

MEDICINE

ACS Serum Explained

It is not a cure for cancer, though it does relieve pain when pain is outstanding symptom. Life-lengthening and other claims due to confusion.

By JANE STAFFORD

► THE ACS SERUM developed by a Soviet scientist has now been given to some 3,500 patients in the United States. The exact figure cannot be given because the final count has not yet been made.

This is the serum you may have read or heard popular accounts of as being able to lengthen human life to 150 years and to cure or prevent a host of diseases such as cancer, arthritis, Hodgkin's disease, infections and mental disease.

ACS is not a cure for cancer. That much can be stated unequivocally, I was told by Dr. Harry Goldblatt, of Western Reserve University School of Medicine, in the course of a search for facts from American scientists who have been studying the serum.

Dr. Goldblatt has prepared the serum and because of "premature publicity and the great demand for it from patients," he has given it to physicians in clinics, hospitals and private practice instead of limiting its use to the relatively few patients he could treat and follow himself. The physicians who were supplied the serum have been sending in their reports and Dr. Goldblatt is now studying them preparatory to publishing the results in a scientific journal.

Besides the fact that the serum does not cure cancer, Dr. Goldblatt has so far found one other fact from the reports he is studying. This is that the serum relieves pain in some cases of cancer when pain is the outstanding symptom and has not been relieved by anything else. The pain, however, is the only thing affected. The patients die just the same.

The hope that ACS would cure or prevent cancer and other diseases and lengthen human life seems to have arisen through confusion over the original reports on the subject. Prof. Alexander A. Bogomolets, director of the Institute of Experimental Biology and Pathology, moved from Kief to Ufa during the war, developed the serum which has the full scientific name of anti-reticular cytotoxic serum. He made it by inoculating horses with an extract of the spleen and bone

marrow of human cadavers.

Prof. Bogomolets long had been interested in problems of longevity. He believed that the human life span should be 125 to 150 years. The life span of other animals is five to six times longer than the period of their maturation, so why should not humans live five to six times longer than the period it takes for them to reach maturity? is the way he reasoned.

Studying human physiology, he came to the view that the physiologic system of the connective tissue is the arena in which disease processes develop. Connective tissue, as its name implies, binds together and supports various structures of the body. The layman recognizes connective tissue in bones and cartilage but it is found in many other structures. According to the modern view, it is not merely a skeleton or framework for body structures but has other functions as well.

In this arena of connective tissue is fought the battle between disease germs and the cells of the body that try to devour the invading germs. The cells that engage in the fight make up another system of the body, called the reticulo-endothelial system. They are found in various parts of the body but are especially abundant in the liver and spleen.

Keeping the system which takes part in the fight to protect the body against disease and injury at a high level of activity is, in Prof. Bogomolets' view, one of the most important problems in treating disease. His anti-reticular cytotoxic serum was designed for this purpose of stimulating the reactivity of this system.

Believing the system fundamental for protection of the body against assault by germs or other disease-causing agents, Prof. Bogomolets believed his stimulating serum might prove effective against a variety of diseases including some that come as the body ages. It might therefore protect against premature death.

This was presented by Prof. Bogomolets as theory, together with the facts of how the serum was prepared and a report that in minute doses the serum stimulated the reticulo-endothelial system while in large doses it had cytotoxic, or cell poisoning, effects on the system.



NATURE'S ARTISTRY—The ostrich fern, uncoiling from the soil in the spring of the year, presents one of nature's most beautiful designs. When one looks at the graceful coil of the frond of a fern, it is very easy to imagine that some early violin maker in fashioning the shape of the scroll of his instrument must have been a keen observer of the artistry of nature. Photograph by George A. Smith, Quarryville, Pa.

Unfortunately, Prof. Bogomolets' theory seems to have been reported by others as an accomplished fact. He himself did not claim that the serum had cured cancer or lengthened life. In a report I saw, he wrote that he thought it could do this and perhaps much more. But "could," in the sense of "might be able," is not the same as "does" or "has done."

In this same report it was stated that all work in his laboratory had been directed toward producing enough of the serum to meet the demands of the battlefield where Soviet physicians and surgeons found the serum useful in stimulating wound healing and the union of fractured bones.

Other American scientists besides Dr. Goldblatt have been studying the ACS serum. At the University of Utah School of Medicine Drs. Mark Nickerson, Thomas Burns and Arnold M. Cooper made a serum by injecting rabbits with rat spleen and bone marrow. They then tested its effect in stimulating wound healing.

Up to the present time, skin cuts and broken bones did not heal any faster in

animals given the serum than in those without it. However, these scientists do not think their results disprove the stimulating effects of the serum. The reticulo-endothelial system of a healthy animal is probably working at its maximum anyway, Dr. Nickerson pointed out to me, so it is not surprising if it cannot be stimulated further. Tests on animals weakened by chronic infection might show a different result.

At the University of Texas at Galveston, Dr. Charles M. Pomerat and asso-

ciates, Drs. Ludwik Anigstein and Edward H. Frieden, have studied the effect of ACS on cells growing outside the body as well as in the body and have made chemical studies in a search for the chemical nature of the active substance in the serum.

In Los Angeles Dr. Reuben Strauss has found that broken bones produced experimentally in rabbits form stronger, bigger calluses, which means they knit better, when ACS is given to the rabbits.

Science News Letter, April 27, 1946

"A final mention must be made of the work on the dissipation of fog on landing fields. The problem of landing a plane under conditions of low visibility is of course ultimately to be solved by radar, but this problem was a very serious one in World War II. No simple economical solution was reached on this problem. Air conditioning the atmosphere is a job whose magnitude can be realized if one remembers that one cubic kilometer of air weighs 1,000,000 tons."

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Cedar paper containing DDT has been developed as a lining for clothes closets and storage chests to protect against moths and other insects.

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MEDICINE-CHEMISTRY

Medical Gas Masks

War research on toxic smokes should bring protection against flu, pneumonic plague, hay fever. Smokeless, dustless homes foreseen.

► A FILTER, like those in modern gas masks, to protect hay feverites from pollens; another such filter for protection against influenza, pneumonic plague and other air-borne diseases; homes free of smoke and dust—these benefits should come from war research on toxic smokes, or, as the layman would call them, poison gases, Dr. W. H. Rodebush, of the University of Illinois, declared at the meeting of the National Academy of Sciences.

"The modern gas mask," he declared, "is a practically perfect defense against poison gases and smokes which act on the nose, throat and lungs.

"It is without question due to this protection that chemical warfare was not used in World War II," he continued.

World War I gas masks stopped poison gas with a dense bed of fine charcoal particles but the charcoal can not stop smoke. That, Dr. Rodebush explained, is why the blue cross shell became one of the most dreaded and effective weapons used by the Germans. It was filled with a sneeze gas in the form of a smoke. Its particles went right through the charcoal and caused intense irritation of the nose.

Several types of filters which were very effective in removing smoke without at the same time making it more difficult to breathe through the gas mask were developed by the aerosol section of the National Defense Research Committee, Dr. Rodebush reported.

"It is an interesting fact," he said "that most of the very toxic substances which have been suggested for use in future wars are aerosols and, insofar as they depend upon penetration of the respiratory tract for effect, the filter is an ade-

quate protection.

"The principles of filtration which have been studied are likely to prove of great use in civilian life. It should be possible, for example, at small cost to remove all traces of smoke and dust from the air in our homes, thus enormously simplifying the problems of housecleaning and greatly increasing the comfort of breathing for the dwellers therein, particularly in our large cities where so much inconvenience and discomfort is caused by the smoke-laden air.

"It would be neglecting an important part of the Aerosol Section work not to mention the insecticide aerosols, such as DDT. It is an interesting fact that the most efficient insecticides are in the form of aerosols. The reason for this is clear on a little thought. A certain minimum dosage is required to kill the insect. If the insecticide is dispersed in droplets of the proper size in a cloud the insect cannot fly through the cloud without encountering one or more of the particles which are adsorbed through the body surface and prove fatal.

"The aerosol cloud behaves as a fine meshed window screen with this difference. In the screen the meshes must be smaller than the insect's body, but in the cloud one can easily make a statistically exact calculation of the size and dispersion of the cloud so that only a negligible percentage of the insects can fly through the cloud without coming in contact with enough of the droplets to give a toxic dose.

"It is, of course, possible to use a toxic gas to kill insects but it turns out that the gas concentrations required are far greater than are concentrations of aerosols.