

SEISMOLOGY

Earthquake Rocks the Dutch East Indies

AN EARTHQUAKE, characterized as "very severe," rocked the Dutch East Indies off the southwest coast of Sumatra on December 27, according to reports received by the U. S. Coast and Geodetic Survey.

The time of the intense quake was fixed at 9:34 p. m., Eastern Standard Time. The exact epicenter is still uncalculated, but its approximate location was 4 degrees south latitude and 96 degrees east longitude.

While seismological stations in Phulien, China; Sitka and College, Alaska; Manila; San Juan; Chicago; Berkeley; Ottawa; Ann Arbor, Mich.; Bozeman, Mont.; Tucson, Ariz.; Honolulu; Franklin Institute, Philadelphia; and Charlottesville, Va., all reported the shocks as very severe, they were so distributed that the exact latitude and longitude of the quake cannot yet be determined.

The region shaken by the quake is on the fringe of the Indian Ocean where the towering range of submarine mountains show themselves as the islands of the Dutch East Indies.

Science News Letter, January 18, 1936

ARCHAEOLOGY

Lost Ball Finally Found Centuries After the Game

HERE is a new American sport record: a rubber ball used by prehistoric American ball players has been found.

Of all the tall stories regarding lost balls, this one takes a high place. Never before in this ball-playing land has a ball turned up hundreds of years after the games were over and the spectators and players had gone home.

Dr. Charles Amsden, of the Southwest Museum, Los Angeles, announces in *The Masterkey* the finding of the old American sport symbol.

The ball was detected in the Museum, hiding unnoticed among a collection of relics from Arizona and northern Mexico. Dr. Emil W. Haury of Gila Pueblo, Globe, Arizona, brought it to attention.

It is a rounded, flattish lump the size of a small man's fist. It looks like dried clay, but underneath the crust it is hard and black, as well-dried rubber would look.

That Mayas and other Indians of ancient Mexico enjoyed ball games, and

used rubber balls in playing long before Europeans explored America, is well known. The courts in which they played their versions of America's national sport have been found in Mexico's ruined cities. But no ball has yet come to light in Mexico. Early Spanish records testify that the Mayan ball was solid rubber and larger than a baseball. Rings high in the court walls were used as goals.

It has recently been revealed that ball games spread as far north as Arizona a thousand years ago. Two ball courts have been identified. Now, a mashed and hardened ball actually turns up, and is recorded as coming from a Hohokam Indian ruin not far from Casa Grande, Arizona.

A chemist who has analyzed the object reports that it is "a natural, unrefined, and unvulcanized rubber hydrocarbon containing resins, waxes, and organic soluble materials in proportions similar to rubber contained in rubber-bearing plants of North America."

The botanical source of this rubber cannot be determined, the chemist says, without more exhaustive research on the sample and on rubber-bearing plants in southern United States and Mexico.

Of course, says Dr. Amsden, the rubber ball find raises other problems, as new finds in archaeology always do:

"Was it traded from Mexico, or did its users know the secret of extracting rubber from some local shrub? Every effort will be made to find a rubber expert who can give the answer."

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GEOLOGY

Glaciers Flow Faster On Warm, Sunny Days

GLACIERS are unlike the rivers to which they have been likened, in one thing at least. A river "just keeps rollin' along," while the rate of flow of a glacier depends in part on the weather.

This has been disclosed in a report of the Harvard-Dartmouth Crillon Expedition, which last summer made hourly observations on the great Crillon Glacier in Alaska, day and night for a whole week. It was found that the ice flowed nearly twice as fast in clear, warm weather as on dark, cloudy days.

Sometimes the ice came almost to a full stop, while at other times it flowed at a rate of more than two feet a day.

The expedition was under the leadership of Bradford Washburn.

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IN SCIENCE

PALEONTOLOGY

World's Largest Insect Died 150,000,000 Years Ago

FOSSIL remains of the world's largest insect, a prehistoric dragonfly nearly two and one half feet long, that was king of the air about 150,000,000 years ago, have been found near Elmo, Kansas, by Dr. Frank M. Carpenter of the Harvard Museum of Comparative Zoology.

Although only a part of one wing was discovered, the fact that many other smaller insects of a similar type have been found in excellently preserved condition, has enabled scientists to gauge accurately the size of this entire specimen. The huge insect was a member of the *Protodonata* group which lived in the Permian Age, about 150,000,000 years ago, when there were no birds or mammals on earth but only fish, amphibians, reptiles and invertebrates. With long thin bodies and good sized wings, these insects were the most powerful that ever lived and were undoubtedly supreme in the air in their time. They were exceptionally speedy and were so strong that they could cover great distances in one continuous flight. Their diet consisted mainly of smaller insects, probably cockroaches to a great extent, since these were also very plentiful at that time.

Harvard expeditions to these same limestone beds in Kansas in which this giant specimen was found, have already discovered more than 8,000 prehistoric insects. Vast swamps once covered this region and the insects which fell into the calcareous mud have been exceptionally well preserved in the finely grained limestone. Thus scientists can study the hairs, veins and every minute detail of these insects in exact likeness in stone today.

The only other insect ever found approaching this Harvard specimen was discovered in France about 50 years ago. Not quite as large as the latest specimen, this insect was a member of an allied genus, *Meganeura*, which lived during the Carboniferous Age, some time before the Permian.

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E FIELDS

BIOLOGY

Auxin, Growth Stimulator, Found in Chick Embryos

AUXIN, the substance formed by living things that stimulates growth, has been found in chick embryos, by Drs. True W. Robinson and Gilbert L. Woodside of Harvard University. They described their research in a paper presented before the meeting of the Zoological Society of America.

Auxin was first found in plants, and its effects have been studied most on plant growth. It was at first thought to be a monopoly of plants, but lately has been obtained from a number of animal sources, of which the chick embryos reported are the latest. Drs. Robinson and Woodside stated that they have also found auxin in the larvae of blowflies.

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GENERAL SCIENCE

Four Aims of Science Listed by Dr. Compton

SCIENTIFIC search for industrial and other new outlets for farm products, to do away with present temporary need for crop limitation;

Scientific improvements in industrial processes, to rid industry of its present self-imposed incubus of tariffs, quotas, and other legislative coddling that handicap efficiency;

Scientific attack on still-unconquered diseases, particularly the debilitating and disabling, rather than the deadly;

Finally, research in pure science, as the springboard for forward leaps in the applied sciences.

This was the fourfold platform laid down by Dr. Karl Compton, president of the American Association for the Advancement of Science, president of the Massachusetts Institute of Technology, and late Chairman of President Roosevelt's Science Advisory Board, in an address at St. Louis. Dr. Compton had been asked to talk on the subject "What's Next in Science?"

The speaker laid especial stress on the need for finding new outlets for

agricultural products, to supplement the traditional uses as goods, and fabrics. He looked especially to chemistry as agriculture's ally in this quest.

"The great problem of agriculture today is to discover new uses for these products," said Dr. Compton, "uses which will create new social values or partially replace the consumption of our exhaustible natural resources. Silk from wood, rubber from weeds, and motor fuel (alcohol mixed with gasoline) from corn and potatoes are actual examples of what can be done. Experience justifies belief that, along such lines, science may create new demands for farm products which will provide a constructive and permanent solution of the agricultural problem."

Concerning the possible contributions of science to industry, Dr. Compton continued: "I believe that a second line of increased activity in applied science will occur in industry—particularly in those industries which have hitherto depended largely on tariff protection, on monopolies, on exploitation of natural resources, on governmental subsidies or simply on momentum of past strength. These supports are temporary and precarious; sooner or later they fall before science, because no amount of artificial protection can permanently maintain an obsolete product, an inferior process or a moribund organization against competitors which are based on scientifically improved products or methods."

Dr. Compton's address was broadcast over the network of the Columbia Broadcasting System.

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CHEMISTRY

Sea Water Made Drinkable By New English Process

SEA WATER can be converted into fresh water by a new method developed in the British Government's experimental laboratories at Teddington.

The water is first passed through tubes of a synthetic resin made of formalin and tannic acid. These tubes absorb into their walls all the basic, or metallic and alkaline chemical elements. Then the water is passed through a second set of tubes made of a different kind of synthetic resin, compounded of formalin and anilin. These take out the acid-forming chemicals.

The emerging water is fit to drink, though admittedly not particularly palatable. In any case, however, it is quite suitable for use in steam boilers and for other industrial purposes.

Science News Letter, January 18, 1936

PHYSICS

"Supersonic" Sound Waves Help Make Better Films

PHOTOGRAPHIC films and plates have been much improved, in German manufacturing establishments, through the use of "supersonic" waves—sound waves vibrating so rapidly that they are inaudible to human ears. It has been found that the minute particles of silver bromide, which form the light-sensitive part of the photographic emulsion, are distributed more evenly over the surface, and do not tend to clump together, when the emulsion is treated with these extremely rapid vibrations.

Effects of supersonic waves on emulsions were first studied in the United States some years ago by Prof. R. W. Wood of the Johns Hopkins University and Dr. A. L. Loomis, working in the latter's private laboratory.

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ASTRONOMY

Scientists Shown Model of Second Largest Telescope

See Front Cover

AMODEL of the 82-inch reflector telescope and the towering structure now being constructed for the McDonald Observatory atop Mt. Locke in west Texas, was shown at the meeting of the American Association for the Advancement of Science.

"It would be hard to find any more eloquent example of the interdependence of the exact sciences than is represented in this telescope," said Warner Seely, secretary of the Warner and Swasey Company, which designed the instrument. "The precision in design, construction and operation of a telescope may be more obvious because of the distances involved, but the exactness which modern industry demands of machine tools is no less than that which science expects of its most delicate instruments."

The telescope will be one million times more powerful than the naked eye. Its three-ton mirror will have a concave surface approximately $1\frac{3}{8}$ inches deep coated with aluminum $1/1,000,000$ of an inch in thickness. No deviation from a true paraboloid greater than $1/1,000,000$ of an inch can be permitted on the mirror's surface.

The photograph of the model appearing on the cover of this week's SCIENCE NEWS LETTER was taken by the Warner and Swasey Company.

Science News Letter, January 18, 1936