



CHEMISTRY IN GERMS

The electron microscope, by enabling scientists to shoot this 10,000-times-life-size picture of the diphtheria bacillus (left), showed how the tiny germ changes a tellurium salt into metallic tellurium, seen in crystals (the dark rods) at the end of the germ. At 30,000 magnification (right), the tellurium crystals can be seen pushing their way through the germ into the surrounding space.

ASTRONOMY

Stars Change Shape While Revolving Around Companions

Tidal Pull of Each Star Stretches the Other Into Egg Shape as They Swing About in Cosmic Waltz

EGG-SHAPED stars, which sometimes are more stretched out, at other times more nearly spherical, were described by Dr. Theodore E. Sterne, of the Harvard College Observatory, before the meeting of the American Astronomical Society in Philadelphia.

These are stars known as eclipsing binaries. Such a system consists of two separate bodies, revolving around each other in a sort of cosmic waltz. When one comes between us and the other partner, the total light reaching us is reduced. No telescope is powerful enough to show the two separately, but their presence can be deduced from the way the light varies, and from analysis of the light with the spectroscope.

The tidal pull of each star on the other stretches it, so they are never ex-

actly spherical, said Dr. Sterne. As they rotate, they present varying amounts of their surface to observers, depending on whether we see the egg on end or sideways. This causes additional variation of light, in addition to the eclipses.

Until lately, it has been assumed that the stars, though not spherical, remained constant while they performed their dance. This is not the case, said Dr. Sterne, for his calculations, which were made independently by an English mathematical astronomer, show that if, as is often the case, the paths are not perfectly circular, the stars will be stretched most when they are closest. When farthest, they will be more nearly round. This variation in shape must be considered in interpreting the changes of light, he stated.

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BACTERIOLOGY

Probe Secrets of Germs With Electron Microscope

NEW FACTS about the diphtheria bacillus, which that germ has hitherto kept secret from man's prying microscopes, have been discovered by Dr. Harry E. Morton, University of Pennsylvania School of Medicine, and Dr. Thomas F. Anderson, research laboratories of the Radio Corporation of America.

The electron microscope, which uses particles of electricity instead of light and magnetic fields instead of lenses to let scientists see objects one-fiftieth the size of anything heretofore visible, enabled Drs. Morton and Anderson to record the location of chemical reactions within the tiny diphtheria germ.

Crystals of tellurium metal are formed from tellurite salts within the diphtheria bacillus, they discovered in electron microscope studies reported to the Society of American Bacteriologists in St. Louis.

The fact that the diphtheria bacillus and other microorganisms could reduce tellurite salts to black tellurium metal has been known since 1900, but in the case of the diphtheria bacillus, it was explained, it was not known where the formation of the metal occurred.

Crystals of tellurium are not only contained within many of the diphtheria cells, the electron microscope pictures showed, but in some cases the crystals perforate the cells and extend into the surrounding space.

"Occasionally," Dr. Morton said, "when the crystal projects through the cell the outline of the cell extends along the edge of the crystal a short distance suggesting that the cell 'membrane' was perforated from the inside outward. The tellurite crystals disappear upon treatment with appropriate chemicals."

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● RADIO

W. H. Cameron, managing director of the National Safety Council, will tell you "How YOU Can Help Reduce Accidents in 1941" as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Jan. 16, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.