

BACTERIOLOGY-MICROSCOPY

Filterable Germ Forms Seen With New Super-Microscope

Device Using Quartz Optical Parts Makes Possible First View of Organisms Rendered Filterable by K Medium

USING the new "super-microscope" invented by Dr. Royal Raymond Rife of San Diego, Dr. Arthur Isaac Kendall of Northwestern University Medical School has seen for the first time the exceedingly minute moving bodies that apparently carry the life of bacteria when these are induced to "dissolve" into a form that will pass through the pores of the finest porcelain filter and still remain alive and able to resume their microscopically visible bodies upon suitable treatment.

The work was done at the Pasadena Hospital, and will be reported in the official publication of the California Medical Association, *California and Western Medicine*.

The material used by Dr. Kendall was a culture of the typhoid bacillus, ordinarily a fairly large germ, easily visible under the higher-powered lenses of a compound microscope. By feeding it on his recently-evolved "K medium," which apparently has the power of causing all visible bacteria to pass over into an invisible, filterable phase, Dr. Kendall induced the bacilli in his cultures to go through this change. Under the highest power of the ordinary microscope, he could see nothing moving in the fluid, except a swarm of rather active little granules that were visible only as tiny motile points.

Small, Motile, Turquoise-Blue

Examined with the Rife microscope, however, these points became plainly visible as small, oval, actively moving bodies, turquoise-blue in color. These appeared in all the cultures, and could be transferred from one culture to another through the fine-pored filters; so Dr. Kendall considers them to be the actual filterable forms of the typhoid bacillus.

He put them to another, more definitely crucial test. Reasoning that since they were all that were to be found in "K medium" cultures of more than eighteen hours' growth, he might find them in an intermediate state in younger cultures, he tried examining samples from cultures exactly eighteen hours old.

In these he found both full-sized bacilli still unchanged, and his small, turquoise-blue bodies, and in addition there were peculiarly altered bacilli within whose substances the turquoise-blue bodies could be seen. These he holds to be bacilli caught in the act of changing from the filterable to the non-filterable phase.

This visual demonstration of the hitherto invisible, living and moving particles of the filterable phase of a bacillus is hailed editorially by *California and Western Medicine*. Of Dr. Rife's microscope the editorial says:

"Whereas our present microscopes magnify from one to two thousand diameters, in this new microscope we have an instrument for which a magnification as high as seventeen thousand diameters is claimed. This is certainly a long stride from the initial efforts of Van Leuwenhoek, whose simple instrument may be said to have laid the foundation for the science of bacteriology which later came into being; and by means of which science much of the world's progress in man's conquest of

the infective and other diseases has been made possible."

In the forthcoming article only meager details of the new microscope itself are given. It is made known, however, that all the optical parts are of quartz instead of the usual glass, that attachments make possible spectroscopic examinations and motion pictures of the material under the lens, and that magnifications up to seventeen thousand diameters are possible. The work on Dr. Kendall's filterable typhoid germs was done at a magnification of five thousand diameters.

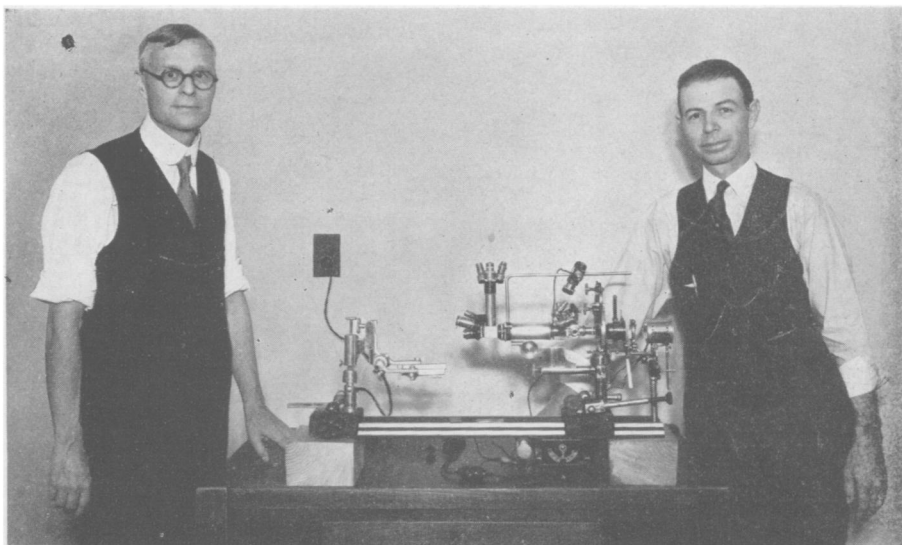
The light used with Dr. Rife's microscope is polarized, that is, it is passed through crystals that stop all rays except those vibrating in one particular plane. By means of a double reflecting prism built into the instrument, it is possible to turn this plane of vibration in any desired direction, controlling the illumination of the minute objects in the field very exactly. Further details regarding the mechanical construction and the optics of the sensational new instrument are promised soon.

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ARCHAEOLOGY

Grand Stairway Unearthed In Ruins of Monte Alban

DIGGING in the principal plaza of the old ruined city of Monte Alban, a Mexican archaeologist, Alfonso Caso of the Mexican National Museum, has unearthed a grand stairway 130 feet in width. Monte Alban was a city



TO 17,000 DIAMETERS

Magnifications as great as this are claimed for the new Rife microscope, which made visible the hitherto unseen living particles in the filterable stage of the typhoid bacillus. At left, Dr. Arthur I. Kendall, Northwestern University Medical School; right, Dr. Royal Raymond Rife of San Diego, who built the instrument.