

CHEMISTRY

Origin of Solar System

Chemist, geologist, astronomer and physicist can reconstruct the process of earth's formation. Cheap grain alcohol can be made from wood waste.

► RECORDS OF the formation of our solar system have not been destroyed. Dr. Harrison Brown of the California Institute of Technology told the meeting of the American Chemical Society in Buffalo, when he received the Society's award in pure chemistry.

Explaining his chemical theories of the origin of our solar system, he said we have only to learn to read these records correctly. The chemist, the geologist, the astronomer and the physicist, working together, can successfully reconstruct the process.

Two groups of planets which differ dramatically in their weights and densities move around the sun. The atmospheres of these planets also differ. Carbon dioxide in the atmospheres of Venus, earth and Mars tells astronomers and chemists that carbon is highly oxidized on these inner planets.

In contrast, the sun's giant outer planets, Jupiter, Saturn, Uranus and Neptune, have methane in their atmospheres, and at least on Jupiter there is an appreciable quantity of ammonia. This means that carbon exists there in a highly reduced state. Opposite kinds of elements are believed to make up the bulk of these two kinds of planets, the heavier metals compose earth and the other dense, solid inner planets. Outer planets are so light that they must be made largely of gases with hydrogen and helium predominating.

What conditions, Dr. Brown asked in his address, would the chemist recognize as necessary to form such a series of planets, supposing our universe to start with the average composition of cosmic matter?

Three groups of elements and compounds could exist, according to Dr. Brown. Those easily condensable would contain metals, oxides and silicates, a small fraction of the whole. Such materials make up the inner planets. Elements and compounds of intermediate condensability include water, ammonia and methane. Jupiter must have been in the best position to take up the bulk of such material.

Left over are hydrogen and helium which would not condense at the temperature of space. These light elements were not so much lost from planetary atmospheres as not captured at the time of formation.

Air and water must, according to this theory, be of secondary origin, formed by reactions among the elements present after the formation of the planets similar to earth. These include not only the inner group but also Pluto, the farthest of the planets. Interpretation of the possible chemi-

cal reactions would allow scientists to read the conditions which must have been present to account for the chemical facts now evident in the solar system.

Alcohol From Wood Waste

► GRAIN ALCOHOL can be made from wood waste at less than one-half the price of production from black strap molasses, Dr. Nathan Gilbert of the Tennessee Valley Authority announced at the meeting.

In the process sawdust and chips are treated by continuous percolation with dilute sulfuric acid. This results in a material similar to molasses which can be used without concentration for cattle feed and for the production of grain alcohol.

Operating difficulties have been overcome, Dr. Gilbert said, and the new process is now in production.

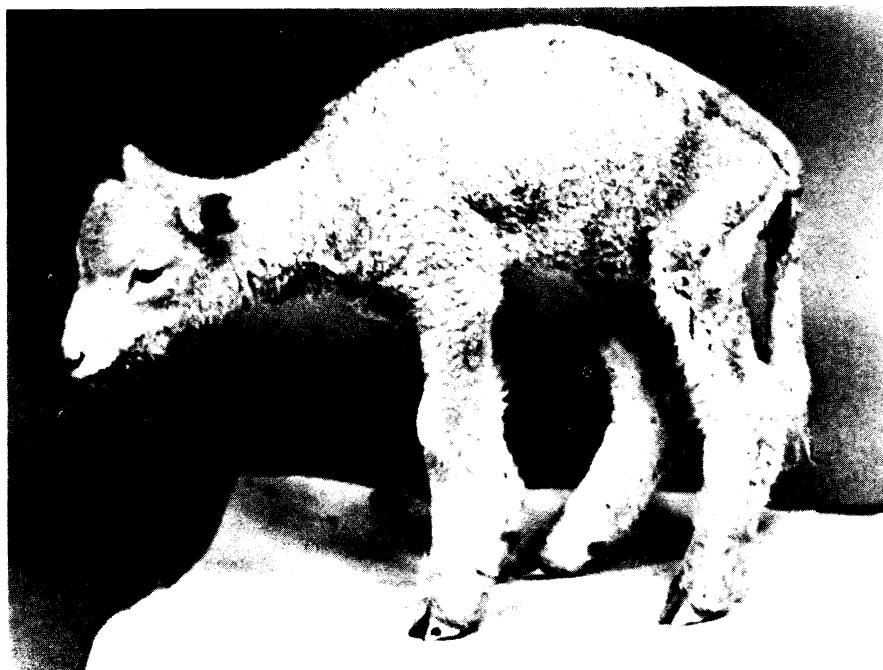
An end to danger from sweaters bursting into flame is promised in a report by

Prof. James M. Church of Columbia University, New York. New organic chemicals which contain phosphorus make fibers fireproof but avoid the trouble of losing the fireproofing material in the wash. Sweaters and other rough textured materials treated with the new fireproofing chemicals can now be worn and washed with assurance that, if a cigarette ash should set fire to the garment, the heat will transform the fireproofing compound clinging to the fibers into phosphoric acid which will efficiently smother both flames and afterglow.

Antibiotics such as penicillin are more efficient in promoting the growth of chicks than are either germicides or detergents having the same kind of effect in the chick's body.

This is found by Dr. Joel R. Stern, Joyce C. Gutierrez and Dr. James McGinnis of the State College of Washington. The scientists are investigating the belief held by some farmers that stimulation of growth by penicillin is the result of mechanical action in killing off harmful bacteria in the chicken's intestinal tract. Dr. Stern and his group reported that the effect of the antibiotic is greater than that produced by much larger quantities of chemicals not of antibiotic origin.

Plutonium, man-made atomic bomb element, builds itself into the bones when it is absorbed by the body, but does not replace the calcium of which the bone is made. The addition to knowledge about



FEWER SICK LAMBS—More lamb chops, veal and steaks may come from research by the American Veterinary Medical Association. Thousands of lambs and calves that would otherwise die this spring from "white muscle" disease may be saved by a new drug containing alpha tocopherol, most potent form of vitamin E. A sick lamb is shown here.