

Correspondence.

Gravitation as a Cause of Volcanic Action.

To the Editor of the SCIENTIFIC AMERICAN:

Your correspondent in the issue of August 9, writing on "Gravitation as a Cause of Volcanic Action," evidently doubts that certain planetary positions cause electrical disturbances in the earth, and that volcanic and seismic action may be caused by electrical or magnetic influences. But let us consider carefully the evidence in favor of these propositions.

We know that magnetic earth currents (which interfere with telegraphing), brilliant auroras, severe thunderstorms, violent storms of many kinds, and also earthquakes and volcanic activity accompany sun spots. All these are electrical disturbances, and the eruption of Mount Vesuvius and numerous seismic shocks which occurred at the time of the last large sun spots—about September 15, 1898—were no doubt electrically caused by them.

The moon's equatorial passage has certainly no gravitational influence, and yet it must be something more than mere coincidence that severe volcanic and seismic disturbances have accompanied this planetary position every time during the past four months, with but one exception: None were reported for June 27; but the abnormally severe storms on and about that date proved the electrical effect. The moon's last equatorial passage, on August 21, caused terrific earthquakes in Mindanao, Philippine Islands, and a violent eruption of Mont Pelée on that date, more shocks at Los Alamos, Cal., on August 20, 21 and 22, earthquakes for two hours in Austria and violent tremors near St. Petersburg on the 22d, and an eruption of Mount Allomonte, Italy, beginning the same day. All these were two to four days after full moon and half-way between apogee and perigee.

Within twenty-four hours of the direct opposition of Saturn on July 17, there were terrific tremors on St. Vincent Island, cloudbursts in Illinois, a tornado in Ontario, and a typhoon at Hongkong—all electrical disturbances.

The recent severe earthquakes at Los Alamos, Cal., began a few hours after the very close conjunction of Mars and Neptune on July 27, and were most severe on that night and on the 31st, when Mercury was again in perihelion, and the day before perigee.

Mercury is found to have more influence in causing seismic and volcanic action than almost any other planet—probably because of its eccentric orbit, nearness to the sun, and frequent periods. About fifteen hours before the superior conjunction of Mercury on August 11 at 4 A. M., there was a severe earthquake and tidal wave at Juneau, Alaska, and there were frequent shocks at Los Alamos from 4 P. M., August 9, to 12 P. M. on the 12th, the most severe one occurring at 2:40 P. M. on the 10th. Mercury's equinox of August 27 probably caused the eruption of Mont Pelée on the afternoon before.

All the other earthquakes and volcanic eruptions reported in the newspapers during July and August, with but two exceptions, came just as expected according to this astronomic theory. Among these were the violent eruption of Mont Pelée on the evening of July 9—described and illustrated in the SCIENTIFIC AMERICAN of August 16—and also those on the 10th and morning of the 11th, the moon crossing the equator on July 10.

As to the electrical disturbances that accompany volcanic eruptions being "caused by the heat from the volcano"—as your correspondent maintains—that is, of course, partly true; and this electrical energy might also "touch off" other volcanoes; for I have certainly not altogether mistaken effect for cause, and these remarkable and constantly-recurring coincidences furnish a good proof that seismic and volcanic action may be electrically caused and that certain planetary positions, such as close conjunctions and oppositions, equinoxes, perihelions and perigees, cause electrical disturbances in the earth and also, probably, throughout the solar system.

Similar effects would probably result when several planets come directly into line with each other or with the sun, although not in line with the earth, and also if most or nearly all of the twenty other satellites should cross their primaries' equators at nearly the same time. Planetary positions of this kind must have occurred on May 20 and August 14.

The best way, it would seem, to prove and perfect this astronomic theory of volcanic action would be to compare the times of greater and less activity in some perpetually active volcano, like Stromboli, in the Mediterranean, or Sangay or Cotopaxi, in Ecuador, with the prevailing planetary positions. Here is a suggestion for the "international convention of scientists for the study of seismological problems," which—according to an Associated Press dispatch—Emperor William of Germany is endeavoring to bring about for next spring.

Just how certain planetary positions cause electrical disturbances in the solar system or disturb the electrical equilibrium is a subject for theorizing and in-

and architecturally it will harmonize well with its surroundings.

North from the Manhattan viaduct to 149th Street the greater part of the excavation has been done, although there are occasional stretches on which merely the looser surface material has been taken out and the bulk of the rock work is untouched. It is but fair to add that on this section from 139th Street to 144th Street the magnitude of the work has been greatly increased over the original design, owing to the intention of forming here a large underground storage station for trains. The width of the excavation has been doubled from 50 to 100 feet, and over this stretch of line will be eight parallel tracks. There are portions of the line on which no excavation has yet been done, for the reason that the contractor is completing the steel work on a given stretch of line, so that when he comes to excavate the adjoining section, he can use the material taken out for back filling and surface filling on the finished structure. Practically the whole of the excavation of the solid rock tunnel from 150th Street to 186th Street has been completed, while about 500 feet of tunnel has been driven from the northerly slope of Washington Heights at Fort George southward along the route of the tunnel. Between the shaft at 181st Street and the entrance to the tunnel at Fort George is a distance of 4,338 feet. Of this 1,450 feet have been driven northward from 181st Street and this in addition to the 500 feet driven southwest from Fort George leaves 2,488 feet yet to be tunneled. At the rate of 100 feet a month which is now being made, this part of the tunnel should be completed in about two years' time, or a little before contract date.

On the easterly branch of the system the tunneling from 103d Street beneath Central Park to Lenox Avenue has been completed and the open excavation from 110th Street and Lenox Avenue to 141st Street is almost all done. Over most of this section the steel and concrete work is completed and the street surface restored. From 141st Street to the Harlem River the work of excavation is in progress. The crossing of the Harlem is an extremely interesting piece of work. It is being done by dredging and by the use of cofferdams of 12 x 12 sheet piling. Most of the preliminary dredging has been done across the river, and about half the width has been covered by a cofferdam, the pumping out of which is now in progress. In the Mott Haven district the Subway for some eight or ten blocks is in course of excavation, and a large amount of work has been done; while the foundations for the elevated structure have all been built from Jackson Avenue up to the Bronx Park.

While the building of the line is making good progress, it is satisfactory to note that the provision of motive power and equipment is also being pushed along expeditiously. The great power house between Fifty-eighth and Fifty-ninth Streets and Eleventh and Twelfth Avenues is making fair progress, the foundation having been completed, while the plans for the buildings and machinery have been definitely settled, and the contracts are being executed. Eight 7,500 horse power engines direct-connected to eight 5,000 kilowatt generators will form the initial equipment, the power house property being large enough to admit of additions as there shall be a demand for them. The General Electric and Westinghouse Companies are competing for the important contract of furnishing the cars, of which 600 will be called for at the opening of the line. In about a month's time, tests will be made of specimen cars which have been built by these companies, illustrations of which are given on our front page of this issue. The specifications called for a multiple-control system, three cars out of five, or with five cars out of seven or eight in a train being motor cars. Provision has already been made for the rail-laying to the extent of letting a contract to the Pennsylvania Steel Company for 10,000 tons of rail, weighing 100 pounds to the yard. In this connection it is well to suggest to the engineers of the Rapid Transit Subway that they should carry out exhaustive tests on different systems of track to ascertain which will be the least noisy for use in the tunnel. With the heavy local traffic and with express trains thundering through the tunnel at speeds of 50 miles an hour and over, it is likely at best to be a very noisy place, and care should be taken to adopt that system of ties and track which will give the most silent running.

The Alligator Extinct in the South.

The alligator is said to be practically extinct in the South. To Dame Fashion may be attributed his passing away. The demand for shoes, satchels and pocket-books of alligator skin has been such within the last ten years that we will probably soon be compelled to visit our museums and zoos to hunt up the creature, which has unjustly earned an evil reputation as the terror of Southern swamps. Mr. J. Knight Perkins, of Kalamazoo, thoroughly searched the southern portions of the country for 14-foot alligators. In all New Orleans he could find but one alligator 10 feet long. He discovered that even little alligators from 4 to 8 inches long had disappeared from the market.

vestigation; but however difficult it may be to understand does not disprove the idea in the face of the evidence. There are many things we cannot explain the whys and wherefores of, such as the X-rays, wireless telegraphy, telepathy, clairvoyance, etc., but that should not prevent us from believing in and making use of these principles of nature. The scientific investigator must seek simply the truth, without bias or prejudice, no matter if reasons are not apparent.

The most probable dates in the coming two months for seismic and volcanic disturbances to begin or to reach a maximum are September 1, 3, 11, 17, 22, 23, 30; October 1, 10, 15, 16, 19, 23, 27 and 30.

Livermore, Cal.

ELMER G. STILL.

New Automobile Records.

Alexander Winton, seated in his famous "Bullet," broke all records on September 16 at the first annual meet of the Cleveland Automobile Club. The "Bullet" was started in the 10-mile open race against H. S. Harkness, of New York, who rode the Mercedes with which he won the majority of the prizes at the Brighton Beach races. After the first mile, which was made in the comparatively slow time of one minute and twenty seconds, the "Bullet" increased her speed. The time for the ten miles was ten minutes fifty seconds. The last five miles was made in five minutes and nineteen and one-quarter seconds. Twice during this 10-mile race Winton covered a mile in one minute two and three-quarters seconds. In the pursuit races run on the same occasion Winton established the record of one minute two and one-half seconds in the second mile.

Rollin White at the same meet drove his steam machine five miles in six minutes and forty-three seconds, which is a new record for that type of vehicle.

The world's records for speed have been beaten at the Deenville races, which were held on the 26th of August. Deenville is one of the principal French watering places, and the annual races which are held here are always of great interest. As at Nice, the track is a cement avenue bordering the sea. The race consisted of a kilometer dash (0.6 mile) and over 600 yards of track were allowed before the start in order to get up to speed. A great crowd of chauffeurs was assembled at Deenville, and most of the leading makes were entered. M. Serpollet had constructed two new racers which resembled the one he used at Nice, except that the new machines are pointed at both ends, being somewhat boat-shaped. There are places for two persons in the middle, but the latter are nearly concealed within the body. The race was held under favorable conditions as to weather, and a rather strong wind was blowing behind the chauffeurs, which may have had some effect on the speed. It was a Mors car which broke all previous speed records, and made the kilometer in 26 2-5 seconds, which is a speed of 78.6 miles an hour. This machine, which was piloted by Gabriel, belonged to the automobile class (maximum weight 2,200 pounds). Chaudard came just behind Gabriel, lacking only 1-5 second, thus making the kilometer in 26 1-5 seconds. He was mounted on a Panhard & Levassor racing car of the Paris-Vienna type, weighing 2,175 pounds. One of the Serpollet racers came next in 27 1-5 seconds. A Mors car followed in 28 seconds. It was piloted by Levegh and weighed 2,195 pounds. Rigal, on a Buchet motorcycle, made 28 4-5 seconds, as also a Panhard car of the automobile class. The German machines, of which there were two of the Mercedes type entered, also made a good record, 32 and 32 4-5 seconds. The lightweight class (up to 1,430 pounds) was headed by the Decauville, which made 30 1-5 seconds. It weighed 1,430 pounds, and was piloted by Théry. A Serpollet car mounted by Rutishauser made 31 1-5; its weight was 1,408 pounds, and it had a 12 horse power motor. The world's record of speed is now beaten by 1 4-5 seconds. It was held by Jarrott, who made 28 1-5 seconds at Welbeck on the 22d of August, thus beating Vanderbilt's record of 29 2-5 seconds on the Achères route.

The Current Supplement.

The current SUPPLEMENT, No. 1395, opens with a fully illustrated article on the manufacture of fresh-water pearl buttons. Mr. Edward P. Thompson writes on the inherent nature of coherers; and Prof. Henri Moissan tells of his new method of manipulating liquefied gases in sealed tubes. Electricity has not been neglected, for the SUPPLEMENT contains a fully illustrated article on "Some Uses of Electrical Pumping Machinery," and a description of the electrically-operated Belgian-Ougree blast furnaces and steel works. A resumé of the year's work in astronomy by Poincaré will be found of interest. The second installment of a review of the "Existing Methods of Cultivating Anaerobic Bacteria" is published. Among the minor articles may be mentioned those on "Italian Bell Towers," "A Simple Form of Fuel Calorimeter," "Calcium Carbide from Non-Electric Furnaces," "Foucault's Pendulum" and "Treasures of Savages."