SEISMOLOGY

Research Aimed at Future Prediction of Earthquakes

YOU 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.

Science News Letter, July 14, 1934

PHYSICS

Infrared New Detective Aid to Art Connoisseurs

INFRARED 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.

Science News Letter, July 14, 1934

MEDICINE

Dog Distemper May Give Weapon Against Influenza

POSSIBILITY 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-

Science Service, Inc. is collaborating with JSTOR to digitize, preserve, and extend access to *The Science News-Letter.* www.jstor.org

law. The virus produced influenza in ferrets, just as the British investigators had reported. Much to the American scientists' surprise, however, they found that the ferrets after recovering from an influenza attack were immune to the distemper virus given for the routine tests of the latter.

Claims have been made before now that influenza and distemper are related but so far no definite proof has been presented of the identity or relationship of these viruses. Drs. Eichhorn and Pyle believe their experiments strongly point to such a relationship.

Science News Letter, July 14, 1934

GENERAL SCIENCE

Science Neglected Because Scientists Glorify Analysis

BECAUSE many scientists have taken a perfectly reputable Greek word and twisted it far out of the meaning it had for the Greeks who first used it, scientists today are having ever-increasing difficulty maintaining public confidence and material support. Thus, in effect, declared Prof. Wm. E. Ritter of the University of California, in a report to the American Association for the Advancement of Science.

"Surely no half-observant, sensitive worker in science today can avoid anxiety for its welfare," said Prof. Ritter. "The ground for such anxiety that may be noticed first is the tendency shown everywhere (except, ominously, in Russia) to make scientific research a special target of economy in financial expenditures. Illumined by what we have all heard and seen in this matter during the last two years particularly, it would be mere waste of time to prove the reality of that tendency."

Even graver than the withdrawal of financial support, however, Dr. Ritter considered the suspicion with which science has come to be viewed by many of the world's most influential intellects in non-scientific fields.

He expressed the feeling that this lack of confidence in science, by both legislators who control treasuries and philosophers who set fashions in opinions, is due in large part to the activities of many scientists in the past, who have over-stressed the value of analytic science, the kind of science that "picks things to pieces to see what makes them tick," and who have set this analytic science up as distinct from, and opposed to, synthetic science which views as wholes, and the great inclusive universe of things as itself a whole.

So far has this glorification of analysis proceeded, Prof. Ritter pointed out, that its typical and outstanding development has captured for itself the name "physics," which in its original Greek form "phüsis" meant simply "nature."

To the Greeks "phüsis," or "nature" had both analytic and synthetic shades of meaning, Prof. Ritter's inquiries into the uses of the word have convinced him, though they strongly favored the synthetic aspect at the expense of the analytic.

Prof. Ritter feels that to regain its lost ground and make further progress, science must re-emphasize the principle that analysis and synthesis are not opposed, but properly form a continuum.

Science News Letter, July 14, 1934

ETHNOLOGY

Blackfoot Indian Makes Sign Language Dictionary

THE dictionary of the Indian sign language is at last being finished.

Richard Sanderville, 70-year-old Blackfoot Indian, has come to Washington, D. C., to put the Indians' universal language on scientific record. He makes the signs with his hands. They are photographed by motion picture camera. They will be recorded on cards, several thousand cards, together with the English words they represent. And so the dictionary will be made.

At the Bureau of American Ethnology, where Mr. Sanderville is at work, he paused long enough to show how Indians talk when they meet other Indians of some foreign-speaking tribe.

A man on a horse is indicated by forking two fingers of one hand and setting them astride the fingers of the other hand. A proud person is shown by flinging back the head and holding one fist under the chin, thumb up, and the other fist below that thumb up.

ISN'T IT HOT!

The Indians have a sign for it—the hot weather, that is to say. Richard Sanderville, 70-year-old Blackfoot Indian has come to Washington to finish a dictionary of the Indian sign language for the Bureau of American Ethnology. To make the sign for hot weather, you simply spread out your hands before you, like the sun's rays bearing down. It's expressive, all right.

Indian sign language is old, but it adds new words to keep up with the times. An automobile is shown by jiggling the hands as if steering a wheel. For an airplane, you wave the arms at sides and then rotate one hand like a propellor.

Indians from coast to coast understand the international language of signs, says Mr. Sanderville, though the younger generation pays less attention to it.

Science News Letter, July 14, 1934

CHEMISTRY

More Radium in Ocean Mud Than in Rocks of Dry Land

MORE radium exists in the mud of the sea than in the ordinary rocks of dry land, Dr. Robley D. Evans of the University of California has found. His tests show that radium is being deposited constantly by ocean waters.

There is no hope of mining sea mud for radioactivity. Dr. Evans made his experiments merely to test his new method of detecting extremely minute amounts of radium and radon gas emitted by radium. Each ounce of mud contains three trillionths of an ounce of radium.

Science News Letter, July 14, 1934