and greater reliability than had been attained before. Hence we find that in the great expansion of production of aluminum and magnesium occasioned by the war, the tremendous direct currents needed for electrolysis are being supplied by the new ignitron mercury arc rectifiers.

These examples are only a few of the instances where electronic science is modifying and improving the apparatus of the electric-power industry. We may be quite sure that the next steps in electrical engineering will include further improvements in electro-ionic apparatus, and wider applications.

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Iraq, the traditional site of the Garden of Eden, in normal times exports large quantities of oil and dates.