

ASTRONOMY

# Costly Grinding of Telescope Disk Replaced by New Method

## By Depositing Aluminum Just Where It is Wanted Surface Can Be Shaped in Any Desired Manner

FIVE years of time and tens of thousands of dollars are still to be spent in grinding the great 200-inch disk of glass, eventually to be the mirror of California Institute of Technology's giant telescope. But this may be the last time astronomers will ever have to go through such a tedious, intricate and costly procedure.

Dr. John Strong of the California Institute of Technology, inventor of the aluminum coatings for telescope mirrors to replace the more usual silver films, reported to the American Physical Society experiments on controlled deposition of the aluminum surface to form the parabolic concavity desired for astronomical telescope mirrors.

The evaporation deposition of aluminum technique of Dr. Strong and Dr. E. Gaviola (See *SNL*, July 6) starts with a spherical mirror. Aluminum is evaporated on to the mirror surface with a series of concentric zone screens in place. When sufficient metal has been applied to the exposed areas a screen is removed and more metal applied. Working in this fashion the whole surface of the spherical mirror is coated with aluminum having different thicknesses. Eventually the spherical surface becomes a paraboloid.

The years of grinding to be performed on the great 200-inch disk of the Caltech telescope will be spent in achieving the same parabolic form of surface.

Reporting definite accomplishments, Dr. Strong told of a 12-inch diameter spherical mirror which has been turned into a parabolic mirror on repeated occasions. The finished surface, he pointed out, was accurate to one-twentieth of a wavelength of light. Theoretically a mirror surface may be defective to one quarter of a wavelength of light and yet be usable, so that Dr. Strong's accuracy yields what might be called an optical "factor of safety" of some five times.

Physicists were equally glad to hear of another test in which a spherical mirror more than five inches in diameter was parabolized with its optical

axis outside the edge of the mirror. Such mirrors are in demand for use in spectrographs.

Also successfully accomplished was the correcting of a defective parabolic mirror by putting the aluminum coating on in the right places.

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MEDICINE

## Poison May be Factor in Causing Pernicious Anemia

WHILE liver extract has conquered pernicious anemia as a fatal disease, new research by Drs. G. E. Wakerlin and H. D. Bruner, of the University of Louisville School of Medicine, may hold the promise of improved understanding of its cause.

Drs. Wakerlin and Bruner believe that the old idea of a poison factor in the disease's cause may have been right. They give research findings (*Science*, Nov. 22) that "throw doubt on the current deficiency theory as a complete explanation of the pathogenesis of pernicious anemia."

Kidney excretions from pernicious anemia patients before treatment contain two substances, they report. One of these substances poisons pigeons; but before it poisons them it produces a dangerous decrease in the reticulocytes or young red cells of their blood. The other substance is relatively non-poisonous and stimulates the production of these young red cells. The excretions from normal persons and from pernicious anemia patients after treatment with liver extract do not contain the poisonous substance.

From this Drs. Wakerlin and Bruner conclude that the old idea of a poison being the cause of pernicious anemia may be correct. The poison, they believe, cuts down the production of red blood cells by its action on bone marrow.

If this theory is correct, they suggest that it may be possible to obtain enough of the poison to produce pernicious anemia in animals like the dog for further study of the disease and its cause.

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Leviathan

"CANST thou draw out Leviathan with an hook, or his tongue with a cord which thou lettest down?"

"He beholdeth all high things; he is a king over all the children of pride."

If one takes "children of pride" to signify all animals, the whale might well be hailed as king, for the larger modern whales are bigger than any other animal on the land or in the sea, living or extinct. The long-dead brontosaurus were the nearest approaches ever made to whales in point of size, and they did not reach even half his total displacement, though by grace of interminable necks and tails they did rival him in length.

But other verses of that famous forty-first chapter of Job have been set at nought by the technical advances of modern whaling. No longer can it be said, "He esteemeth iron as straw, and brass as rotten wood . . . Darts are counted as stubble; he laugheth at the shaking of a spear." The darts that now pursue poor Leviathan are hurled from the muzzles of cannon: a fair hit means a dead whale every time.

So serious has the situation become, with the depletion of the northern whaleries and the harrying of the persecuted monsters in their last refuge around Antarctica, that international cooperation is being enlisted in an effort to restrict the yearly kill to a point where the natural increase will replace it. Unless this is done, the largest animals that have ever lived will have to take their place with the dinosaurs in the limbo of things that have been.

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Clam chowder, succotash, clam cakes, and corn meal pudding are among the recipes that early colonists borrowed from the Indians.