SCIENCE NEWS

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THE CHEMICAL TREATMENT OF WOOD

SOFT woods become harder than hard maple and maple wood is made harder than ebony by a new chemical process announced by Dr. J. F. T. Berliner, of the E. I. du Pont de Nemours and Company. It is a development by chemists of the company following a line of research that paralleled studies conducted by the Forest Products Laboratory of the U. S. Department of Agriculture.

This process makes timber markedly harder, stronger, stiffer and more durable, it is claimed. The natural tendency of wood to swell, shrink or warp with changes of humidity is eliminated. Furniture, for instance, made of the transmuted wood can be shipped throughout the world, to tropical jungles or arid deserts, and will remain in condition. Color may be imparted permanently throughout the material by the use of dyes in the impregnating material.

The chemical agent used in this new process is called methylolurea and is made by compounding urea with dimethylolurea. Both these materials are white, water-soluble solids, produced from ammonia, carbon dioxide and methanol, more commonly known as methyl alcohol. Urea results from the reaction of ammonia and carbon dioxide. Formaldehyde, derived from methanol, condenses with urea to form dimethylolurea. Both urea and dimethylolurea are inexpensive chemicals available commercially.

The methylolurea is impregnated into the wood in a water solution. It reacts with the components of wood to form hard, water-insoluble, unmeltable resins within the piece of timber being treated. Heat, such as kiln drying, speeds the process.

The treatment can be used also to harden the outside portion of a piece of lumber without affecting the interior, obtaining results somewhat similar to those obtained in case-hardening steel. This treatment will be found desirable for certain types of construction such as trestles, bridges and towers.

ITEMS

HWA LO-KENG, a self-taught Chinese mathematician, is coming to the United States to lecture at the invitation of Dr. Albert Einstein, professor in the Institute for Advanced Study at Princeton, N. J., according to reports to the Chinese News Service. Professor Einstein is starting a series of lectures on unsolved problems in mathematics by authorities from various parts of the world. Both he and Mr. Hwa will serve as directors of the program as well as lecturers. There will be a total of four such directors. A native of Kingtai in Kiangsu Province, Mr. Hwa is the author of eight dissertations in his field. His two published theses on much discussed but unsettled mathematical problems have aroused great interest among the mathematicians of the world.

QUARTZ filaments, so fine that it would take 60 of them to make the thickness of a human hair, are drawn out in production in a relatively new method by use of a bow and arrow at the Westinghouse Research Laboratories at Pittsburgh. These superfine filaments are for use in the electron microscope to measure or calibrate its magnifying power. The bow, made of tough flexible steel, is mounted on a wooden stock. The arrow is shot out along a groove in the stock. In action the cross-bow is placed in firing position and a small cylindrical piece of quartz attached to the rear end of the arrow. The quartz is heated by an oxy-hydrogen torch until it is just ready to melt. Then the arrow is released, trailing behind it threads of quartz sometimes 20 feet in length.

DR. GUSTAV EGLOFF and Mary Alexander, of the Universal Oil Products Company, reported at the Cleveland meeting of the American Chemical Society that when the motorist of the future talks of how much mileage he gets out of his "gas," he may be using the word literally rather than as a shorthand term for gasoline. Under the necessities of war, more than 165,000 automobiles, mostly in Germany, are using gaseous fuels. Even in this country, some 25,000 buses, trucks and other heavy-duty vehicles employ gases for fuel. All the automobiles in the United States could run, if necessary, on methane (marsh gas) obtained from natural gas, petroleum refining and coal processing.

PHOTOFLASH lamps are satisfactory for the illumination of films taken with high-speed motion picture cameras on continuous moving film at the rate of upward of 2,000 frames per second, Henry M. Lester, of New York City, reported at the recent meeting of the Society of Motion Picture Engineers. He accompanied his description of the methods employed with motion pictures and demonstrations. High-speed cameras are now in use, he said, that produce exposures of from 1/10,000 to 1/30,000 second. Such brief exposures call for illumination of great intensity and high color temperature. Incandescent lamps capable of providing such illumination, especially when operated at voltages higher than their respective rating, have many disadvantages, he stated. Among them are great power requirements, heavy conductors and the development of considerable heat. "Operating on the current of a 6-volt dry cell (Hot Shot) battery one or more photoflash lamps will provide ample light of high color temperature of easily controlled duration," he continued. "Successive flashing of any number of photoflash lamps is accomplished with a Flash Distributor of a simple design."

STANDARD specifications for leather aprons, leather cape sleeves and leather knee-length leggings have been approved by the American Standards Association and are available to those interested. They are the first three in a series of war standards for protective occupational clothing for factory and other industrial workers. These standards provide specifications for the different kinds of leather aprons, cape sleeves and leggings, which the committee considered necessary to adequately protect both men and women working in industrial plants from sparks, molten metal, infra-red and ultraviolet rays, and also from limited impact forces. They cover pattern, design, material and construction.