CHEMISTRY

Vitamin A Synthesized

Kept secret during the war to avoid aiding the enemy, the process seems to promise independence of fish liver oils as source.

➤ VITAMIN A, hitherto obtained from fish liver oils, has now been made synthetically, Prof. Nicholas A. Milas, of the Massachusetts Institute of Technology, announced at a meeting of the American Chemical Society in Cambridge, Mass.

The synthesis was accomplished during the early part of the war but was kept a secret. War interference with the fishing industry caused a shortage of this vitamin, particularly important for growing children and necessary for eye health at all ages. To prevent wastage of the precious supply, the amount of the vitamin in multiple vitamin pills was restricted.

Now it appears that we were becoming independent of fish as a source of supply and need not worry over any future shortage of the natural vitamin.

Germany was also believed suffering from a shortage of this vitamin, in spite of the fact that she had access to some Norwegian fish liver oils. The acute shortage of vitamin A containing fats suffered by Germany and her allies during the first World War has been held responsible for the breakdown in morale that contributed to their defeat in 1918. These considerations led to keeping information about the synthesis of the vitamin secret for the duration.

Before the war, in 1937, one of Germany's leading organic chemists, Richard Kuhn, had announced a synthesis of vitamin A. Attempts by other scientists in Germany and other countries to synthesize the vitamin by his process, however, were entirely unsuccessful.

The M.I.T. workers investigated several processes before they succeeded in making the vitamin in the laboratory. The most successful process involves seven to eight chemical steps in which beta-ionone, ethyl chloroacetate, acetylene, and derivatives of beta-hydroxybutanone-2 are the principal raw materials used. Starting from beta-ionone the vitamin A active product is produced in an overall yield of 10-15%.

The biological potency of the product is only one-tenth to one-thirtieth that of pure vitamin A crystals obtained from natural sources, but is 50 to 100 times greater than that of ordinary cod liver oil.

The synthetic process has not yet been translated from the laboratory to commercial production but some preliminary cooperative work was done along these lines during the war.

Science News Letter, January 19, 1946

FUNGI TEST—Radar and radio equipment, switchboards, transformers and hundreds of other kinds of apparatus which went into the Pacific war theater in huge quantities were tested against attacks from every type of mold common to Pacific areas. Sixteen different kinds of fungi here receive their weekly meal of home-made bread to keep them robust and destructive. Photograph from Westinghouse.

MEDICINE

Alkalis for Poisoning

Victims of wood alcohol poisoning saved from blindness and death by new treatment. Must be given promptly and repeated at hourly intervals.

➤ VICTIMS of poisoning by methyl alcohol, popularly known as wood alcohol and smoke, can be saved from blindness and death by alkali treatment, four Naval medical officers report. (*Journal, American Medical Association,* Jan. 12)

Good results with this treatment in 26 out of 31 cases were achieved by Comdr. W. B. Chew, Comdr. E. H. Berger, Capt. O. A. Brines and Capt. M. J. Capron. The other five died within three hours after being admitted to the hospital in a critically ill state.

One of those saved was unconscious for about 12 hours.

The men had drunk wood alcohol in amounts estimated at from about three ounces to about one pint. Many also had drunk beer ranging in amounts to 21 cans.

Washing out the stomach, giving fluids and purgatives has been the usual treatment. The profound acidosis present has prompted the use by some physicians of alkali treatment which the Navy doctors also found gave good results.

The alkali is injected into the veins in the form of sodium lactate and given by mouth in the form of sodium bicarbonate. If the patient is unconscious, the sodium bicarbonate is given by stomach tube. The treatment must be given promptly and repeated, at about hourly intervals, three or four times until tests show the acidosis has been overcome.

Within a few hours the breathlessness, nausea, cramps and mental symptoms abated. Blurring of vision cleared within 24 hours in many cases. When discharged from the hospital, after about two weeks, all but four of the 26 had as good central vision as before the poisoning. Another two regained apparently normal vision within the next three months.

Science News Letter, January 19, 1946

CHEMISTRY

TDE Deadlier Than DDT For Mosquito Larvae

➤ TDE, a chemical compound related to DDT and sometimes found as an impurity in the commercial product,

proves to be even deadlier in its effects on mosquito larvae, state Dr. C. C. Deonier and H. A. Jones of the U. S. Department of Agriculture. (*Science*, Jan. 4.) They tried the material in several different media of dispersal as both dusts and sprays over the water, and found that its effects were more persistent after a given lapse of time. TDE is a convenience-designation, taken from the initials of the compound's generic name, tetrachloro-diphenylethane.

The experimenters state in conclusion: "These laboratory tests are only preliminary, but TDE shows sufficient toxicity to warrant further study. Although early advice indicated that the compound might be difficult to manufacture, from more recent information it appears that TDE may be manufactured on a large scale."

Science News Letter, January 19, 1946

ELECTRONICS

Coaxial Cable Ready

Will transmit television pictures and sound between Washington and New York. Is one link in 6,000-mile national network planned.

➤ COAXIAL CABLE, now ready for the transmission of television pictures and sound between Washington and New York, is but one link in a national network of over 6,000 miles planned by the Bell System, and will be used both for television and telephone. Regularly scheduled intercity television service on this Washington-New York link will begin soon and will use the cable six nights each week. Coaxial cable transmission seems to be preferred in long-distance television at the present stage of development.

Television can be transmitted through the air by radio waves, but there are practical difficulties that must be met in long-distance transmission. Television images can be sent very short distances over special telephone wires, but not far because electrical losses are too great. The coaxial cable for long-distance television is a low-loss method of transmitting the broad band of frequencies which make up television signals. The probability is that all three methods will be used in interconnected systems.

One difficulty faced in the transmission of television images by radio waves, according to Walter Evans of the Westinghouse Electric Corporation is, that television waves travel in straight lines, and, for all practical purposes, stop at the horizon. This means, he says, that television broadcasts from the highest practicable tower erected on the ground cannot be received much more than 50 miles away.

By use of radio relay stations the television waves can of course be transmitted much farther. These relay towers are spaced about 30 miles apart. Such a television relay system is now under construction for experimental purposes by the Bell System between New York and Boston, and another between Chicago and Milwaukee. The Bell System plans a television network that will consist of interconnected coaxial cable and radio channels.

Because of the difficulty of transmitting television images long distances from towers erected on the earth, the Westinghouse Electric Corporation recently announced plans to test out airborne relay stations in airplanes flying in lazy circles 30,000 feet above sea level. Waves sent out from transmitters in a plane at this height, it was explained, would blanket the earth's surface like a giant ice-cream cone, covering an area 422 miles across.

A coaxial cable, itself lead-covered, contains usually from six to eight conductors. Each is a copper tube about the size of a lead pencil, with a heavy copper wire extending throughout its length and held in its center, out of contact with the tube, by plastic disks. Each tube, with associated equipment, can accommodate a television channel, or 480 telephone channels.

Science News Letter, January 19, 1946

CHEMISTRY

Waste Sulfite Liquor Put to Useful Service

➤ ONE OF INDUSTRY'S worst waste-and-pollution problems, disposal of sulfite liquor from paper and wood-pulp mills, is attacked from a new angle by Richard G. Tyler of Seattle, who has been granted patent 2,392,435 on the process he has worked out. Instead of trying to reduce the volume of the lime sulfite solution directly by evaporation, and thereby running into scale-formation trouble, he puts the spent liquor through a carbonaceous base-exchanger which has previously been treated with a solution of common salt—sea water will do.

The solution comes out as a complex mixture of sodium salts, containing lignin and other residues of the wood. After evaporation this can be burned under the boilers, supplying power. The clinker or "smelt" that is left is rich in commercially valuable sodium salts.

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