his results for curves in space not at all by application of his method, but by simple projection from the Pascal hexagram. M. Folie objects to Veronese's using the term 'involution' instead of 'cyclic homography;' but an examination of the table of contents might have shown him that Veronese devotes a section of his paper to cyclic homographies, and he gives simply a natural extension to the ordinary meaning of the term 'involution.' But, worst of all, M. Folie makes a singular slip in the enunciation of the original question, for there are no points or lines in the figure which are known as the points or lines of either Hesse or Bauer. At the end, Veronese turns the tables upon his opponent, and points out several striking inconsistencies in his memoirs, and several instances of his peculiar 'art of phrasing:' as, "The greater part of these [M. Folie's] theorems had not yet been discovered, in spite of the depth and penetration of geometers;" "To deduce the corollaries from them would be an enterprise which would require, perhaps, years of labor;" "It is a field which I have cleared, and in which those who follow will find an ample harvest of discoveries."

In conclusion, we can but share the regret expressed by the direction of the *Annali*, that academies should so frequently provide unwisely for the advancement of science, either by proposing subjects which are too special, or by compelling authors to follow in their solution a direction determined *a priori*.

Christine Ladd Franklin.

OCCURRENCE OF AMBER NEAR TRENTON, N.J.

At the April meeting of the Trenton natural history society, the occurrence of amber in the bed of Crosswicks Creek was referred to, and no one of those present reported success in searching for it. The authority for its occurrence rests wholly, I believe, upon the statement in Comstock's Mineralogy (Boston, 1827), that it occurs 'near Trenton, N.J.,' and, again, "that found near Trenton occurs in small grains, and rests on lignite, or carbonated wood, or even penetrates it" (p. 297). I have several times met with small grains or pebbles of the mineral in the bed of Crosswicks Creek, and in 1860 found a mass as large as a pea, which I gave to the late W. S. Vaux, Esq., of Philadelphia. These small grains of amber, found in the bed of the creek, are undoubtedly derived from the beds of clay which are exposed in the bluff forming the southern bank of the creek. Clays of the same character and age (cretaceous) occur nearer Trenton than Crosswicks Creek; and in them, also, occurs much fossil wood. In and on this, grains of amber are not uncommon. They are usually very small, and difficult to detect. The fossil wood in this cretaceous clay is soft and very 'recent' in appearance, and burns with an uncertain, flickering flame. The scanty traces of amber found with this — derived, I suppose, from it — is the fossilized sap of the trees now found in these deposits of clay.

Charles C. Abbott.

THE TOTAL SOLAR ECLIPSE OF MAY 6.

The U. S. S. Hartford, which sailed from Callao, Peru, March 22, with the American and English astronomers on board, arrived at Caroline Island April 20, sixteen days before the date of the eclipse. The island is in reality a chain of small islands of coral formation, encircling a lagoon; the length of the enclosure being about seven miles and a half, and the breadth one mile and a half. The land is low, but supports an excellent growth of grass and other vegetation, including a number of cocoanut-trees. There are no permanent inhabitants; but the island is leased by an English firm which deals in guano, cocoanuts, and other products of this and similar Pacific islands. An agent of this firm visits the island occasionally, and superintends the work of those employed. Seven persons were found living on the island for the time being, having been brought there from Tahiti two months before. These were four men, one woman, and two children. There were two large frame houses in excellent condition, besides several smaller houses, which furnished comfortable accommodations for the party, and also for the French astronomers, who arrived two days later in the L'Eclaireur. The latter party was composed of the following scientific men: M. Janssen of Meudon; M. Tacchini of Rome; M. Palisa of Vienna, formerly of Pola; M. Trouvelot of Meudon, formerly of Cambridge, Mass.; and M. Pasteur, photographer, also of Meudon.

The landing of the heavy cases containing the instruments was accomplished with difficulty, as even the small ship's boats could not come within several hundred feet of the shore, which was composed of rough coral rock. The cases were taken from the boats by men standing in about two feet of water, and carried to the shore, thence across several hundred feet of coral rock to the land, and about a quarter of a mile farther to the site selected for the ob-

servations. After the completion of the landing, the men-of-war steamed away to Tahiti, leaving selected members of their companies to assist in the work. The American party was favored with the help of Messrs. Qualtrough, Dixon, Fletcher, and Doyle, officers of the Hartford, and of ten seamen.

The two weeks preceding the eclipse were occupied in mounting the instruments and in other preparations. Pendulum observations during this time were made by Messrs. Preston and Brown, under instructions from the U. S. coast and geodetic survey. The weather was in general pleasant; though there was one severe rain-storm, and nearly every day there were flying clouds with slight showers, as is not unusual in the region of the trade-winds. The wind was usually strong, and blew steadily from a direction varying from north to east, but never south of east, though the island is in the heart of the south-east trade region. Eight inches of rain fell during the seventeen days which the party spent on the island, more than half of this in one storm on May 4.

The weather on the morning of May 6 was cloudy and threatening; but after several showers the sky cleared shortly before the time of first contact, and remained clear the remainder of the day, with rapidly moving clouds. One of these partially concealed the corona for about twenty seconds in the first minute of totality, and the sun was wholly in a cloud soon after the close of totality; but the observations were not interfered with, though there was at all times haze in the atmosphere. Your readers have already been informed of the nature of the observations planned. All these were carried out successfully, with results which will be given in full detail in the official report of the expedition. A summary of these results can, however, be given at the present time. Professor Holden swept for intra-Mercurial planets, but discovered none. Spectroscopic observations were made by Dr. Hastings and Messrs. Rockwell, Brown, and Upton, with interesting results. Dr. Hastings had devised a spectroscope by which the spectra of two opposite sides of the sun were brought into juxtaposition, and could be examined simultaneously. This instrument, which was attached to a 6¼-inch equatorial, was used especially to note the changes in the appearance of the 1474 line on the preceding and following limbs of the sun as the eclipse progressed. At the beginning of totality the 1474 line extended to a height of about 12′ on the eastern limb of the sun, while on the western limb it was faint, and not more than 4′ in height. As the eclipse progressed, the lines changed relatively, becoming sensibly equal at mid-eclipse, and the conditions at the close of totality being the reverse of those at the beginning. This change was many times greater than any change due to the moon's motion, and is regarded by Dr. Hastings as conclusive proof that the outer corona is mainly due to diffraction. The dark D lines were seen in the corona, and the bright hydrogen and magnesium lines by several observers. The relative height and brightness of the coronal rings seen in an integrating spectroscope were estimated.

The duration of totality was five minutes twenty-five seconds. The corona was bright, and characterized by five well-defined streamers, a careful sketch of which was made by Dr. Dixon. The azimuths of the shadow-fringes at the beginning and end of totality were obtained, and their distances from each other estimated. The meteorological observations made by Mr. Upton showed a slight but well-defined rise in barometric pressure, a rise in humidity, and a fall in temperature. The temperature reached the values given at night, while the radiation thermometers indicated that the receipt of heat by the earth was almost wholly checked. The direction and velocity of the wind were unchanged during the time of the eclipse.

The photographs obtained by Messrs. Lawrance and Woods, the English members of the party, who were assisted by Mr. Qualtrough of the Hartford, include a series of negatives of the corona to its outer limits, and also of the coronal spectrum. The latter contains a few bright lines, but not as many as were obtained by the same observers in Egypt a year ago. The phenomenon of reversal of the Frauenhofer lines was also successfully photographed.

The French astronomers obtained many photographic negatives of the corona, and of the sky in the vicinity of the sun, to aid in the search for Vulcan. M. Palisa searched for intra-Mercurial planets without success. M. Janssen saw dark lines in the coronal spectrum, and M. Tacchini a faint spectrum resembling that of comets in one of the coronal streamers. M. Trouvelot made a sketch of the corona, and devoted also a portion of the time to the search for intra-Mercurial planets.

The Hartford returned to Caroline Island on the 8th of May, and on the 9th sailed for Honolulu, which was reached on the 30th; a stop of four days having been made at Hilo, Hawaii, to allow a visit to the volcano of

Kilauea. The members of the expedition, except Messrs. Preston and Brown, who remained at the Hawaiian Islands to make pendulum observations, left Honolulu by the steamer Zealandia on the 4th of June, and arrived at San Francisco June 11. W. U.

technical society a piece of apparatus, shown in the illustration, which, when connected in circuit with a telegraph-line, will show the varying strength of the current in the line, registering the results on a diagram. The earth-currents are generally very weak, and only can be

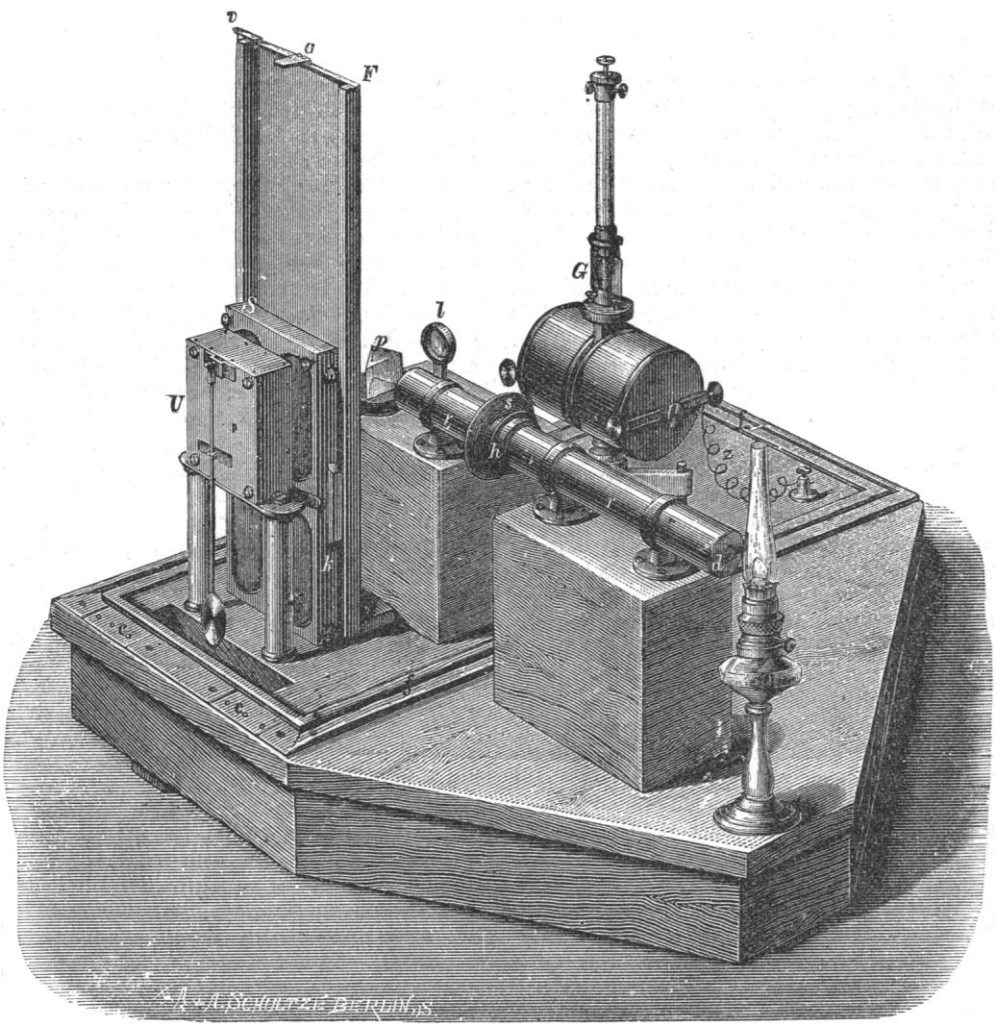

Fig. 1.

REGISTERING APPARATUS FOR EARTH-CURRENTS.[1]

For the purpose of studying the earth-currents on telegraph-lines, the instrument-maker, Wauschaff of Berlin, has made for the earth-current committee of the German electro-

shown by the most delicate galvanometers, so that no registering apparatus requiring a great amount of force could be used. This necessitated the use of photography. That the observations might be independent of the hour of the day, an artificial source of light was used. The most sensitive dry plates were employed, and, to keep out all extraneous light, the

[1] From the April number of *Zeitschrift für instrumentenkunde.*