CHEMISTRY—MEDICINE

Anti-Blood Clotting Agent Clue to Thrombosis Treatment

Chemical Society Hears Reports of Heavy Nitrogen, Super-Gasolines, Method for Removing Fluorine

PREVENTION of dreaded blood clots, often fatal condition known medically as thrombosis, may now be nearer at hand. This appears from research reported by Dr. Edwin Chargaff of the College of Physicians and Surgeons, Columbia University, at the meeting of the American Chemical Society in Rochester, N. Y.

The mechanism of blood-clotting is one of science's still unsolved mysteries. Hemophilia or bleeders' disease is one result of defect in this mechanism and thrombosis is another.

By combining a small amount of sulfuric acid with a wax-like substance found in the brain, Dr. Chargaff obtained a substance which very markedly checks the clotting of blood, he reported at the meeting of the American Chemical Society. The material is called cerebroside sulfuric acid, and this is the first time it has been made in the laboratory.

Sulfuric acid is also found in heparin, the most powerful anti-blood clotting substance known. It was originally discovered in the liver by Dr. W. H. Howell of the Johns Hopkins University. In purified form, heparin injections have prevented thrombosis formation to a considerable extent in animals, Drs. C. H. Best, Arthur Charles and Campbell Cowan of the University of Toronto recently reported.

Study of the eventual practical application of Dr. Chargaff's latest discovery is now under way.

Heavy Nitrogen

First heavy hydrogen. Then heavy water. Now heavy nitrogen. That is the thumbnail research summary of the work of Prof. Harold C. Urey, Columbia University chemist who has already received the 1934 Nobel Prize in Chemistry for his investigations in the intricate field of chemical isotopes.

Heavy nitrogen, latest chapter in this scientific program, has now been separated in quantities sufficient for chemists to use it as a "tracer" in chemical experiments.

After two years of intensive research Dr. Urey and his colleagues, Dr. John R. Huffman, H. G. Thode and Marvin Fox, have so perfected their apparatus for producing heavy nitrogen that they can produce two-tenths of a gram of the precious heavy isotope of nitrogen every 24 hours. An isotope is a variety of an element which is chemically identical with the usual form but which has a slightly different weight.

In physiology heavy water molecules —composed of oxygen and hydrogen atoms in the form of the heavy hydrogen isotope—have already been used to learn how long the water is retained by the body. English experiments have shown that about 50 per cent. of the water molecules, drunk at any time, may be retained in the body for days.

Similarly the atoms of the new heavy nitrogen isotope can also be used as tracers. At the same meeting investigators from the Columbia University School of Medicine, under the direction of Assistant Prof. Rudolf Schoenheimer, reported that the heavy nitrogen helps to establish the fact that absorption of hippuric acid, or benzoylglycine, is possible directly through the intestinal walls of the body. This knowledge helps answer one question on the little understood matter of the body's chemical disposal of a waste product.

The new heavy isotope of nitrogen has an atomic weight of 15 instead of atomic weight 14 for the normal kind. Only one nitrogen atom in every 263 is of the heavy variety. The original discovery of the heavy nitrogen isotope was made in 1929 by S. M. Naude of the University of Chicago. Thus, it has taken some eight years to attain the present production, even though it may seem, at first glance, to be a very small quantity.

Super-Gasoline

Super-gasolines that four years ago were so rare they cost $30 a gallon will next year be made in a production of over 18,000,000 gallons. The government is purchasing that amount for the Army, Navy and other branches to increase the performance of airplanes in the federal air services by 30 (*Turn to Page 188*)

DR. EMMA P. CARR

CHEMISTRY

Mt. Holyoke Chemist Is First To Win Garvan Medal

FOR HER long continued and intricate investigations in the far ultraviolet wavelengths, Dr. Emma P. Carr, head of the chemistry department at Mt. Holyoke College, will be the first recipient of the Francis P. Garvan gold medal, established to honor outstanding women chemists.

Dean Frank C. Whitmore of Pennsylvania State College and president-elect of the American Chemical Society meeting here made the announcement. Actual presentation of the medal, named in honor of the president of the Chemical Foundation, will not be made until the spring meeting of the Society.

Dr. Carr's spectrographic studies are in the far ultraviolet region of the spectrum, where the ultraviolet shades off into the X-ray region. All the measurements are made in special vacuum spectrographic apparatus which was provided through funds of the National Research Council.

The Rockefeller Foundation granted financial aid which permitted Dr. Carr to study the absorption spectra of what chemists call the unsaturated hydrocarbons.

Her researches have led to important contributions to the knowledge of molecules used by the petroleum chemists.

young thrive best on certain kinds of caterpillars. It may even be necessary to import suitable species of moths and butterflies into a thoroughly-sprayed, caterpillarless land, and keep them in special bird-and-insect preserves.

Just as presidential proclamations now establish new national parks and federal game sanctuaries, the New Deal of 2000 A. D. may be expected to act for the preservation of insects.

"In the year 2000, the President of the United States issues a significant proclamation. In order to provide suitable conditions for native and introduced pollinating insects, the Government claims areas of land at few-mile intervals in rural districts throughout the country. These areas will be maintained as Insect Gardens, under the direction of government entomologists.

Caterpillar Plants

"Milkweed will be grown for larvae of monarch butterflies, plants of the parsley family for black swallowtails, and so on. Woodbine, purslane, and other suitable food will be grown for the larvae of the more important sphinx moths.

"No caterpillars are to be killed in these gardens. If one district becomes overpopulated, the surplus material will be taken to another district where these same insects are not abundant enough.

"Especial attention will be given to introducing solitary wild bees into localities from which they have disappeared. European species, if available, will be purchased to increase the supply. Colonies of native bumblebees will be placed in favorable habitats. European species, if available, will be purchased to increase the supply. The emphasis on solitary bees and bumblebees will be necessary because of frequent epidemics of hive-bee diseases that reduce their usefulness when they are most needed."

Insects for Posterity

It may seem fantastic to think of a world careful of its insects, and taking such means to coddle them. But remember, we utterly exterminated the passenger pigeon, and saved bison and pronghorn just in the nick of time. So while you go on massacring the bad insects, better try to be a little kinder to the good ones. Your grandchildren may want them.

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MEDICINE

Medical Association Offers To Hold Medical Patents

Reversal of Policy Made Necessary to Prevent Unscrupulous Commercial Exploitation, Editor Says

UPSETTING 23 years of policy, the American Medical Association has admitted indirectly that patents on medical discoveries are needed.

Dr. Morris Fishbein, editor of the *Journal of the American Medical Association,* speaking before the American Chemical Society meeting at Rochester, N. Y., advocated the setting up of a non-profit holding corporation to administer patents in the medical and health fields.

The new suggestion of the powerful and conservative A.M.A. includes suitable royalties to the discoverers. This is a distinct change from the 1914 resolution of the A.M.A. which permitted it to accept patents. Under this resolution neither the A.M.A. nor the patentees would receive remuneration for the patents.

In effect, the physicians now recognize that the profit motive in the development of research discoveries has an important function in present day American society.

Under its 1914 resolution, said Dr. Fishbein, the American Medical Association never accepted any medical patents and it did not formulate any plan for the administration and control of patents in the medical field.

The new proposal advanced by the A.M.A. spokesman is a modern compromise with the rigid principles of medical ethics which state distinctly "it is unprofessional to receive remuneration from patents for surgical instruments or medicines."

The new suggestion for the control of medical patents, declared Dr. Fishbein, seems needed because of the diversified methods which university and non-profit research foundation laboratories have been compelled to take in order to protect their discoveries from unscrupulous commercial exploitation.

Dr. Fishbein cited the discovery, patenting and control of insulin, used in treating diabetes, as an example of desirable control of medical discovery. The arguments in the patent field over the production of vitamin D and vitamin D products are illustrative of the troubles that may arise, added Dr. Fishbein in contrast. He continued:

"The sun in the sky should be freely available to all who wish to use it. Yet it has been hinted that there are some concerned with patents on vitamin D who would even inhibit investigators from experimenting with the sun."

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per cent. Bombing planes that now could carry 2,000 pounds of bombs will be enabled to carry 3,000 pounds of their deadly missiles with the new 100 octane number fuels.

To the meeting of the American Chemical Society, Dr. Gustav Egloff of the Universal Oil Products Company reported the potentialities of these new fuels which the chemist is developing.

If the engines of the great China Clipper were designed to use these newest fuels the increased payload possible would be worth $2,000 on each single trip between Alameda and Honolulu, said Dr. Egloff.

Iso-octane is a synthetic fuel that is improved in its burning characteristics over any thing which nature produces. Normal octane, said Dr. Egloff, burns too rapidly in a motor of a modern automobile or airplane, because its eight carbon atoms are strung out in line. During combustion in the cylinder of a motor the flame rushes rapidly down this straight line of atoms and produces the engine knock known so well to motorists.

What the chemists have done with the new iso-octane fuels is to introduce a chemical "maze" through which the flame spreads more slowly, as though bewildered. The maze in reality consists of carbon atoms branching off from the main chain. The slower burning yields less engine knock at higher compression in the cylinders of a motor. And higher compression means more power per gallon of fuel. While this added power is valuable for automobiles it is most vital

to increase the payload of airplanes whether in passengers, freight, or bombs.

Chemical Removes Fluorine

Traces of fluorine compounds, found in drinking water in the Midwest and responsible for the mottled coloring of children's teeth, can be removed by use of a chemical, tri-calcium phosphate, Dr. Howard Adler and George Klein of the Victor Chemical Works revealed. Tri-calcium phosphate, dried to a powder from a watery gelatin, absorbs fluorine compounds readily, Dr. Adler explained. Ten pounds of the substance will remove sufficient fluorine from 560 gallons of water to render the small impurity harmless.

Chemical Halts Rose Pest

Red spider, a pest to the rose fancier and a menace to the professional flower grower, can be controlled effectively by a new derivative of the chemical cyclohexylamine, T. S. Carswell and H. L. Morrill of the Monsanto Chemical Company told the Society.

Cyclohexylamine, which has been known in the laboratory since 1893, is now being produced commercially in the United States, they reported in a survey of the uses of the substance.

Destructive influence of the pest, which attacks a wide variety of hothouse plants as well as roses, is particularly felt in the greenhouse, where a single bench of roses frequently represents an investment of $20,000.

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Great Salt Lake in Utah is nine and a half feet lower in elevation now than it was in 1924.

BOTANY

NATURE RAMBLINGS
by Frank Thone

Names From the Armory

ODD, how many names for use in their peaceful trade botanists have drawn from warlike armories!

Leaves especially seem to have struck the military streak in the scientific imagination. There are hastate leaves, from the Latin hasta, a spear; lanceolate leaves, obviously from the word lance; sagittate leaves, from sagitta, an arrow; gladiate leaves, from the word for a sword; peltate, from the name for a shield; umbonate, from the umbo or boss in the middle of a shield.

Other shapes in botany, applied more often perhaps to shapes of flowers and fruits, are pileate, from pilum, a javelin; galeate, meaning helmet-shaped; clavate, from the term for a club; arcuate, meaning bow-shaped or bow-like.

Naval terms have been drafted into botanical service, too: the parts of an orthodox flower of the pea or bean family are known as banner, wings, and keel. And naviculate, shaped like a little boat, is applied to a certain type of seed-pod.

Some of the commonest terms of plant anatomy are military borrowings. We speak of leaves as arranged in ranks on branches; certain small outgrowths that protect other plant organs are called scutella, or little shields. Many flowers have spurs, and irises at least carry standards. There are guard-cells on the surfaces of leaves, palisade cells beneath.

Common and Latin names alike give Army names to whole plants: gladiolus means a little sword, there is a mushroom known as clavaria or club-fungus, science and common speech agree on the arrowiness of sagittaria or arrowleaf. And there are spearmint, arrowroot, devil's club, knife-bean, shield-fern, club-moss, and blades of grass.

It is interesting to note, however, that almost all of these terms date from ancient times, before the invention of firearms. Only a few plants, and those from lands unknown in classic days, bear such names as cannonball tree and Spanish bayonets. Curious, too, that the military names used are all of hand weapons; catapult and ballista and batteringram seem to have been forgotten.

One wonders what might have come to pass if there had been any women botanists in the old days when names were becoming established. Would we have had fewer names from the armory and more from the household, like fusiform or spindle-shaped, plumose or feathery?

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ENGINEERING

Engineers Invent New Word; A "Vodas" Distorts Voice

IF ANY READERS are now going through the process of learning one new word a day to increase their vocabulary, the word "vodas" is recommended. It won't be found in any dictionary now in existence and is as new as today's newspaper.

To save playing the old game of asking "animal, vegetable or mineral?" one should hasten to add that vodas is an instrument through which the electrical impulses of your voice must pass when, and if, you next talk by trans-Atlantic radio telephone.

The vodas does many things to your voice, including the creation of an artificial stammer. And it can turn your normal voice volume into a roar.

Vodas is a newly coined word composed of the first letter of each word in the following phrase: "voice-operated device anti-singing." A vodas, S. B. Wright