

CHEMISTRY

Chemistry Aids Health

Advances in chemistry ranging from clues to the causes of rheumatoid arthritis to new stimulants hold the promise to better health.

➤ A NUMBER of substances have been found in the blood which may offer a clue to the mysteries of rheumatoid arthritis.

Blood samples taken from some of the 4,000,000 Americans afflicted with the disease have revealed that the rheumatoid factor is composed of several closely related proteins, Dr. Ralph Heimer reported to the American Chemical Society meeting in Chicago.

Study of these rheumatoid factor proteins "might offer a clue to the unknown cause of the disease," Dr. Heimer, a biochemist at the Hospital for Special Surgery, New York, said.

At least three different proteins were found, all in extremely small amounts. As little as one seventy-thousandth of the total circulating serum protein in arthritic blood was found to be made up of these special proteins.

The newly identified proteins resemble some of the unusual proteins associated with other diseases, such as hepatitis, syphilis and certain kind of anemias. They also seem related structurally to the common antibodies found in the blood.

It seems, Dr. Heimer pointed out, that the rheumatoid factor proteins may be auto-immune bodies. These are substances manufactured by the individual in defense against his own body materials which have been altered through disease.

"The response by the body to its own products, while also perhaps a protective device, proves under many circumstances to be disadvantageous," the scientist said. Auto-immune bodies apparently play a role in some diseases related to rheumatoid arthritis.

New sensitive isolation techniques, one protein was detected although only one three-billionth of an ounce was present, are expected to aid greatly studies of rheumatoid arthritis.

Olga M. Federico and Dr. Richard H. Freyberg, also of the Hospital for Special Surgery, were co-authors with Dr. Heimer of the report.

Germ Detection

➤ A CHEMICAL means of detecting deadly germ warfare agents has been developed.

The same technique can also be used to detect pollen in the air, Dr. Carl O. Thomas, Bell Telephone Laboratories, Murray Hill, N. J. told scientists at the meeting.

The germ warfare agents would reveal themselves to Army chemists only indirectly as hydrogen cyanide. Germs, which are composed of protein, form hydrogen cyanide when heated in glass tubes at 600

degrees to 900 degrees Fahrenheit, Dr. Thomas explained.

The cyanide gas would be detected by normal chemical means.

He emphasized that the method, developed several years ago under an Army contract at Southern Research Institute, Birmingham, Ala., and only recently declassified, is not necessarily the technique that actually would be used for protection against germ warfare.

Since many other protein substances are normally present in the air, he pointed out, technicians using the new technique will have to maintain a background count, and then watch for sudden increases in atmospheric protein count which could be attributable to germ warfare agents.

In experiments, Dr. Thomas reported, "... it was possible ... to detect a few millionths of an ounce per cubic foot of air. Thus the method provides a very simple, sensitive, and rapid technique for indicating the presence of bacteriological warfare agents in the air."

Since pollen is protein, it also can be detected by the method, he said.

Promising Stimulants

➤ CHEMICALS related to the rocket fuel, hydrazine, have shown powerful stimulating action against depression and fatigue in laboratory animals.

Extensive clinical trials of the most promising member of the group, 1-phenyl-2-propyl hydrazine, for treatment of the depressed state in human beings are underway. The chemical's code name is JB-516, Dr. John H. Biel, chief of the chemistry division of Lakeside Laboratories, Milwaukee, told the American Chemical Society.

The new agents act by directly stimulating the central nervous system and by blocking the brain enzyme that destroys adrenalin and other activating hormones. Enzymes are naturally occurring chemicals that control the speed of body processes.

JB-516 has been shown in laboratory tests to inhibit the brain enzyme for an entire week.

One shortcoming of drugs now used to treat depression in humans is that the chemicals are rapidly destroyed by the body's enzyme system. They also tend to lose their effects on repeated administration, to have undesirable depressing after-effects, to decrease appetite, and to increase blood pressure and pulse rate, Dr. Biel said.

The new hydrazine-related chemicals produce a prolonged effect with no following period of depression, tend to lower blood pressure and increase appetite.

Dr. Alexander Drukker, senior research

chemist of Lakeside Laboratories, was co-author of the report.

Beans Contain Vitamin C

➤ BRITISH "limeys" or sailors, might have been known as "beanies" instead, if the Royal Navy had known years ago something that was revealed to chemists.

Instead of avoiding scurvy by sucking limes to obtain vitamin C, they could have obtained the vitamin by eating sprouted beans, Dr. Albert A. Dietz of the Toledo (Ohio) Hospital Institute of Medical Research reported.

The biochemist said many grain-type animal feeds are considerably improved nutritionally by allowing them to germinate, or sprout, before using them.

He also questioned whether vitamins, proteins or enzymes developed in the foods during sprouting would be destroyed by refining the cereal foods for human consumption.

He reported that laboratory studies on animals have shown sprouted feeds to be more nutritional than the same grains, but not germinated.

Oats and barley showed the greatest effects from being allowed to sprout before being used as feeds. Germination had smaller effects on corn and wheat, and frequently the sprouted grain did not support animal nutrition as well as ungerminated ones.

Dr. Dietz emphasized that his studies were based only on one method of testing nutritional values, and he does not necessarily advocate only germinated cereal as a diet.

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ENTOMOLOGIST

Parasite Fly May Mean Control of Grasshopper

➤ A FLY that can take the "hop" out of a grasshopper may mean control of this pest is possible without using insecticides.

In a limited area in central California, the fly has destroyed so many grasshoppers that it has virtually wiped them out, W. W. Middlekauff, entomologist at the University of California College of Agriculture in Berkeley, reported.

The female fly deposits a larva in the grasshopper's leg muscle through a fang-like tube on her lower abdomen. The larva eats its way through the grasshopper's body until, in about six days, it emerges leaving its victim hollowed out and dead. The half-inch larva transforms into an adult fly in four more days.

Although many wasps and bees have adapted themselves as parasites, Mr. Middlekauff pointed out that it is rare among this group of flies. Some flies, such as the screwfly, deposit their eggs in open wounds but few will attack healthy living animals or insects.

The scientist plans to investigate possibilities of exporting the fly to other parts of the world where grasshoppers and locusts are a serious agricultural problem.

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