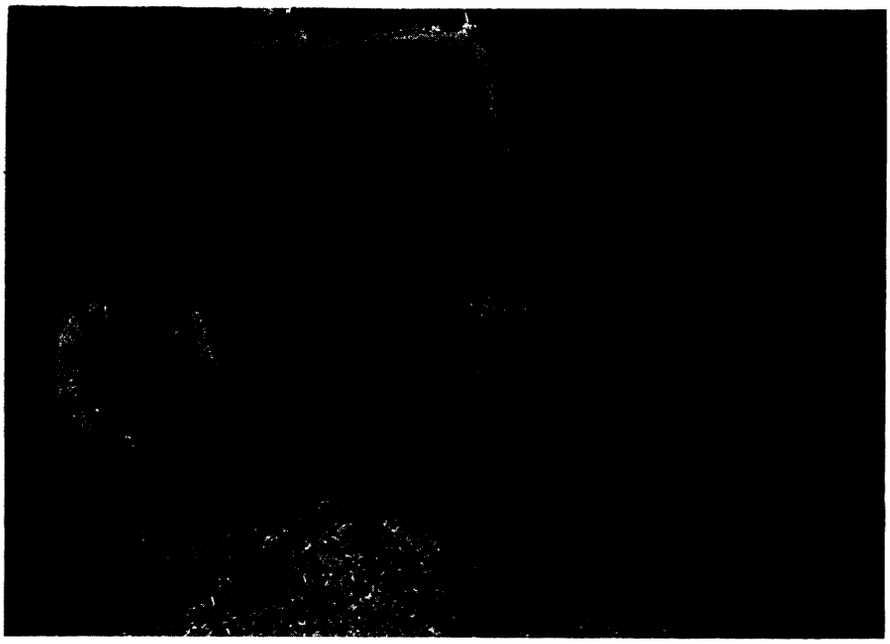

*SHREDDING—Roots, stumps and tree tops are shredded before the turpentine, pine oil and rosin can be extracted. The valuable resinous content is later removed from the chips.*

other 20 years or so. Then second-growth pine stumps may be worked, but not so economically—they are smaller and the rosin content relatively low.

So new methods of extracting gum from live trees are being developed. Today in many areas strips of bark are removed instead of harming the wood by cutting deep into the tree. Treating the streaks with acid or spraying them with 2,4-D has been found to increase the rate of flow and also to keep the gum flowing longer.

The largest producer of woods naval stores products is Hercules Powder Company, a leader in the search for new products and new uses. Newport Industries, Inc., recently completed a $200,000 research laboratory at Pensacola, Fla. Crosby Chemicals, Inc., is also active in the research field.

Better ways of extracting the chemical wealth from pine trees and a wider variety of uses for these products are constantly being developed. Rosin and terpene oils will continue to flow from pines, both living and dead.

Science News Letter, February 5, 1949

CHEMISTRY

# Better Coal Use Expected

## Acetylene could be mother substance for hundreds of organic chemicals and so could ethylene. Hydrogen, as well as methane, could be saved and converted.

➤ COAL today is under scientific investigation as never before, the American Chemical Society was told by Dr. Edward R. Weidlein, director of the Mellon Institute of Industrial Research, Pittsburgh. Fundamental studies are now being made in many laboratories to determine its possibilities, not only in the manufacture of synthetic liquid fuels but particularly as a source of the thousands of essential chemicals which it can be made to yield.

Up to now, the nation's abundant petroleum supplies have discouraged the study of coal, Dr. Weidlein said. Far too little fundamental research has been done with this key mineral. We still do not know what coal is chemically, he said, and until we have this knowledge we are working under handicap.

Half the world's known reserve of coal is possessed by the United States, he stated. This nation has enough to meet all requirements for heat, light, power and transportation for more than 1,000 years at the present rate of consumption. Industrial leaders and technical experts believe that a large industrial development based on coal is in the making, and that a considerable expansion in coal production is imminent.

Atomic energy, in time, may replace coal for the production of power, he continued, but it can not succeed coal as a rich source of carbon compounds. Chemically speaking, the whole range of organic chemicals can be made from coal.

In the past, coal has been the source of the so-called aromatic compounds on which the dye, drug, and explosives industries were founded. Alcohols are among the many other substances which can be derived from coal. By-product ethyl alcohol from two synthetic fuel plants now nearing completion will equal about one-fifth of the nation's present production from all other sources.

Acetylene from coal can be the mother substance for hundreds of organic chemicals, and the same is true for ethylene. Great quantities of free hydrogen are released in the usual coking of coal, most of which is lost. The gas called methane, given off in the same process, is now being converted into valuable liquid products. The hydrogen could likewise be saved.

Wider uses of coal for all purposes are foreseeen by Dr. Weidlein. The petroleum supply picture has changed so radically that national security itself depends upon the development of new sources of liquid fuels, he declared. A World War III would require double the fuels of the past conflict.

Science News Letter, February 5, 1949

AERONAUTICS

# Mock-Ups of Planes Used to Train Pilots

➤ WORKING mock-ups of airplane cockpits and fuselages were successfully used by the Navy during the war in training pilots and crews, and their use is now becoming widespread, the Institute of the Aeronautical Sciences meeting in New York was told by Luis de Florez, president of the de Florez Engineering Company.

The mock-ups were called synthetic aircraft by him. They are so designed and instrument-equipped that they can simulate the flight of any proposed aircraft. They can be used to reduce the risks and probably the costs of design and testing new planes, and make it possible to detect and correct faults before fullscale flight.

By the use of electronic computers, it is possible to portray the flight of the aircraft designed and furnish a preview of its performance. The task of familiarizing and training pilots and crews in the operation of new type aircraft is greatly simplified and made less expensive by these ground-based synthetic aircraft.

Science News Letter, February 5, 1949

Quarternary ammonium compounds are increasingly used as *germicides* and in cleaner-sanitizer preparations; they are derivatives of ammonium hydroxide or its salts in which hydrogen atoms are replaced by organic radicals.