CHEMISTRY

Now a Second Synthetic Rival For Japan's Natural Silk

Polyvinyl Acetal Resin is Material For New Fibers Claimed to be Strong, Elastic, Waterproof, Fireproof

ANOTHER synthetic resin fiber, that can be turned into lustrous silk-rivaling hosiery for Miss America's legs, was reported to the meeting of the American Chemical Society at Boston.

Known as polyvinyl acetal resin, the new fibers are further cause for headaches among the Japanese for they are synthetic, made-in-America rivals for Japan's natural silk. Silk is the largest single export of Nippon to Uncle Sam.

While chemists at the meeting heard the details of this newest plastic resin wonder, full information had already been disclosed, but little noted, in patents issued at the U. S. Patent Office in Washington during the present summer.

A research team of Carbide and Carbon Chemicals Corporation including Harold F. Robertson, Edward W. Rugeley, Theophilus A. Feild, Jr., John F. Conlon, C. O. Young and S. D. Douglas have been busily piling up patent after patent. Some of them have been issued in the near-record time of 2½ months.

Polyvinyl acetal resin can be produced in fibers as fine as natural silk, virtually as strong, more elastic, waterproof and fireproof.

The basic materials of the newest fibers are salt, coal, lime and air. Out of these cheap and plentiful raw materials are made high molecular weight (7,000 to 13,000) water-clear resins. The actual production consists of polymerizing vinyl halides with vinyl esters.

Many Possibilities

Among the suggested uses of the new fibers, besides the hosiery field, are: waterproof clothing, bathing suits, fireproof awnings silk-like in appearance, fishing lines, fishing nets and seines, acid and alkali-resistant clothing, electrical insulation and curtains for shower baths.

The new fiber material, to be known as "Vinyon," is not yet in commercial production for hosiery. In its properties it is comparable with "Nylon" developed by du Pont chemists, although the latter is made by a different chemical method.

Both fiber resins have been in the industrial "hush-hush" class because no technical details were ever released to the press in the pioneer stages of development and not until long after pilot stage of production had been reached.

Only by a week-by-week search of the voluminous Official Gazette of the U. S. Patent Office was the American press able to learn of these rumored but never-discussed developments.

Other Nations Active

Other nations have not been idle in developing comparable fibers made synthetically. Germany's famed chemical works, the I. G. Farbenindustrie is known to have a synthetic textile thread known as "Pe-Ce" which consists of a polyvinylchloride. This chemical is one stepping stone on which the Carbide and Carbon Chemicals Corporation chemists have polymerized the new Vinyon fiber.

The German fiber is thermoplastic, (molded with heat) and therefore cannot be used in clothing which requires ironing. It is extremely resistant to acids, however, and can be kept for 24 hours in aqua regia without harm. Fishery nets made of it will not rot on exposure to fresh or salt water.

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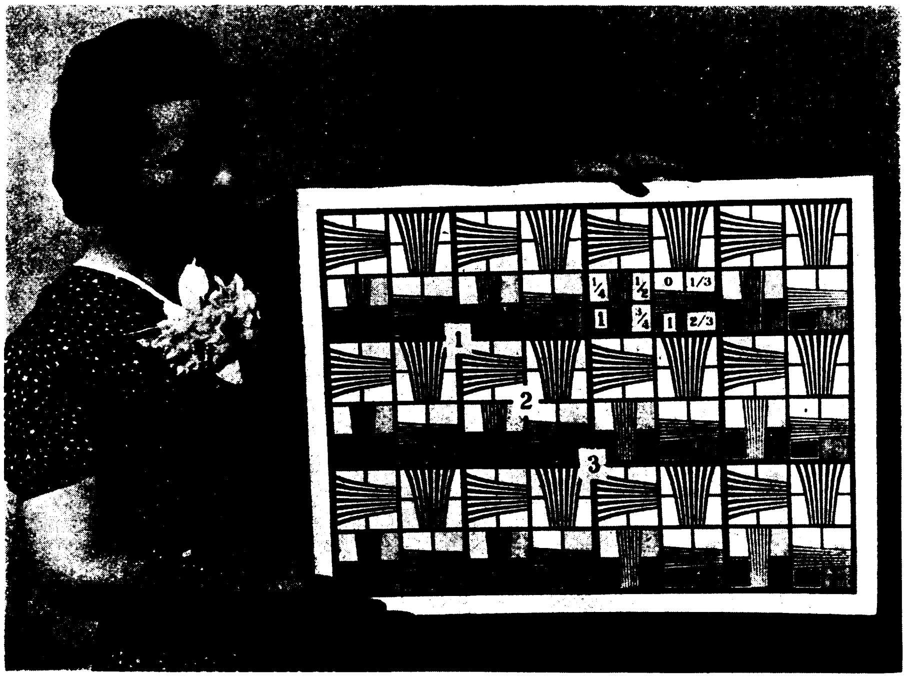
GENERAL SCIENCE

"Ersatz" Education Rules Universities in Germany

JUST as Germany is using large amounts of "ersatz" or substitute materials, such as artificial rubber and artificial wool made from milk, so "ersatz" university training has invaded the halls of learning to which in the days of the Kaiser youths of all nations went for scientific polishing and research baptism.

The Nazis have banished a large percentage of Germany's scientific brains. Even this may not be their greatest loss. If younger scientists were being trained effectively, the research and scientific services might be maintained successfully. But such does not seem to be the case.

Drastic and radical changes in the universities and technical institutes have been many, with more to come in the future. Most serious has been molding of



"EYE CHART" FOR TELEVISION

It doesn't look exactly like the Snellen charts used for your own eyes, but it is used by General Electric engineers to test the television eye and obtain proper detail in images.

the universities to fit the Nazi ideology. Reorganization and unification of study in various fields has been complete. To speed the production of doctors, chemists, and other immediately useful scientists, the period of study has been curtailed. Scientific work and practical training are being tied more closely together.

The armament boom in Germany has caused an acute shortage of qualified chemists, for example, although in the post-war period there was an oversupply of men academically trained in chemistry.

Coincidently with this pressure for technically trained personnel to serve the Nazi state and despite the need of research in building the Nazi war machine, there is a deep disdain for the intellectual worker and the researcher.

Nazi Secretary of Education Rust has told university professors to be teachers first and think less of their publications and research. Nazi Secretary for Propaganda Goebbels declares: "An intellectual is a man in whom civil valor is in inverse ratio to knowledge acquired through studies. . . . This intellectual is in reality an artificially highly bred accumulation of knowledge."

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CHEMISTRY

Find Cheaper War Gas and A Super-Elastic Thread

Nation's Chemists Survey Progress for Science Service; Cite Industrial Developments and New War Materials

A NEW, cheaper and easier way to make deadly wartime mustard gas.

The use of deadly, glass-eating hydrogen fluoride to bring about new reactions for producing new synthetic dyes and other chemicals.

A new kind of elastic thread made from new synthetic "rubber."

These are the three latest achievements in chemistry, that science which day by day builds new industrial achivements for peace and war.

No longer is American chemistry the stepchild of European laboratories as it was in 1914. It is almost self-contained, producing new wonders daily.

In Boston at the meetings of the American Chemical Society and each week in Washington through the clearing house of the U. S. Patent Office, the surge of research progress brings new chemical marvels.

Through a telegraphic survey of the chemical industry by Science Service, word comes from Dr. Gustav Egloff, research director of Universal Oil Products Co., that by the new dehydrogenation process, "ten per cent. of the available supply of natural gas in the United States, estimated at 2,500,000,000,000 cubic feet a year, can be converted into olefins for the production of super motor fuels and other useful and valuable substances."

From Commercial Solvents Corp., supplying chemicals to other chemical companies comes news of the commercial availability of a whole new class of chemical compounds derived through basic research by Prof. Henry B. Hass of Purdue University on the nitration of paraffin hydrocarbons.

"Several hundred derivatives of the nitroparaffins have been prepared in the laboratory," says C. L. Gabriel, manager of the market development division of CSC. "Initial production will cover but a small number of these."

Nitromethane and nitroethane are two of these products, however, which are important now because they can be converted into explosives.

Dr. C. E. K. Mees, research director of Eastman Kodak Co., pictures continual improvement of color photography for home motion pictures "through the production of organic chemicals of complicated structures which aid in sensitizing the film emulsions and in producing colors in the finished pictures."

In the chemical laboratories of Brooklyn's Polytechnic Institute two scientists, Donald F. Othmer and Donald Q. Kern have studied a new, simple way of making the chemical known as thiodiglycol, the starting material for the manufacture of mustard gas, most feared of all war gases which came into service during the World War.

Production of mustard gas during wartime by the German method (discovered in 1886 by V. Meyer) was costly, the Brooklyn scientists told the meeting of the chemists. The advance made by the new process is to speed the reaction of ethylene oxide and foul-smelling hydrogen sulfide. In the gas phase the reaction is slow but after dissolving in thiodiglycol the reaction goes swiftly, with yields amounting to almost the theoretical maximum to be expected.

The significant report of Othmer and Kern indicates the ability to assemble data suitable for manufacturing on a large scale.

Since World War days there have been recurrent rumors, never substantiated, of new and powerful chemical agents in warfare (as the U. S. Chemical Warfare Service chooses to call poison gases). But experts still believe mustard gas outranks all gases known in its wartime utility. A new and easier way of making mustard gas should make possible in case of need the world production of this poison gas far beyond its peak of the last war when at the Armistice 300 tons daily could be produced.

Hydrogen fluoride assumed a new role at the chemists' meeting. It can now serve as a superior catalyst for a host of vital organic chemical reactions. Pennsylvania State College's Prof. J. H. Simons summarized more than three years of research on the amazing ability of anhydrous hydrogen fluoride to act as a passive agent (catalyst) in making compounds like benzene, toluene and other "aromatic" compounds, react faster, easier and with greater yields with acids like acetic, with esters like benzyl acetate and other favored stepping stones by which organic chemists turn sticky black coal tar derivatives into brilliant synthetic dyes, high explosives, valuable drugs and other products.

Hydrogen Fluoride Catalyst

Prof. Simons hailed hydrogen fluoride as a preferred industrial reagent.

Not only can many intricate chemical syntheses be carried out more easily with the hydrogen fluoride catalyst, but reactions never before possible have been achieved, Prof. Simons stated.

"There are reactions that hydrogen fluoride promotes that have not been reported using other reagents," states Prof. Simons. "One of these is a reaction between an aliphatic halide and an olefin. Two examples are . . . the reactions of tertiary butyl chloride with trimethylethylene and with cyclohexene."

While much of the university research in chemistry has been saved for the chemical society's Boston meeting, the great chemical research parade of industry has been sweeping on, with the first hints of progress coming often from the