

SCIENCE NEWS

Science Service, Washington, D. C.

SOME PAPERS READ AT THE NEW YORK MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

INDUSTRIAL progress in America is usually attributed to our natural resources, but few people realize that Americans, more than any other people of the world, have been responsible for the epoch-making inventions of the century. This was pointed out by A. A. Potter, dean of engineering at Purdue University, at the New York meeting of the American Society of Mechanical Engineers. Vital, young Americans, initiative spurred by their individual democratic rights being placed above those of the state, have produced some of the greatest of these discoveries. Westinghouse invented the airbrake at 21, for example, McCormick the harvester at 22, and Howe the sewing machine at 27. McCormick with his reaper gave more impetus to mechanized agriculture than any person in any other country. Among pioneer American inventions in the field of communication have been telegraph, transatlantic cable, telephone and many features of the radio. From the invention of the Clermont by Fulton to the patent for the airplane by Wright, Americans have been major contributors to the field of transportation. Many manufacturing processes are also included among American achievements, such as welding, cracking gasoline, vulcanizing rubber and the manufacture of aluminum and plastics. Our patent system, which encourages and rewards creative talent, has been a major factor in the industrial progress of this country, Dean Potter declared.

Infra-red rays are now being used to dry textiles after dyeing and finishing processes, was reported by George Fisher, of the Infra-Red Ray Equipment Corporation. Bombarding fabrics with the rays produces great heat, although infra-red waves themselves are not hot. This property of the rays has been known for some time, but application in the textile industry has only recently been made. Use of infra-red rays produced by gas-heated incandescent refractories has passed the experimental stage. Quite a number of such installations are in industrial operation, performing with excellent results. Since the rays do not heat the surrounding air, the high-speed production of large amounts of heat energy occurs right at the spot where the heat is needed. Operation has proved to be very economical. Steam heat, formerly used, could not be controlled as well as the new method and as a result the fabric was sometimes excessively exposed to heat and baked. Atmospheric burners and other gas-flame units which have been in use wasted much heat to the surrounding air and had other features which prevented drying as efficiently as by the infra-red ray method.

Speeding trains of the future will be powered by diesel electric locomotives which will far surpass anything that we have yet seen, was predicted by B. S. Cain, of the locomotive engineering department of the General Electric Company. Design progress has not stopped despite

standardization required by the war. Instead, war research has produced power plants with greater power in less space with less weight and designed for mass production. When peace comes, locomotive builders are ready to adapt these developments to railroad use. Production for the duration is limited to existing standard sizes and types best suited to wartime needs and emphasis is placed on the most efficient use of the limited material available. Use of small diesel-electric locomotives in industrial service has increased tremendously. These high-speed 150 to 500 horsepower engines are not in as great demand for implements of war as the large low-speed machine.

A shooting stream of gas is used to drive the first gas-turbine locomotive, which was described by Paul R. Sidler, of New York, resident engineer of Brown, Boveri & Company, Ltd. Built for the Swiss Federal Railways, the new-type locomotive has not been tested as thoroughly as desired because of fuel shortage and war conditions. But enough road tests over various tracks have been made to demonstrate that the gas-turbine locomotive not only came up to expectations but surpassed them in some respects. For certain uses it shows marked advantages over the Diesel locomotive, but in general it is not yet a serious competitor. It should be particularly suitable for express service over long distances, in areas where water is scarce and where there is a considerable difference in the costs of Diesel oil as against ordinary fuel oil.

That the use of wood in America's planes is steadily advancing in both quantity and quality, was reported by Dr. Robert J. Nebesar, chief engineer of the Universal Moulded Products Corporation. Aircraft with wooden fuselages and other parts have been shown to withstand shock and vibration very satisfactorily. Both servicing and repairs are inexpensive and comparatively easy to take care of, these presenting no engineering problems. New durable synthetic glues and ensuing improvements in wood processing, such as molding, pressing and other techniques, has resulted in an ever-increasing replacement of war-scarce metals by wood in some types of planes.

THE CONSERVATION OF VITAL MATERIALS

MORE than ten million pounds of nickel, chromium and molybdenum will be saved next year in the production of medium tanks alone, through the research of the War Engineering Board of the Society of Automotive Engineers is reported in the *Journal* of the society.

Cooperation of industry and the military, through research sponsored by the board, is expected to produce other large savings. Materials conservation is now being incorporated in the designs and specifications of new army equipment. Use of low-grade metals is being expedited to release the better alloys for more critical uses.

Recent piece-by-piece study of military motor vehicles, conducted by the board, involving thousands of parts, reduces consumption of vital materials, such as rubber,

aluminum and cork, and utilizes suitable substitutes. Development of cold-starting aids for military motorized equipment is among the current projects. Sufficient progress has been made to supply the Army with satisfactory expedients for this winter. Plans under way expect to make American armed forces the world's best equipped for sub-zero operations.

Other research projects contemplate development of equipment for the American army and navy which will assure satisfactory service in any climate in the world, with both production and servicing using a minimum amount of materials.

An "interim" secondary butyl tire has been developed by a committee created by the board, which appears capable of 15,000 miles of service and satisfactory for synthetic recapping materials. Manufacturers are cooperating in laboratory and field tests with the idea of making the material available for use in 1943.

THE NATIONAL HEALTH

THE national health picture is "pretty good," according to reports of communicable diseases received weekly by the U. S. Public Health Service.

The death rate in large cities has increased some 12 per cent. or 13 per cent. in recent weeks, chiefly because of influenza and pneumonia. Death rates from these two diseases are higher than the three-year average established by the service for basis of comparison since the introduction of the sulfa drugs which have so greatly reduced deaths from pneumonia.

Cases of influenza reported by state health officers have also been increasing, from 1,596 for the week ending November 14 to 1,851 for the week ending November 28, latest on which figures are available. About 60 per cent. to 70 per cent. of the cases for the recent weeks were reported from Texas, South Carolina and Virginia. So far, however, no signs of an influenza epidemic have appeared.

Meningococcus meningitis cases have been running higher all this year than during any year since 1937. The total number of cases for the week ending November 28 were 89, an increase of 25 over the number reported for the previous week. The five-year median figure runs around 30 cases per week for the nation. Only 17 cases have been reported from the nine service commands of the Army. Although the total number of cases in the nation is higher than usual, it does not represent any particular outbreak.

The largest number of cases of endemic typhus fever will probably be reported this year to the Public Health Service. More than 3,300 cases have been recorded so far, most of them from Texas and Georgia. The federal health service has been receiving reports on this disease since about 1930. Endemic typhus fever in the United States is a mild disease, spread by the rat flea, and not to be confused with the highly fatal European typhus fever.

ITEMS

CONTROVERSY over whether atabrine, the anti-malarial just made official in this country, is identical and equal to the original product developed in Germany, has now been settled in favor of America's chemists. A report

issued by the National Research Council establishes the fact that the drug manufactured in this country is comparable in every respect with that produced in other countries, according to the *Journal* of the American Medical Association. Atabrine, chemically known as quina-crine, is now in mass production as a substitute for quinine using the process developed abroad. But chemists here have also found their way through the intricate steps of chemical synthesis which produce the bright yellow crystals used to combat malarial fever. Unpleasant side-actions sometimes accompany the administration of the drug led to the suspicion that there might be defects in the manufacturing process or impurities present. Doubts have been dispelled by investigations in leading institutions throughout the country which indicate that these minor difficulties are inherent in the atabrine itself, as occurs in many standard medicines.

NEW resins are replacing old zeolite minerals and greensands for special uses requiring softened water of excellent quality, such as in breweries, canneries and beverage manufacturers. Extended application of the resins to prevent spoilage of medicinal enzyme preparations, to purify drugs, and to recover vitally needed metals from industrial wastes, was predicted by Dr. Robert J. Meyers of the Resinous Products and Chemical Company Laboratories of Philadelphia, speaking at the Buffalo meeting of the Western New York Section of the American Chemical Society.

WITH two great bulbous projections above the middle ear region, one of the most singular mammalian skull fossils ever seen has been described at the Academy of Natural Sciences, Philadelphia, with a scientific name that means "strange skull": *Xenocranium*. The name was bestowed by Dr. Edwin H. Colbert. The extinct creature, represented only by a skull and lower jawbone, lived in what is now Wyoming some 60,000,000 years ago, near the beginning of the Age of Mammals, in the period called Oligocene by geologists. It belonged to the class known as edentates, which includes modern armadillos and their relatives.

FOSSIL bones of a groundhog that slept too long one winter some scores of thousands of years ago in its burrow on a mountainside in New Mexico tell a story of cooler, moister climate in the Southwest while the North was buried under its mile-thick blanket of ice. The find, and the consequent climatic inferences, are reported in the *American Journal of Science* by Dr. Charles E. Stearns, of Tufts College. The bones were found in a dust pocket, under a long-inactive landslide on a mountainside north of Albuquerque, at an altitude of 5,900 feet. The lowest altitude at which marmots live in that area now is about 4,000 feet higher than that. It is not known whether the animals must have the cooler climate of that altitude; but that is not of vital importance, because the green food on which the animals depend does not grow the year round in the more arid conditions prevailing at lower levels in the Southwest. So the presence of marmot remains at the 5,900-foot altitude argues for a cooler, moister climate at the time they lived there.