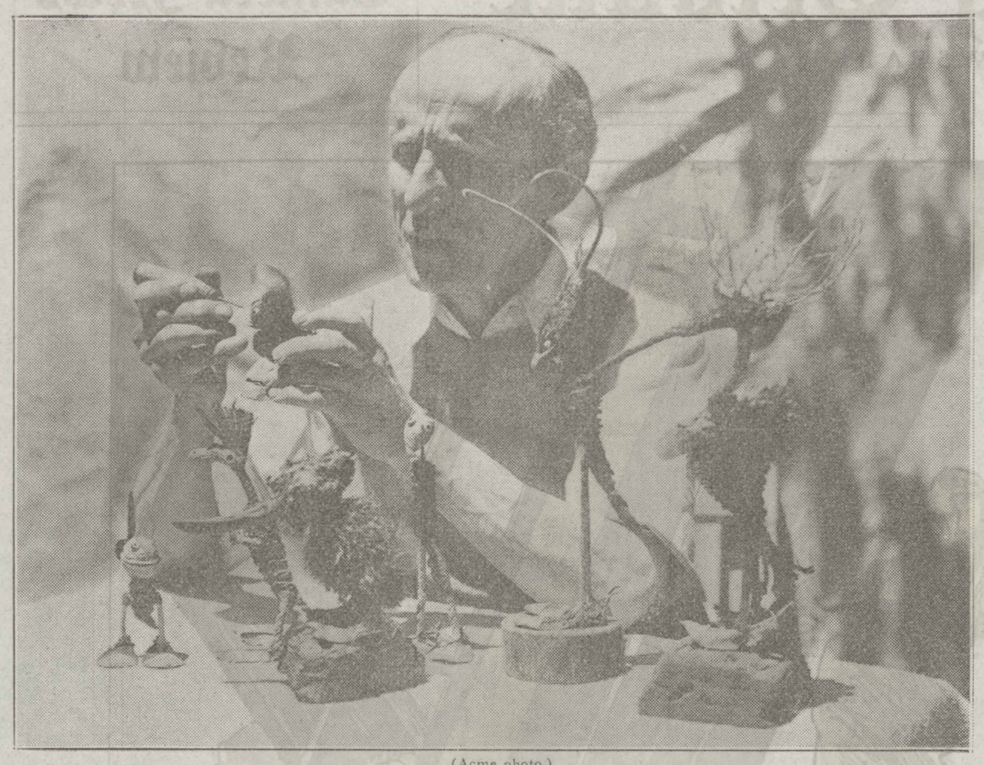
Bird Caricaturist of Yosemite



(Acme photo.)

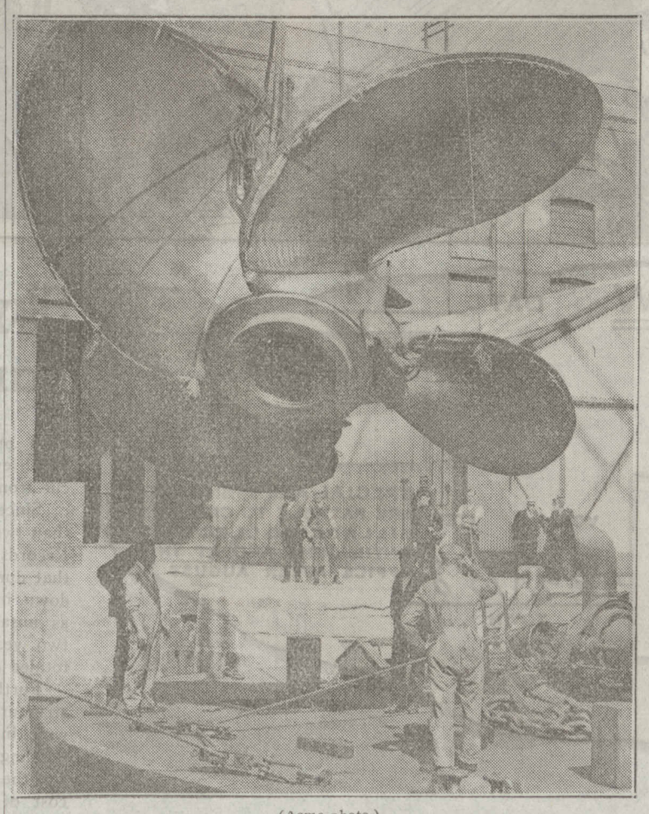
OUT of twigs, grass, and anything else that comes to hand, Herbert Sonn, known as the "bird man" of Yosemite National park, creates funny little caricatures of birds. Mr. Sonn is a naturalist by profession, making the bird caricatures for recreation. His work is so original, however, that he has attained a world reputation as an eccentric artist. This picture shows Mr. Sonn with a few of his caricatures. He makes each one with painstaking care, and because of his knowledge of real birds each caricature bears a striking resemblance to the species of bird represented.

Driving a Car by Remote Control

(Acme photo.)

DEMONSTRATING the possibilities of radio, Maurice J. Francill is touring the country, showing how he can control an automobile with a radio set and a "divining rod," really the antenna of the set. Mr. Francill, as this picture shows, gets in front of the car; and when the power is turned on, he can steer it as well as start and stop it by moving the rod. With a few adjustments the car can be made to shift gears, through radio control. This picture was taken at Union City, N. J.

For World's Largest Ship



(Acme photo.)

THE size of Great Britain's newest and the world's largest passenger ship, the Cunarder 534, may be surmised from this picture of one of the sea giant's four propellers. The ship is now under construction on the River Clyde in Scotland. The propeller shown here is 19 feet 6 inches in diameter and weighs 34 tons. It was made in London and shipped to the Clyde on a floating crane. The cost of each of the huge propellers will be $35,000, or a total of $140,000 for the set of four. The big ship will have a length of 1,018 feet. It will be Britain's answer to the challenge of new German and Italian liners.

How Science Produces Synthetic Rubber

By C. Robert Moulton

SYNTHETIC rubber tires are now a fact in the United States, although the cost of manufacture at present prevents their competing effectively with natural rubber. The synthetic product costs about $1.00 a pound, while natural rubber sells now at 15 cents a pound. The latter product has not always been this cheap. When the demands of the growing automobile industry found the supply of natural rubber inadequate and again when war interfered with the normal relations of supply and demand, natural rubber was high priced. The synthetic product is a guarantee that America will be able to supply its own needs in any such future emergency.

There is an interesting story of research behind the recent announcement of a synthetic rubber, which apparently is every bit as good as the natural product. The story goes back over fifty years to the work of G. Bouchardat, who in 1879 first recognized that isoprene (C_5H_8) was the mother substance of caoutchouc, the chemist's name for rubber. Isoprene already had been found among the products of the destructive distillation of natural rubber, but the significance of this had been overlooked. Five years later Tilden had prepared isoprene from turpentine and found that it changed spontaneously to caoutchouc.

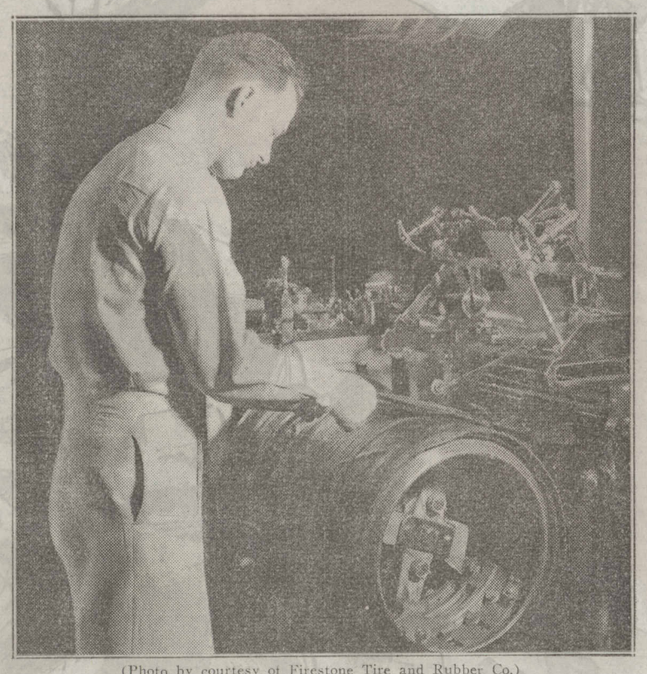
This early work was not made use of by the chemist, for the product was expensive and not of good quality. But by 1910 a boom in rubber planting and research followed the demonstration of the fact that the supplies of wild rubber were not sufficient to meet the growing demands.

Isoprene belongs to the class of chemical substances known as hydrocarbons, so named because they are made up of atoms of hydrogen and carbon arranged in a multitude of ways and giving rise to substances of many different properties, but all belonging to the general class known as "organic" substances. Carbon occurs free in nature in three general forms. One is the diamond, the second is graphite, and the third is in coal and charcoal. Hydrogen is a gas used to inflate balloons. When combined with oxygen in proper proportions it forms water.

Plants take carbon dioxide, a gas, and water and manufacture from them, and a few other elements such as nitrogen, all the different substances found in plants.

(Photo by courtesy of U. S. Rubber Co.)

A native worker gathering latex, natural rubber in its first form, from a tapped tree on a Sumatra plantation.



(Photo by courtesy of Firestone Tire and Rubber Co.)

Natural rubber in the automobile tire plant: Plies—cotton fabric saturated with pure rubber—being assembled by machine.

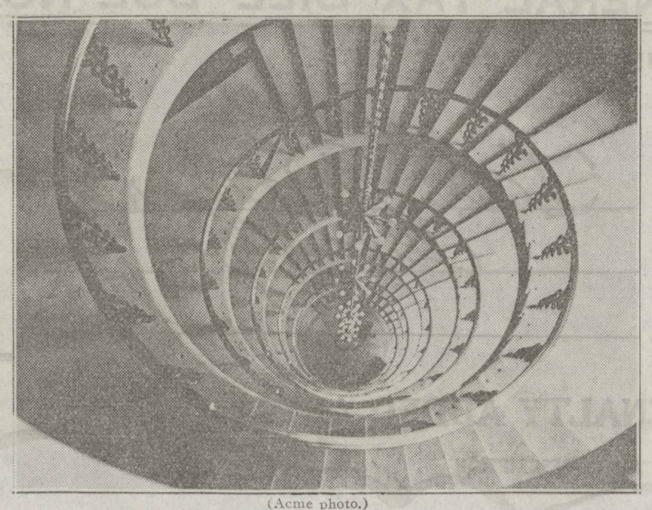
Animals eat the plants (or other animals) and manufacture the various kinds of substances they need. Most of our foods and fibers are organic materials. Coal, oil, and natural gas are derived from organic matter.

The chemist's formula for isoprene is as follows: $H_2C{=}CH{-}C.CH_3{=}CH_2$, which in briefer form is C_5H_8. Calcium carbide is CaC_2. When treated with water (H_2O), lime ($Ca(OH)_2$) and acetylene ($HC{\equiv}CH$) are formed. Two molecules of acetylene can be made to form butadiene, $H_2C{=}CH.CH{=}CH_2$. In isoprene, one of the middle hydrogen atoms has been replaced by the methyl ($-CH_3$) group. Chloroprene is written $H_2C{=}CH.CCl{=}CH_2$. This much organic chemistry with the formulas is given in the hope that it will be useful in helping the reader understand this subject better.

War time in Germany found rubber being manufactured on a large scale from a methyl derivative of isoprene. The process involved the use of calcium carbide, which was prepared from coal and limestone. From the carbide, acetylene and acetone were prepared, and from the latter dimethylbutadiene (methyl isoprene) was made. One plant at Leverkusen near the end of the war was making 150 tons of rubber a month from this source. From the methyl isoprene three types of "methyl" rubber were prepared which differed in hardness, plasticity, and ease of handling. Molded goods, insulating material, and even rubber tires were made from this product, using fillers, elasticators, and other modifiers.

The synthetic rubber tires recently produced in Ohio by the Dayton Rubber Manufacturing company are the result of original work by Nieuwland and Vogt of the University of Notre Dame. These investigators had worked with chlorine derivatives of butadiene (isoprene is methyl butadiene) and had made polymerized products much like rubber. In 1931 the DuPont company made the important discovery that chloroprene (chlorobutadiene) gives rise to a synthetic rubber which is the best product thus far obtained by the chemist. Acetylene from calcium carbide is again the starting point, and salt is used as a source of hydrochloric acid. One of the intermediary products is vinylacetylene. By the process here used, this becomes chloroprene and then rubber. It is an interesting fact that certain other vinyl derivatives are used in the manufacture of a line of vinyl resins for synthetic products of a multitude of uses from which beautifully colored and molded objects and structural materials are made.

Mr. Farley's Stairway



(Acme photo.)

SOMETHING for the taxpayers to look at is this magnificent winding stairway. It is one of many in the new postoffice building in Washington. In this building the business of managing the United States mails is directed by Postmaster General Farley and his army of assistants and clerks. Perhaps the most magnificent portion of the building is that devoted to the private rooms of Mr. Farley, who, it is reported, would prefer less luxurious quarters. The postoffice building is only one of a group of new buildings built in Washington in the last few years to replace old government buildings.

A Happy Ending

(Associated Press photo.)

THIS is a sad story with a happy ending. The dog, a female bull terrier, lost her litter of two puppies recently at the Newark, N. J., dog and cat hospital. By way of experiment veterinarians turned two motherless kittens over to the dog. She ceased grieving for her dead puppies immediately and began caring for the kittens as if they were her own. She washes their faces, suckles them, and keeps them out of harm's way. At the same time, according to the animal hospital officials, the dog appears to be completely contented. It is planned to give the dog complete charge of the kittens until they are grown.