

BACTERIOLOGY

Germs Lose and Gain Visibility By Changing Their Diet

Discovery, Hailed as Greatest Since Pasteur, Makes Many Disease Germs Visible For First Time

GIVING germs human proteins to eat is the key to the revolutionary experiments by which Prof. Arthur I. Kendall of Northwestern University Medical School has made invisible germs visible and caused visible ones to vanish into filterable viruses.

This work, hailed as the greatest stride that bacteriology has taken since the days of Pasteur, indicates that many, possibly all, of the germs we know can change from visible to invisible and back again, according to what they feed on.

Feed on Proteins

It has hitherto been impossible to cultivate the invisible germs of such diseases as influenza, smallpox and measles outside living bodies. Prof. Kendall believed this to be due to the fact that all laboratory workers offered them the wrong kind of food. All traditional germ diets were made of such things as beef tea, gelatin, etc., containing the decomposition or breakdown products of proteins. But in human and animal bodies, natural prey of disease-causing germs, there are almost none of these; germs naturally feed on the pure proteins themselves.

Prof. Kendall undertook to get a high-protein ration for his germs. He took pieces of small intestine, human, dog, pig or rabbit, and after treating them chemically to remove the breakdown products, made a culture fluid with what was left. Planted in this, blood from human "flu" patients caused the fluid to become cloudy. A few drops of this cloudy fluid injected into a rabbit's vein gave the animal all the typical symptoms of the "flu." Transferred from this "K medium," as Prof. Kendall calls his fluid, to the old-fashioned germ foods, the germless fluid soon developed thriving colonies of tiny round germs. These appear to be the visible form of the elusive and long sought influenza germ.

Having induced one invisible germ to come out and become visible, Prof. Kendall tried his hand with others. He also took germs that have hitherto been

known only in their microscopically visible form, on old-fashioned culture media, and grew them in his new, high protein cultures. Every one of them turned from visible into invisible form. He filtered the invisible form germs through a porcelain filter so fine that some organic molecules cannot pass through it. He took the fluid that came through and planted it on the old-fashioned germ food again. Colonies of visible germs appeared out of the invisible. He could repeat this process as often as he liked, getting visible germs out of visible virus filtrates, and making the visible forms change back again by planting them in his new form food.

The following germs he lists as having been "put through their paces" from visibility to invisibility and back again: infantile paralysis streptococcus, scarlet fever streptococcus, one



PROF. ARTHUR I. KENDALL

His work means that some of the most menacing diseases may come within man's control.

form of paratyphoid bacillus, typhoid bacillus, the staphylococcus that causes boils, and the crooked germ that the late Dr. Hideyo Noguchi found in yellow fever patients, as well as the little round germ Prof. Kendall himself found in his influenza cultures. He concludes that possibly all bacteria lead this Dr. Jekyll and Mr. Hyde existence.

A sensational by-product of this research is an insight into the nature of the bacteriophage, the mysterious filter-passing something that kills germs as germs kill us. By planting (*Turn page*)

OCEANOGRAPHY

Strange Whirlpool Believed To be Only Play of Tides

THE STRANGE whirlpool reported off Cape Cod was probably not a whirlpool at all but merely the everyday movement of currents which rip and surge over the shoal areas of George's Bank. This is the opinion voiced to Science Service by Commander G. T. Rude, chief of the division of hydrography and topography of the U. S. Coast and Geodetic Survey. Commander Rude has just returned from a two-weeks inspection tour of the four Survey vessels now engaged in the first complete charting of George's Bank.

"Currents passing from ocean depths over shallow areas must necessarily speed up considerably," said Commander Rude in explaining the occurrence, "and the fact that the water sometimes rises up above the surface in 'tide-rips'

may account for the idea of 'whirlpools'".

Commander Rude expressed the belief that such statements as Captain W. E. Parker, of the Coast Survey ship, Hydrographer, who is said to have described the whirlpool, made to the newspapers had been misconstrued.

Commander Rude also said that observation of the "whirlpool" was made at the time of the spring tides when the new moon gives the ocean currents forty per cent. more strength than when the moon is at the quarter. "Thus," he pointed out, "a current of three or four knots moving where the depth is not more than thirty or forty feet is powerful enough to be felt on the side of a Survey vessel but would not, of course, hinder its head-on progress or jeopardize its safety."

Science News Letter, August 1, 1931