

## SEISMOLOGY

# Research Aimed at Future Prediction of Earthquakes

**Y**OU CAN NOT accurately predict something you do not thoroughly understand. This summarizes briefly the reply of Dr. H. O. Wood, Pasadena seismologist, to impatient questioners who want to know right away whether—or when—California is to have a great earthquake. Speaking at the University of California, Dr. Wood nevertheless reminded his questioners that the Southwest has had some stiff jolts in the past two hundred years.

Although the questioners were impatient, there is some justification for their solicitude. A large part of the educational system of California is in turmoil, with thousands of pupils in tents because of doubt cast on the stability of school buildings.

As seismologist for the Carnegie Institution of Washington Dr. Wood outlined in part the formidable program of research in pure science which must be carried out before earthquake forecasts can even be hoped for. At present the possibility of measurement of earth tilt at critical locations offers a beginning. Development of "tilt meters," whose design will undoubtedly require years of study, may permit advance information on coming temblors.

The main feature of Dr. Wood's research plan is a network of stations tributary to headquarters at Pasadena, and ranging from the Owens Valley to San Diego. High precision in the agreement of timepieces in these stations is very desirable, and is difficult by ordinary chronometer practice. Recently the outlying stations are receiving periodic signals from a single broadcasting station. Marks on different time charts made by such time signals need not agree with Pacific Standard Time, but do agree with each other, and accurately tell the relative time at which earth motion took place. In this manner accuracy of one quarter-second is easily attained, and sometimes as high as one-tenth second.

Incidentally, the Pasadena observers note that the time duration of local shocks proves nothing about the time elapsed during the original rock-slip, or blow that started the trouble. Recently

a huge single dynamite blast at Victorville, fifty miles from Pasadena, caused a thirty-second "earthquake" at the latter city. For a full half minute the seismographs continued to record the tremblings of the earth.

Current investigations seek to determine why all this extension and multiplication of motions. Possibly there are several distinct layers of the earth's crust in which the waves are carried, reflected, or refracted. What sort of maneuvers an earthquake shock carries out to extend itself from a single wallop to a half-minute shiver—that is still to be learned.

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## PHYSICS

## Infrared New Detective Aid to Art Connoisseurs

**I**NFRARED light, invisible to the human eye, has come to the aid of art connoisseurs in their search for the truth about questionable masterpieces of painting.

Infrared photography can be successfully used to detect the chemical composition of the paints that an artist employed on a canvas. So the American Association of Museums was told by Dr. Maximilian Toch, well-known New York chemist and specialist in scientific methods of examining paintings.

Even though two strokes of green paint may look alike to the naked eye, the infrared light will photograph one white and another black, if one is chromium oxide green and the other chrome green. Since certain pigments did not come into use by artists until certain historic periods, and since famous artists tended to choose the paints that best suited them, the kind of pigment on a canvas may be a significant clue to its age and authenticity, Dr. Toch showed.

"My contention," said Dr. Toch, "is that all pictures of a certain period by the same artist were painted with the same type of pigments, for even today one seldom finds a painter of note who flounders around and changes his pigments every few months.

"In the case of Frans Hals, Van Dyke, and men of that period, it is quite obvious that they had very few pigments to choose from and therefore any one of those paintings would show characteristic effects on the infrared plate. If, however, a student two hundred years later who ultimately became famous, copied one of these paintings, his work may be accepted as genuine—yet the pigments might be so totally different that the infrared might show them up completely."

Dr. Toch stated that he has photographed a large number of colors by infrared, all of which might be used as standards. Almost every color in use today is recorded.

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## MEDICINE

## Dog Distemper May Give Weapon Against Influenza

**P**OSSIBILITY that the virus causing dog distemper may provide man with a new weapon against influenza appears in a report of Drs. Adolph Eichhorn and Norman J. Pyle, veterinarians of Pearl River, to the American Medical Association.

The virus of human influenza apparently makes ferrets immune to attacks of dog distemper, Drs. Eichhorn and Pyle found. Their investigations suggest that the two diseases, influenza in man and distemper in dogs, are related somewhat as smallpox in man is related to the bovine disease, cowpox.

Vaccination of human beings against smallpox depends on this relation. Smallpox vaccine is made from the virus of cowpox. If distemper and influenza prove actually to be related, scientists may be able to develop from the distemper virus a vaccine that will protect against influenza. So far no successful vaccine against influenza has been developed. Drs. Eichhorn and Pyle are now working on experiments to determine the possibilities of producing such a vaccine from the dog distemper virus.

Their work so far has been confined to ferrets and their discovery that influenza protects these animals against distemper was made accidentally. They had been using ferrets for routine tests of canine distemper virus, when they decided to study an influenza virus obtained from human cases of the disease by the British investigators, Wilson Smith, C. H. Andrewes and P. P. Laid-