SCIENCE NEWS

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THE NEW TELESCOPE FOR THE CALIFORNIA INSTITUTE OF TECHNOLOGY

THE largest unit of the great 200-inch diameter telescope being built for the California Institute of Technology has arrived at Pasadena after an ocean voyage from the East by way of the Panama Canal. It is the lower end of the telescope tube, weighing 19 tons, which will eventually be the containing unit for the block of glass soon to be shipped from the Corning Glass Works.

Los Angeles and Pasadena, with their proximity to Hollywood, have seen queer sights, but few more strange than the great wood-crated telescope unit being hauled slowly through the streets. It looked like some gigantic cheese, projecting over each side of the trailer by more than five feet.

The trip from San Pedro harbor to the laboratory at California Institute of Technology took five hours, an average of only five miles an hour. Only the widest streets could be used. Three more hours were spent in maneuvering the trailer up a ramp and around close clearances, with sometimes only three inches to spare, into the huge room where the frame is to be used first as a cell to hold the great glass disk while it is being ground and polished on the 100-ton machine built especially for the purpose.

Once inside the grinding room, further skidding over greased steel plates was unnecessary. A great crane already tested with 60-ton loads picked up the unit and put it in place.

After serving as a holder for the glass disk during the mirror grinding, the frame will be moved to Mount Palomar, where the new observatory is being built. In the meantime, however, the rest of the telescope must be constructed.

Next job in making the world's largest telescope is to finish the grinding machine by the time the glass disk arrives from the East so that the tedious and long optical work can proceed without interruption.

By the time the optical grinding is finished it is hoped that the observatory buildings and mechanical parts will be completed so that the whole instrument can be put into service. Several years will be needed for the whole plan even if all goes well.

ELIMINATION OF HEADLIGHT GLARE

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A NEW optical material which promises to save lives now lost in night driving because of headlight glare is announced by the Land Wheelwright Laboratories of Boston.

Known as polaroid, the new material is also to be used for sun glasses which take away light dazzle without darkening the view, and, even more important, make possible motion pictures in three dimensions that have the optical illusion of depth similar to viewing a scene with the naked eye.

Other uses promised include one-way glass for cross-court privacy in apartment buildings and brilliant building exteriors that change color as one walks by.

Polaroid resembles a sheet of glass but has the ability to polarize the light which passes through it. Now ready to be produced in unlimited quantities, the new material is the first practical use of what has formerly been a laboratory and research phenomenon.

Polarized light is light which vibrates only in one direction in contrast to the helter-skelter vibrations in the ordinary light ray. Polaroid acts to produce the polarized light. The best way to think of the complicated phenomenon is to regard ordinary light vibrations as a mass of straws tossed up in a wind. They are blown against a picket fence. All straws are stopped except those parallel to the slats in the fence and all straws coming through are lined up in one direction. The material polaroid acts as the picket fence.

For use in automobiles all headlights would send out polarized light vibrating in one direction and all windshields would be "crossed" so that they would not permit such headlight rays to enter and blind the driver.

The light from one's own headlights would strike the ground ahead, be scattered with the destruction of the polarization and hence such light would enter the car and make possible vision down the road just as headlights act now.

The American Optical Company, Southbridge, Mass., has been licensed to manufacture the new sun glasses, and the Eastman Kodak Company will produce polascreens, a special form of the material, which will make possible movies with depth.

The three-dimensional motion pictures are taken with a double camera having two lenses as far apart as the human eyes. When such films are shown the two views are projected on the same screen through polarizing sheets set at right angles to each other. The audience, supplied with glasses fitted with clear colorless polarizing lenses set at corresponding angles, sees one image with the left eye, the other with the right and gets the effect of actual presence at the scene. The world's first three-dimensional color movies have already been produced with the system.

For use in sun glasses the lenses of polaroid material discriminate between glare which is polarized and useful illumination which is not so cuts off completely the glare without obscuring the view.

COAL GASIFICATION

IN Siberia and in North Caucasia USSR mining engineers are burning coal mines underground for their gas content. Suggested by the famous British chemist, Sir William Ramsey, before the turn of the century as the most economical way to use coal deposits of the lower grades, the scheme of coal gasification project has been little used elsewhere in the world outside of Russia.

Sir William argued logically that for many purposes it was wasteful to dig mines and extensive cross shafts,

send men down to dig out the coal, ship it hundreds and thousands of miles and finally burn it to make coal gas for illumination, cooking and power. He recommended setting a coal deposit on fire and then by controlled draft and flues lead away the coal gas to the surface.

According to Russian tests the labor spent on the gas is only from one tenth to one sixth of that needed in mining. Moreover, it is possible to obtain gas from very narrow sheets of buried coal which would be unprofitable to mine in the ordinary sense.

In the process of burning coal beds for their gas content, a shaft is dug down to the coal and exhaust outlets sunk in other places over the coal deposit. The coal is ignited at the main shaft and air forced down to sustain combustion. The fumes from the burning coal are sucked out from the exhaust pipes only partially burned. There is much carbon monoxide present, for example, which can be piped to the site of use, or used by industry near the coal gas source.

The method of gasification has been discussed in the past in the United States as well as in England, but practical mining men believe it impossible to control the fire in such a way as to produce a useful fuel gas and that there would be a very great loss of coal as well as hazards introduced if men had to work underground adjacent to the fires. However, these experiments will be watched with great interest by American mining engineers.

THE PREVALENCE OF SILICOSIS

MORE than one million Americans are exposed to silica dust, the condition which may cause silicosis, sometimes called "miners' phthisis" or "miners' consumption," according to estimates of the U. S. Public Health Service.

Silicosis may affect not only workers engaged in rock cutting, as in the cases reported from Gauley Bridge, W. Va., which are attracting Congressional notice, but also those in the pottery, foundry, sand-blasting, abrasive, granite, tool and ax grinding, glass, slate, silica grinding and mining industries.

Not all those exposed to the dust get the disease, however. Probably one fourth of any large group exposed to the dust at any one time have silicosis, and most of those have it in the early stage. Very vew people die of silicosis. Silicosis patients usually die of some infection, particularly tuberculosis, to which they are especially susceptible.

Men having silicosis in the first stage of the disease have slight or no disability and may never have any disability, if placed in suitable surroundings. This does not mean that they must necessarily change their occupation. The surroundings in which they work can be made "suitable" by eliminating the silica dust from the air in which they work, or by reducing it to a safe limit. Men suffering from the disease in its second stage can improve materially, and even those suffering with the third stage of the disease can improve somewhat in "suitable" surroundings. The federal health service knows of no industry at the present time where the conditions causing silicosis can not be controlled.

In silicosis the lungs, instead of being spongy tissues with plenty of space for the air to circulate, become mottled with patches of fibrous tissue which is dense and prevents the passage of air. As the disease progresses, the patient has less and less normal lung tissue for breathing. Shortness of breath on exertion and sometimes a cough are the first symptoms of silicosis. In the early stages, however, the patients often do not know that they have the disease. They feel all right and are able to go on working and living normally. They even may and frequently do gain weight. It is when tuberculosis or some other infection sets in that the patients begin to lose weight and feel badly.

To prevent silicosis the U. S. Public Health Service recommends a combination of measures, no one alone being successful. These preventive measures are: methods of control of the dust at its source; good ventilation to dilute the amount of silica dust in the air, and physical examinations of the workers at the beginning of employment and periodically thereafter, to detect the presence of silicosis, and, even more important, of tuberculosis.

Conditions in practically all the silicosis-producing industries are definitely improving, according to the U. S. Public Health Service, but the surface has only been scratched and there is much dust yet to be controlled.

ITEMS

GOLDFISH have their color preferences. They like blue, Dr. N. Mookherji found from experiments reported to *The Indian Journal of Psychology*, published in Calcutta. The fish were allowed to pick their favorite color by making a choice of four stalls into which they might swim. Each stall was lighted by a candle shining through a piece of colored glass. The number of times the fish entered each stall and the lengths of time they lingered there were counted and tabulated. Blue was the favorite, and then came green, yellow, and red in that order.

REDUCTION in the cost of helium treatments for asthma is now possible through improvement in the method, according to an announcement made by Dr. Alvan L. Barach, of the School of Medicine of Columbia University. Dr. Barach is the originator of the method by which patients suffering from severe asthma are given relief by inhalation of a mixture of oxygen and helium. Because helium is a very light weight gas, it requires only half the effort to breathe the oxygen-helium mixture as to breathe ordinary air. This gives the patient's breathing muscles considerable relief and rest. While not a cure for asthma, the helium treatment has been found an effective remedy in combination with adrenalin. Helium, however, is an expensive gas, so only a few patients could get the benefit of the treatment. Dr. Barach now announces a method of re-using the helium, thus reducing expense. After the gas has left the patient's lungs it is circulated through soda-lime and returned to the apparatus to be used again.

Erratum: In the science review of the year by Science Service, printed in the issue of SCIENCE for January 3, it should have been stated that the ornithological expedition which made permanent records of the songs of birds in the south was under the auspices of Cornell University and the American Museum of Natural History.