DISCUSSION AND CORRESPONDENCE.

A VISUAL PHENOMENON.

TO THE EDITOR OF SCIENCE: Dr. Gould's interesting statement concerning a 'hitherto undescribed visual phenomenon' induces me to add the following note. In 1897 during a month's inspection of the Ural region under the auspices of the Russian government, our special train stopped one night on a side track near a station on the Siberian border. Some of our party were attending an entertainment given at some distance and expected to return on foot during the night, which was dark, with a slight drizzling rain. At about ten o'clock I was watching, through a glass window in the rear of the car, a light which I supposed to be a lantern in the hands of my returning fellow travelers. There was no other light visible, and as I looked, it seemed evident that the light was descending the face of a far sloping hill reaching to the railway; but the motion was by a series of lateral jerks first to the right and again to the left, each excursion, however, bringing it, *apparently,* lower and nearer. At first the motion amused me, later it interested me, and when, after steadily observing the phenomenon for a considerable time, I found the light had actually not moved from the spot where I first saw it, I was astonished. In this frame of mind my friend, Professor I. C. White, found me, and not being able to see what I described, doubtless formed an opinion of me as unjust as mine was of the supposed revelers who seemed to be coming home in a decidedly zig-zag course. On my return to Philadelphia I described the phenomenon to Dr. de Schweinitz and others. I found I could reproduce the delusion at will by looking from any dark place at a single light; as, for instance, on a cloudy night from the sea beach at the distant light of a ship on the horizon. Whether looked at with one eye or with two, the light always gives the impression of moving by jerks either sidewise or vertically, but in the former case it always seems to progress slowly downward or upward.

Under the conditions above described the phenomenon appears not to be controllable by the will.

PERSIFOR FRAZER.

SHORTER ARTICLES.

CORTICIUM VAGUM B. AND C. VAR. SOLANI BURT. A FRUITING STAGE OF RHIZOCTONIA SOLANI.

A STUDY of the *Rhizoctonia* of the potato was begun by the Colorado Experiment Station in the spring of 1901. It soon became evident that it is not a sterile fungus and much time has been given to the discovery of a fruiting stage. Observations show that potato plants developed from tubers which are more or less covered with sclerotia of this fungus usually have their subterranean parts overrun with a dark brown cobweb-like mycelium. This covering frequently extends up the green stems from one to three inches above the ground, forming a thin hymenial layer which is usually gray-white in color. This layer does not adhere firmly to the stem and cracks very easily when it becomes dry, consequently it disappears soon after the death of the plant.

The tip of the outermost branches of this hymenial layer become changed into basidia, bearing from two to six sterigmata. The spores are hyaline, and usually ovate in form, with apiculate bases. Fifty spores taken just as they occurred on a green stem gave an average measurement of 10 by 6 μ. But spores after they had fallen averaged 12 by 8 μ. Thus far a pure culture of this fungus has not been obtained directly from spores, but cultures made from the hymenial layer invariably produce a luxuriant growth of *Rhizoctonia.*

The main character of this green stem form agrees with *Corticium vagum* B. & C., but on account of the spore differences and parasitic mode of life, it has been thought wise to make a variety of this form for which Dr. E. A. Burt has suggested *Corticium vagum* B. & C. var. *solani.* It also agrees closely with the description of *Hypnochus solani* Prill & Del, and they may eventually prove to be the same.

FORT COLLINS, COLO., F. M. ROLFS.
October 19, 1903.

RESULTS OF THE RESURVEY OF LONG ISLAND, NEW YORK.*

NOTWITHSTANDING Long Island has been many times studied by geologists a considerable

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number of new facts, some of them of quite far-reaching importance, were established by the resurvey of the island by the Division of Hydrology,* United States Geological Survey during the past summer. The more important results are included in the following summary:

1. Long Island, instead of consisting almost entirely of glacial deposits, as was once thought, is now known to possess throughout a large portion of its extent a core of older Cretaceous beds, rising in places to nearly 300 feet above sea level.

2. These Cretaceous beds are not limited to the north shore, as has frequently been supposed, but rise nearly to the tops of the highest hills and extend far to the south, either at the surface, as in the West Hills, or at slight depths beneath the gravel plain on the south side of the island.

3. This Cretaceous nucleus has been found to have been deeply eroded before the deposition of the earliest glacial deposits.

4. The present field work has led to the discovery of greensand in the West Hills, thereby suggesting if not establishing the Upper Cretaceous age of the deposits in question. A considerable thickness of the underlying black and chocolate clays may also be of the same age.

5. The dip of the Cretaceous of the north shore has been determined for the first time, well records showing it to be, in the Oyster Bay region, south 23° east and about 65 feet per mile.

6. The absence of the great masses of Tertiary clays and gravels, assumed to be present by earlier workers, was established beyond question.

7. The yellow gravels formerly assigned to the Tertiary, and considered as constituting a considerable mass overlying the supposed Chesapeake (Tertiary) clays, have been shown to constitute the first of the glacial series (probably Pre-Kansan) of the Quaternary, and normally to underlie the clays instead of overlying them. The gravels were greatly eroded before the deposition of the clays, the deep valley reaching 280 feet below the present sea level which underlies Jamaica, and Jamaica Bay, and which seems to be the logical continuation of the submerged valley shown by the soundings of the Coast and Geodetic Survey off New York harbor, probably being completed if not largely formed at this time.

8. The supposed Chesapeake clays have been differentiated into three distinct formations: the first including the clays near Bethpage and Wyandance being referred to the Cretaceous; the second comprising the buried clays beneath Jamaica and Jamaica Bay belonging to an early interglacial (probably Yarmouth), and the third including East Williston and similar clays to the late glacial (Wisconsin) stage.

9. The portion of the supposed Chesapeake clays beneath Jamaica, Jamaica Bay, etc., were shown to be underlain by glacial gravels of the second ice invasion (probably Kansan), while the clays themselves were proved to have been deposited in the interglacial period (Yarmouth) between the second and third invasions. The area of the clays has been traced out by borings, and the clays themselves shown to represent salt marsh, or submarine deposits formed around the Cretaceous core when the land stood fifty feet higher than at present.

10. The known areas of the Manhasset gravels have been greatly extended to the south and east, having been recognized at Rockaway Ridge, Barnums Island, Bethpage, Half Hollow Hills and eastward beneath Shelter Island, and on the south fluke nearly to Montauk. Its age is probably Iowan.

11. The Manhasset gravels have been proved normally to underlie the moraines instead of resting against them as has sometimes been urged. Actual sections showing the relations were found.

12. Very little of the total height of the ridges is generally due to the morainal deposits themselves, the moraines either resting upon or constituting a coating over the older Manhasset, Pensauken or Cretaceous beds constituting the main mass of the elevations.

* Executive and areal work was in charge of M. L. Fuller, and the underground geology and water problems were in charge of A. C. Veatch.

13. The outwash deposits of the two Wisconsin stages are likewise relatively thin, being generally underlain at slight depths by one or the other of the older formations described.

14. Three groups of artesian wells have been recognized: (1) the deep Cretaceous wells, (2) wells in the Jameco gravels, and (3) shallow wells in the Pleistocene deposits of the north shore.

15. The deep Cretaceous wells are found both on the north and south shores. In both localities the water horizon has a regular southeastward dip. The source of the water in the south shore wells, except in the Barren Island well, is probably in the highlands of the island itself where the beds rise to the surface. In the north shore wells and in the Barren Island well, which perhaps obtains its supply from the same water-bearing horizon, the original source of the water is not yet established, although the problem is under investigation.

16. The Jameco wells obtain their supply from the glacial gravels (Kansan) occupying the deep and well-defined channel extending beneath Jamaica and Jamaica Bay and underlying the thick clays of the succeeding (Yarmouth) interglacial stage. The supply is derived from the ground water entering the gravels under the landward edge of the overlying clay. Because of the coarseness of the gravel the water is given up freely.

17. The shallow north shore artesian wells are generally restricted to the upper halves of the deep reentrant bays, generally at the base of steep slopes. The source of supply is from the ground water of the glacial gravels and sands, the flow taking place by virtue of the freer passage afforded by the wells than by the gravels.

18. The great thickness of the sandy layers of the Cretaceous under the higher portions of the island, the extent to which the Cretaceous water-bearing sands have already been developed and the probability that a number of water horizons have been previously overlooked because of search for a coarse gravel like the Jameco, makes the recommendation made by Professor C. S. Slichter regarding the advisability of sinking deep wells with casing perforated at each water-bearing horizon particularly pertinent.

M. L. FULLER,
A. C. VEATCH.

CURRENT NOTES ON METEOROLOGY.

BLOOD COUNTS AT HIGH ALTITUDES.

Nos. 8 and 9 of Vol. III., *Bulletin of the Hadley Climatological Laboratory of the University of New Mexico,* deal with 'Cold as a Causal Factor in the Blood Changes due to High Altitude,' and with 'Further Observations on Increased Blood Counts due to High Altitude.' The first paper is by John Weinzirl, M.S., and the second, by the same author with the cooperation of C. E. Magnusson, Ph.D., is a study the prosecution of which was aided by a grant from the Elizabeth Thomson Fund. The fact of an increased number of red blood corpuscles at high altitudes is well known, and has been investigated by Bert, Egli-Sinclair, Viault, Müntz, Egger and others. By means of blood counts in the cases of human beings and of rabbits, the authors of these papers come to the conclusions that cold is an important, though not the only, factor in producing blood changes at high altitudes, and that the increase in the number of red corpuscles due to altitude is temporary (as, it should be noted, has already been shown by several writers), this temporary increase being very largely due to the change in the temperature and not to the diminished pressure.

WEST INDIA HURRICANES.

ON the 'Pilot Chart of the North Atlantic Ocean' for September last there is a brief but well-arranged summary of the most important facts regarding West India hurricanes, prepared by James Page, of the United States Hydrographic Office (reprinted from H. O. Publication, No. 86). Of 56 hurricanes recorded by the Hydrographic Office between 1890 and 1900, 41 occurred in September and October. Instead of the old 'Eight Point Rule,' which is now known to hold only for the central portion of the storm, seamen are at present instructed that 'six