Fire Prevention Is Farm Relief

Chemistry

Solving the problem of spontaneous combustion will be an important contribution by science to farm relief, R. W. Dunlap, Assistant Secretary of Agriculture, pointed out to the Conference on Spontaneous Ignition and Heating of Agricultural and Industrial Products.

Spontaneous combustion in barns and storage bins and haystacks costs the farmers of this country $30,000,000 a year by estimate, yet little attention has been paid to this loss, he said.

"I do not recall an instance during the past eight years, when volumes have been printed concerning farm relief, in which this matter has even been mentioned as a means of helping the farmer," he added. "It is through this avenue and many other similar avenues that full relief will be obtained, and it is high time that our scientists were being supported financially and otherwise in solving this problem which is so costly to the American farmer.

"The Department of Agriculture has been doing some work along this line for many years, but the financial support it has received has not been sufficient to enable it to make much headway. It is hoped that more funds can be provided so that this important work can go forward more rapidly."

The only way to find out how to store agricultural products so that they will be least liable to destruction and damage by spontaneous ignition is for scientists to learn the exact nature of the chemical processes which take place in masses of materials that heat spontaneously, the Assistant Secretary stated.

The strange phenomenon of hay racks catching fire through no human agency was recognized as a natural process by wise men of old Rome, and yet two thousand years later the process is still as baffling and inexplicable to modern science as it was to Columella and Pliny. Citing the knowledge of ancient observers regarding spontaneous combustion, Dr. Henry G. Knight, chief of the U. S. Bureau of Chemistry and Soils, outlined a program of scientific research which would solve the mystery and enable mankind to forestall the destructive process.

"There is evident need of careful investigation of the exact conditions that produce the spontaneous ignition of agricultural materials as the basis for our future course of action," he stated.

"It will require a cooperative investigation by chemists, bacteriologists, and engineers upon quantities of materials sufficiently large to duplicate actual farm conditions."

Outlining the points requiring special attention, he said:

"Chemical analyses should be made of the fresh material and the chemical changes which take place throughout. the heating period should be noted carefully. The rate of heating in different parts of the mass should be determined. The avidity for oxygen of the fresh and fermented material should be studied. The migration of moisture throughout different parts of the experimental material should be carefully observed. The production of gases and their character should receive study. The effects of aeration at various stages of storage should be recorded. Studies of conditions existing in the areas of high heats should be carried on, and the various methods of curing in the case of hay and the effects of adding other substances such as salt to hay and to cattle feed should receive special study.

"Along with this work and based upon it should be studies of methods directed at the reduction of spontaneous heating and actual firing of agricultural materials."

Spontaneous ignition costs American farmers millions of dollars a year, and the chief products which go up in smoke or are spoiled for use by this cause are hay, grain, and horse manure, the chemist stated.

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Lichens as Tree Enemies

Forestry

Reindeer moss, the crisp and curly lichen that is the chief dependence of reindeer in the far North, is an enemy of forest growth farther south, reports Anne E. Allen of Cincinnati, in *Ecology*. This lichen is by no means confined to the lands where reindeer pasture, but grows over great areas, especially as a ground cover under trees, as far south as Florida and Mexico.

It forms dense mats like fine shavings, and the seeds of trees and other plants, caught on top, are held away from the moist earth where they might sprout and grow. They just hang there in the air until they die of drought. Even if they do work their way down to the earth and sprout, their troubles are not necessarily over. The reindeer moss heaves and moves about restlessly as it is alternately wetted and dried, and in doing so frequently breaks or uproots seedlings that have pushed their way through its meshes.

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Mind and Body One Function

Biology

The prevalent theory that man's body and his mind, soul, or spirit are two different and distinct things that can be studied independently is attacked by Dr. William E. Ritter, professor emeritus of zoology, and Dr. Edna W. Bailey, of the department of education, both of the University of California, in the *Journal of Philosophy*.

"Almost the whole force of modern culture as reflected in education," Dr. Ritter charges, "tends to shunt knowledge out of the main channel in which it would normally continue. Man's knowledge is in its early stages naively naturalistic, and would become critically naturalistic as the individual develops toward maturity, but for diverting influences."

It is Dr. Ritter's contention that whatever we do and whatever we are, we do and are as living organisms. It is futile to attempt to understand any of our particular activities, such as using our eyes in seeing and our brain in thinking, as if these were independent of our sensory attributes involved in these activities.

"Few paradoxes of human habits are more puzzling to the naturalist," he states, "than is the amount of study mankind may bestow on himself, while neglecting the fact that individuals must be alive in order that there may be other students themselves or men to study. The problem of vision, like all problems concerning ourselves, is inseparable from our nature as living organisms."

The philosopher and the biologist, no less than the physicist, need a theory of relativity, Dr. Ritter believes. An adequate theory of relativity, he states, will have to include quality-quantity as a "continuum" in the essential sense that the Einsteinian theory contains space-time as a "continuum".

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