

ASTRONOMY

Most Modern Telescope Taking First Looks at Sky

New Instrument of U. S. Naval Observatory Has 40-Inch Mirror With Special Curves and Is Air-Cooled

THE WORLD'S most modern telescope is now peering at the stars from the U. S. Naval Observatory, Washington, D. C.

With its great 40-inch diameter mirror fashioned to special curves devised by its maker, George W. Ritchey, this telescope will photograph a larger sky area than some telescopes that have larger mirrors.

Mr. Ritchey and his assistants are now engaged in making test photographic exposures to determine just how the new instrument performs. The telescope is designed especially for photographic observation.

Capt. J. F. Hellweg, superintendent of the U. S. Naval Observatory, considers that the telescope is now complete and he expects that it will soon go into active service adding new knowledge to astronomy.

It is the first air cooled telescope. This most modern accessory is not for the comfort of the astronomers who will use the telescope, but to assure better observations.

The entire observatory building is built of very light metal, with double walls, so that at night the temperature will soon become the same as the surrounding air. With more massive buildings, the stone and brick absorb heat all day, and give it off long into the night, producing objectionable air currents which spoil the clearness of the telescopic images. In order to keep the telescope at its night time temperature, a felt canopy will be placed over it in the daytime. This is connected with air cooling equipment, so that all day the telescope will be kept at the temperature expected that night.

The entire tube of the telescope is constructed with a unique system of counterpoises, so as to prevent bending. Convenience of the observer is also remembered, as he is provided with a movable observing platform which automatically keeps him at the eyepiece as the telescope turns to compensate for the rotation of the earth. Thus he does not need to interrupt his work fre-

quently to adjust himself.

The curves to which the mirrors are ground are novel. In a reflecting telescope the light from a star falls on a large concave mirror. It is then reflected to a smaller convex mirror above, thence back, through a hole in the large glass mirror to the eyepiece or photographic plate. With conventional reflecting telescopes, the large mirror is ground to the shape known as a paraboloid. Such a shape has the disadvantage of a very small field, that is, the star at which the telescope is directly pointed may be focused sharply, but others nearby are fuzzy. In astronomical photography it is desirable to have stars focused sharply over a larger area, and this can be accomplished by grinding the mir-

rors to new curves. These have been developed by Mr. Ritchey in collaboration with Henri Chrétien, French optician, and so the new instrument is known as the Ritchey-Chrétien telescope. The Naval Observatory installation is the second to use these curves. Several years ago, while in France, Mr. Ritchey constructed one with a 20-inch mirror, which is now in the possession of the Duc de Gramont.

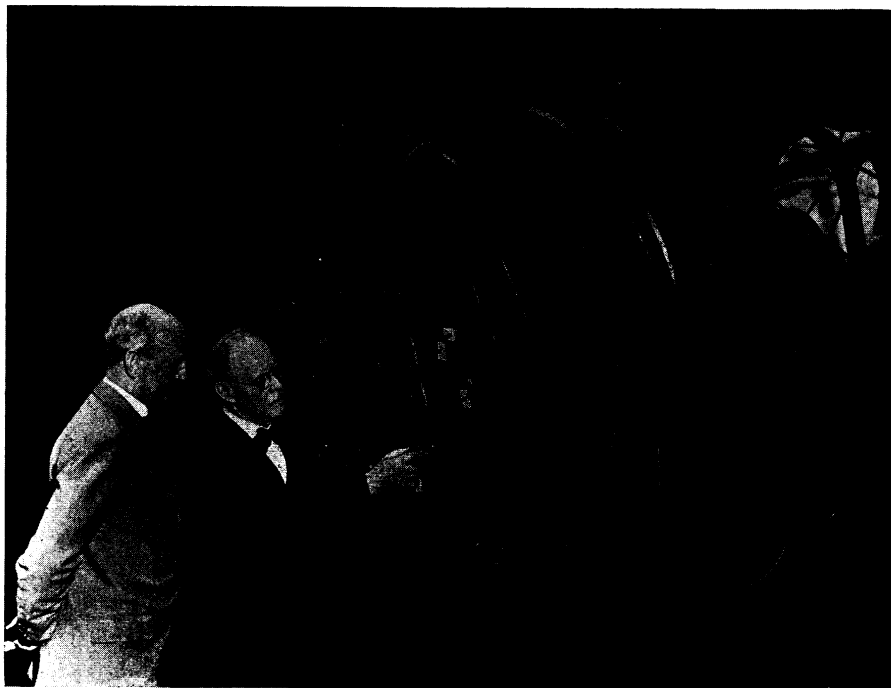
Science News Letter, May 26, 1934

PSYCHIC RESEARCH

Medium's "Force" Fails To Photograph in Infrared

IF THERE is a mysterious "force" which manifests itself when a medium goes into a trance, it has eluded the keen eye of infrared or heat rays.

To test the psychic powers of Rudi Schneider, well-known medium, two British investigators have made a series of experiments using an infrared light beam and also a camera installed with a movie film sensitive to infrared. The camera thus equipped is capable of taking pictures in feeble red light or even in the absence of visible light, thus



WORLD'S MOST MODERN TELESCOPE

George W. Ritchey lovingly adjusts the new great 40-inch telescope that he has labored three years to build for the U. S. Naval Observatory at Washington, D. C., while Capt. J. F. Hellweg, Superintendent of the Observatory looks on. The 40-inch mirror contained within the great bolt-studded base is fashioned to special curves devised by Mr. Ritchey. Although there are larger telescopes, this telescope will photograph a larger sky area than some telescopes with larger mirrors. It is about to go into service photographing the sky. It is the first air-cooled-telescope. A felt canopy above shrouds it during the day and air cooling equipment keeps the telescope at night temperatures so that the delicate mirror will not be distorted.

working in conditions of light that mediums usually prefer for their sittings.

Preliminary announcement of their findings is made to the scientific journal *Nature* by the investigators, Theodore Besterman and Oliver Gatty of the Society for Psychical Research in London, England.

The infrared film caught nothing unusual except the moving of a curtain.

When a beam of infrared light was used in connection with apparatus in the tests, there were frequent announcements by the trance personality that the "force" had entered the ray. Notwithstanding this, the two investigators

could obtain no evidence of absorptions of a beam of the infrared light.

While in a trance, the medium on several occasions announced that the "force" had gone into one of a pair of cotton-wool covered boxes and remained there for some fifteen minutes, but no change in temperature of the box could be detected.

During half an hour, the "force" could produce no significant difference in rate of growth of two strains of bacilli or of dormant yeast.

The investigators spoke highly of Mr. Schneider's willingness to submit to tests and control.

Science News Letter, May 26, 1934

MEDICINE

Pneumonia Cough Declared Not Useful in Fighting Disease

THE FREQUENT and violent cough typical of uncomplicated cases of pneumonia is neither useful nor ultimately helpful, as has been generally supposed, declared Dr. Arthur J. Hall, emeritus professor of medicine at the University of Sheffield and visiting physician to the South Yorkshire Mental Hospital, in a report to the *British Medical Journal* published in London.

This cough, instead of acting as a natural means of combating the disease, merely exhausts the patient, Prof. Hall concluded from a study of pneumonia in patients suffering from mental disease. He found that these patients may sometimes have pneumonia without any cough at all.

The general distress and the restless, sleepless nights typical of pneumonia were also absent in patients he observed, although they had fever, chest signs and other symptoms of the disease as do mentally sound persons.

In one of several similar cases a man of 62, suffering from chronic dementia, had an attack of pneumonia lasting a week; his temperature, ranging from 102 to 105 degrees Fahrenheit, the pseudo-crisis on the fifth day, and the crisis on the seventh day, were quite typical of the disease, from which he recovered. The man suffered no pain, had no sputum or delirium, and slept for seven hours each of the seven nights.

Prof. Hall believes that the absence of distress from the pneumonia in these

cases is due to the failure of the higher nerve-centers to register and respond to the disturbing stimuli, perhaps sometimes because there is actual deficiency of available receptive material and sometimes because this material is fully occupied in dealing with other and stronger stimuli. These theories he applies also to other combinations of physical and mental disease.

Science News Letter, May 26, 1934

PUBLIC HEALTH

Measles Epidemic Broke Record

MEASLES has broken a twenty-one-year record. The number of cases reported each week has been higher than at any time since the U. S. Public Health Service began keeping records of this disease in 1912.

The epidemic has just begun to abate, less than 30,000 cases being reported weekly now. At the peak of the epidemic, during the first week in April, 35,000 cases were reported by state health officials to the U. S. Public Health Service in Washington, D. C.

Science News Letter, May 26, 1934

Until five years ago, Bermuda depended entirely for fresh water on rain water or imported supplies from New York; now a method of collecting the underground fresh water, free from salt and made soft, has been evolved.

AVIATION

Sound Echoes Tell Height Of Airplane Above Ground

FEAR OF running aground in a fog, long known as one of the greatest terrors of air traffic, may be slated for the discard. The acoustic altimeter, new gadget for the pilot's instrument board, answers the question: How far are we from the cruel earth?

A new type of altimeter developed by Lieut. Leo P. Delsasso, U. S. Naval Reserve, gives a continuous succession of red flashes, each marking on a dial the exact height of the airplane from the earth at the moment of observation. Lieut. Delsasso, who is also physicist in the University of California at Los Angeles, measures distances as near as four feet and as far as seven hundred with great accuracy. With projected improvements a range of fifteen hundred feet or more is expected. Heretofore such instruments have usually been telephonic devices requiring constant listening and some calculation, possibly with the necessity of pistol shots to furnish intense sounds. Other altimeters are merely barometers, which tell distance from sea level. Unfortunately the sea is not usually the place the aviator is worried about.

In the Delsasso altimeter a hammer strikes a steel diaphragm, sending down a short sound wave train of high intensity, and at the high treble pitch of 2000 vibrations per second. The echo returning from earth is caught by a selective microphone tuned to the 2000 frequency. A bouncing contact on the receiving diaphragm, assisted by vacuum-tube amplification, flashes a neon lamp revolving at precise speed around a dial. The time of the round trip of the sound is read directly on the dial, not as time but in terms of distance in feet.

The loud noise of a flying airplane normally interferes seriously with acoustic devices. Lieut. Delsasso has analyzed the sounds of aircraft, and finds that the beat of the propeller blades against air generates most of the noise. Such beats give mostly low notes in the "bass" range of 20 to 60 vibrations per second, while the motor exhaust, of much less consequence, also registers in the low frequency brackets. The bouncing contact in the Delsasso instrument requires about ten million times as much sound energy to work at 20 vibrations as at 2000. Thus the plane