SCIENCE

Science Used, But Not Heeded, Is Plaint of British Leader

Disclaimer of Science's Responsibility for War Registered At Opening of British Association Meeting in Cambridge

LORD Rayleigh, president of the British Association for the Advancement of Science, in his address opening the Association's annual meeting at Cambridge, declared pessimistically, "The world is ready to accept the gifts of science to use for its own purposes, but it is difficult to see any sign that it is ready to accept the advice of scientific men as to what those uses should be."

Disagreement with their leader's pessimism is already being registered, however, by many British scientists, as well as by some of the foreign visitors who attended the meeting. A surprising number of the more optimistic scientists hold that there is a growing movement among leaders, showing solid determination that scientists shall have a say regarding the utilization of the riches they bestow upon civilization. It is probable that scientific liberals will demand more than mere fact-finding roles for themselves and insist that political and economic leaders take scientific advice in running the world.

Not Responsible

Lord Rayleigh challenged the idea that science is responsible for application of its own discoveries to the purposes of war. He pointed out how the Chief of Staff of the British Army in 1908, five years after the successful flights of the Wright brothers, had scorned aviation as of no military value.

Lord Rayleigh declared, "The application of the fundamental discoveries of science to the purposes of war is altogether too remote for it to be possible to control such discoveries at the source."

National hoards for emergency purposes are already showing a tendency to take the form of food reserves rather than gold reserves, it developed in discussion by J. M. Keynes, C. B., of Cambridge University, noted writer on economic questions. As he summed it up:

"It is an outstanding fault of the competitive system that there is not sufficient incentive for the storing of raw materials so as to average periods of high and low demand, except by means of excessive price fluctuations. There is, therefore, a prima facie case for government action to supplement this deficiency, which is not easily supplied by the competitive system from within.

"In present circumstancs three considerations combine to reinforce this prima facie case: (1) storage for war purposes; (2) with the object of mitigating the fluctuations of the trade cycle; and (3) the stabilization of prices by holding some part of the central banking reserves, not in gold, but in a composite commodity."

Hot-and-Bothered

First understanding of exactly what happens within the hearts of atoms, showing that they get hot and bothered and finally go smash, poetically like the explosive ending of a love idyll, was presented by the Danish Nobelist Neils Bohr.

When the nucleus or heart of an atom is subjected to bombardment with electrical particles, the events resemble on a small scale what happens when you heat up an ordinary larger object. At first, energy is added and a semi-stable compound nucleus is formed. Then the whole thing either goes to pieces or deactivates itself by radiating away the energy that has been shot into it.

We could learn about cosmic rays much more rapidly if it were not for the unfortunate circumstances that the earth has an atmosphere. A visiting German scientist, Prof. E. Regner of Stuttgart Technical College, told of some of the troubles introduced by the presence of such a lot of air over the earth.

"Unfortunately there are great experimental difficulties in the exact measurement of cosmic rays at great heights," he said. "Neverthless it is firmly established that a transition effect exists at the limit of the atmosphere, which is shown by a detectable maximum in greater heights."

The sun's behavior is another disturbing element, Prof. Regner stated. When Old Sol stirs up a magnetic storm on earth with a burst of unusual activity in his own massive body, there is a corresponding increase of cosmic ray activity at greater altitudes on earth, while at the same time, paradoxically enough, the cosmic ray activity at sea level diminishes.

Amazingly "modern" is the broken skull of an exceedingly early Stone Age man discovered at Swanscombe, associated with extinct elephants and other animals that disappeared from Europe with the passing of the Ice Age. This important fossil was discussed by a group of seven scientists, who tackled the question from all possible angles.

Kin to Ourselves

Although this earliest of Early Britons was an exceedingly crude fellow, so far as his tools and other cultural achievements are concerned, he was not a Neandertaler, or a Heidelberger, or a member of any of the other clumsy, beetle-browed races we have been accustomed to regard as dominating the dawn of the Age of Man on this planet. He was like us, a member of the species *Homo sapiens,* so far as all the evidence now in hand can be interpreted.

Islands played a classic role in the development of the doctrine of evolution. Darwin was impressed with the effects on animals and plants of ages of isolation on the Galapagos; similar phenomena on the smaller islands of the East Indies had a like effect on the mind of Alfred Russell Wallace.

Ecological Isles

But isolation can produce evolutionary effects without any islands, it was pointed out by several speakers. Animal and plant communities can be surrounded with conditions on land that prevent their migration just as surely as though they were marooned in the midst of the sea. For example, a forest may be surrounded by grasslands which many of its species are quite unable to cross, or Alpine species may be isolated if the mountain range is in the midst of a desert. Effects of this kind of isolation, termed "ecological isolation," were discussed by Dr. W. B. Turrill, of the Royal Botanic Gardens at Kew.

An even narrower isolation is possible, when the nature of an organism, or the minute interior structure of its cells, prevent it from interbreeding with species that surround it and are somewhat like it, but not sufficiently so to permit successful mating and reproduction. These types of isolation, known respectively as genetic and chromosomal isolation, were the topics of Dr. C. D.

Darlington of the John Innes Horticultural Institution and Dr. D. G. Catcheside of King's College, London.

Farm mechanization has not proceeded as far in Great Britain as it has in the United States, but Dr. S. J. Wright, deputy director of the Agricultural Engineering Research Institute at Oxford University, sees its coming to the islands without very great misgivings.

"Mechanization is neither a serious menace to our rural amenities nor a royal road to prosperity," he declared. "Most of the changes for which mechanization have been blamed are due to purely economic causes, and in the long run, agriculture can absorb mechanization without prejudice to its own interests. Moreover, under present conditions, only the machine can give the agricultural worker the leisure and amenities which he is entitled to demand."

Science News Letter, August 27, 1938

CHEMISTRY

Government Chemists Make Wool-Like Fiber From Casein

TWO U. S. Department of Agriculture chemists have discovered a method for making a wool-like fiber from casein, a component of skim milk. Somewhat similar to an Italian method by which a wool-like fiber has been made for the last three years, the process is being patented under the public service patent law. Discoverers of the process are Stephen P. Gould and Earl O. Whittier, both of the Bureau of Dairy Industry.

To make the fiber, casein is softened in water and dissolved in caustic alkali. It becomes a thick, sticky mass, which is carefully worked into the proper consistency by aging, addition of modifying agents and dilution. The mass is then forced through multiple spinnerets of the kind used in making rayon. The fibers are separated and hardened in an acid bath containing formaldehyde and modifiers.

Synthetic fiber produced in this manner has a chemical composition almost identical with wool except for a lower sulfur content, it is claimed. The fiber, it is also declared, is faintly yellow in color and resembles washed and carded Merino wool, the finest size marketed.

The casein fiber has the characteristic fine kink of natural wool and may be blended readily with natural wool. It has an advantage over kinky fibers made from plant materials in that it takes wool dyes.

Because the fibers are smooth rather than scaly, the new material cannot be felted. It does not shrink as much as natural wool, it is declared.

Similarity of manufacture to the rayon manufacturing process leads the two chemists to believe that its manufacture can be readily carried out in rayon plants by the substitution of casein for cellulose and of different chemical reagents. The two chemists believe it can be produced for fifty cents a pound, approximately the same price as rayon.

Casein is already used for the manufacture of a wide variety of plastic products, such as billiard balls, and for paper coating. Despite the possibility of expanding the market for casein, which comprises three per cent. of skim milk, Bureau scientists do not believe production of milk for its casein content alone would be profitable.

Science News Letter, August 27, 1938

EVOLUTION

Evolution at Work Seen in Moth Study

EVOLUTION at work in quite recent (geologically speaking) time, and very probably still at work, has been traced with the help of some big moths, by Dr. W. R. Sweadner of the University of Pittsburgh.

Dr. Sweadner's subjects were the common and widely distributed cecropia moths — big, hairy, handsome fellows with crescent-shaped white spots in their wings. Although they all look rather alike to the casual observer, there are enough differences in structure and marking to separate them into eight distinct species, spread clear across North America. Each species has its own territorial range.

Examination of Ice Age history makes it highly probable that during that revolutionary epoch there were three species of these moths — eastern, central, and western—each kept away from its neighbors' range by natural barriers, which operated not directly on the insects but on the food plants on which they depended.

As the Ice Age drew to its close, the trees and shrubs on which the cecropia caterpillars feed followed the retreating edge of the glaciers northward. Well up in Canada, the range of the plants spread to east and west, and the moths extended their range with them.

This brought the hitherto separated species into contact. Interbreeding occurred, and played a very important part in the development of several additional species. Indeed, one of the species now recognized is considered by Dr. Sweader to be merely a complex of hybrid intergrades between two overlapping older species, and not a distinct group at all.

Dr. Sweader demonstrated the possibility of producing definite new forms by cross-breeding the various species in the laboratory.

Science News Letter, August 27, 1938

TOO CLOSE FOR COMFORT

Artificial lightning on a tantrum missed this engineer by a scant two feet as it broke away from its prescribed path in the Westinghouse high voltage laboratory at Sharon, Pa. It ran down the partition protecting the engineer, only a fraction of the 50,000-ampere, 3,000,000-volt bolt remaining in the transmission pole.

As far back as 1860, photographers recorded an eclipse of the sun.