

Bacteriophage Probably Not Organism

Medicine

Discoveries in Medical Science Revealed at Meetings

A SYSTEMATIC study of the properties of bacteriophage failed to substantiate its living nature," Dr. J. Bronfenbrenner, professor of bacteriology at the Washington University School of Medicine, stated at one of the meetings in Des Moines. The evidence seems to indicate that the bacteriophage is an inanimate chemical product of bacterial metabolism, having no cell-dissolving properties of its own, Dr. Bronfenbrenner said.

Bacteriophage has been hailed as a most potent germ-killer, being made itself from germs, but ever since its discovery by Dr. F. d'Herelle it has been a subject of scientific controversy.

"It seems to exhibit a stimulating effect on homologous or closely related bacterial species," Dr. Bronfenbrenner said. "As a result, the rate of intracellular metabolism is abnormally increased with a consequent increase in osmotic pressure within the cell, and if water is available in the surrounding medium, bacteria take it up, swell and finally burst."

The activity of the phage in suppressing the effects on animal tissue of a definite germ without harming the tissue was compared with activity of certain chemicals. The phage was active at a much wider range of dilutions than any of the five chemicals, mercuric chloride, phenol, formalin, tincture of iodine and chloramine, John E. Walker of the research laboratories of E. R. Squibb and Sons reported. The phage was active at dilutions ranging from full strength to a dilution of 1 to 512, while the nearest chemical, mercuric chloride, could only be diluted to one-sixteenth of the strength causing tissue destruction and still be active.

SEARCH for sources of ergosterol, from which vitamin D may be obtained, has led scientists to examination of certain micro-organisms. However, the search so far has not met with success. Non-disease-producing cultures of the tuberculosis organism did not contain any ergosterol when examined by Paul S. Prickett, C. N. Massengale and Warren M. Cox, Jr., of the research laboratories of Mead Johnson and Co.

On the other hand, the cultures of the organisms grew equally well when both activated and unactivated ergosterol had been added to them. The

activated ergosterol used in the experiment had a potency 250,000 times that of cod liver oil. This would seem to indicate that activated ergosterol has no germ-killing power, although it is a potent substance which can prevent and cure rickets.

Since ergosterol is a sterol and closely allied to the lipid fraction of a material, the possibility of the tubercle organism, which contains about 50 per cent. lipid fraction, being a source of ergosterol led to its examination, the bacteriologists explained.

BECAUSE of the number of animal diseases which may be transmitted to man, veterinary medicine is a necessary factor in the care of the public health. Four men who made outstanding contributions to our knowledge of disease, Jenner, Pasteur, Koch and Theobald Smith, are claimed by the veterinary profession because all of them were interested in animal diseases. So Pierre A. Fish of the New York State Veterinary College told the medical science section.

Tuberculosis, undulant fever, and tularemia are prominent diseases which are transmitted from animals to man, others being anthrax, glanders, foot and mouth disease, cow pox, rabies, actinomycosis, infectious jaundice, rat-bite fever and bubonic plague. For the control of these diseases public health officers and veterinarians must work together. Veterinarians contributed largely to the health of the army during the world war by careful inspection of all meat, milk and their products before consumption, Dr. Fish pointed out.

The importance of continued study of the parasites of man and the lower animals was emphasized by Dr. Maurice C. Hall of the U. S. Bureau of Animal Industry. Parasites may be transferred from one host to another, as from wild to domestic animals and from animals to man, and also in the reverse direction. The parasite in these cases seems able to adapt itself easily to the new host, but the host generally is not so adaptable and as a result shows evidence of hostility to the parasite which we recognize as a disease-picture. Veterinary parasitology is daily becoming of greater importance to the livestock industry, while human parasitology is

still of major importance in the tropics, Dr. Hall said.

"The efficient research worker in human medicine must be prepared to carry his investigations, if necessary, into the cow stable, hog pen, or hen house," Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry, observed in his address before the same section, in which he discussed the menace of animal diseases to the human family.

"Similarly, investigators of such animal diseases as tuberculosis, milk sickness, rabies and abortion disease find that owners of affected animals are often most concerned about the human health phase of these maladies," Dr. Mohler said. "It is plain that the relation between animal diseases and public health not only is intimately close, but also that the study of livestock problems and sciences dealing with them contribute in a surprising degree to public health and welfare," he concluded.

STRANGE secrets of human diseases are being revealed by studies on the comparative reactions of various drugs and poisons on animal protoplasm on the one hand, and on plant protoplasm on the other.

What is one man's poison is another man's meat, might almost be said of plants and animals, Dr. David I. Macht of Baltimore found, for substances which had a toxic effect on living animal tissues did not affect living plant tissues unfavorably at all, and vice versa.

Making use of this phenomenon, Dr. Macht has found that human blood serum in certain diseases contains substances toxic to the seedlings of a certain species of plant. Such a toxin is present in the grave skin disease, pemphigus, Dr. Macht and Dr. Isaac Pels, a skin specialist of Baltimore, found.

In a similar study, Dr. Macht found a toxic substance in the blood of leprosy patients, he reported. Studies of the blood sera of treated and untreated leprosy patients, as well as laboratory studies of toxic sera with and without chaulmoogra oil, demonstrated that in this substance there is a real chemotherapeutic antagonist for the leprosy serum, which explains the excellent results obtained in that disease by field workers using the chaulmoogra oil treatment.

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