LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Nervous Diseases and Civilization.

IN Dr. Brinton's note on "Nervous Diseases in Low Races and Stages of Culture" in your issue of Dec. 16, he holds that those are in error who claim that "diseases of the nervous system have greatly increased with the development of civilization." My own very positive conviction, based upon a somewhat extended experience in the treatment of neurasthenic cases, is quite the reverse of this. In hospitals, in dispensaries, and among the very poor everywhere, a typical case of neurasthenia is difficult to find, but among the well-to-do and the intellectual, and especially among those in the professions and in the higher walks of business life who are in deadly earnest in the race for place and power, this peculiar impoverishment of nerve force that we term "neurasthenia" appears with alarming frequency.

Dr. Brinton says also that "civilization, so far from increasing this class of maladies, is one of the most efficient agents in reducing them in number and severity, especially when freed from religious excitement and competitive anxieties."

It should, however, be remembered that these "competitive anxieties," this worry of business and professional life, are the very conditions that civilization fosters and intensifies, and therefore civilization itself, with all that the term implies, with its railway, telegraph, telephone, and periodical press, exciting in ten thousand ways cerebral activity and worry, is the primary cause of this increase of nervousness among the higher classes in all countries. American nervousness is becoming almost a distinctive phrase, and it cannot be denied that in this country there are climatic conditions, and business and social environments, to the influence of which the nervous system is peculiarly susceptible, especially if complicated with evil habits, excesses, tobacco, alcohol, worry, and special excitements. In the older countries men plod along in the footsteps of their fathers, generation after generation, with little possibility, and therefore little thought, of entering a higher social grade. Here, on the contrary, no one is content to rest, with the possibility ever before him of stepping higher, and the race of life is all haste and unrest.

It has been aptly said that "the human body is a reservoir of force constantly escaping, constantly being renewed from the one centre of force — the sun." A perfectly healthy man has a large amount of nerve force in reserve, and this reserve is not often exhausted, even approximately, by the necessary toil and wear of mind and muscle. A nervously exhausted man has a small amount of nerve force in reserve, and this reserve is often and speedily exhausted.

The margin on which he can draw is narrow, may be almost wiped out under the calls of emotion and of mental and bodily labor, but, just as with the strong man, the force is renewed from without by food and repose, so, like the strong man, he can keep on thinking and worrying until he dies, which may be long after the death of the strong man. While nervousness makes life painful and irritating, it does not of necessity shorten life, nor does it always destroy its usefulness. "The Indian squaw, sitting in front of her wigwam, keeps almost all of her force in reserve. The slow and easy drudgery of the savage domestic life in the open air, unblessed and uncursed by the exhausting sentiment of love, without reading or writing or calculating, without past or future, and only a dull present, never calls for the full quota of available nerve force; the larger part is always lying on its arms. The sensitive white woman — pre-eminently the American woman — with small inherited endowment of force; living indoors; torn and crossed by happy or unhappy love; subsisting on fiction, journals, receptions; waylaid at all hours by the cruelest of all robbers, worry and ambition, that seize the last unit of her force, can never hold a powerful reserve, but must live, and does live, in a physical sense, from hand to mouth, giving out quite as fast as she takes in,— much faster oftentimes,— and needing longer periods of rest before and after any important campaign, and yet living as long as her Indian sister,— much longer it may be,— bearing age far better, and carrying the affections and the feelings of youth into the decline of life" (Beard's "Sexual Neurasthenia," edited by A. D. Rockwell, M.D., E. B. Treat, New York publisher).

While Americans are undoubtedly a particularly nervous people, it is well to remember that a large number who think themselves nervously exhausted altogether misconceive their real condition. There is a vanity of disease as well as of dress. Many would rather be thought nervous than bilious or gouty, and are pleased with a diagnosis which touches the nerves rather than the stomach, bowels, or liver. As a matter of fact, the nervous system in many of these cases is strong enough, and would give no trouble were it not poisoned by the abnormal products of digestion that enter the blood and circulate freely through every tissue of the body, and the practical and all-important point is, to differentiate between these two classes. The array of symptoms in each class of cases is so much alike that real impoverishment of nerve force due to overwork and worry is often confounded with a poisoned condition of the system, the result of indolent habits and an excess of food; and, instead of rest, quiet, and soothing draughts, there is need of mental and physical activity,— less not more food, depletion rather than repletion.

New York. A. D. ROCKWELL, M.D.

Observations on the Cretaceous at Gay Head.

SINCE my good friend Mr. David White has thought it worth while to give me a gentle reminder that I have been "a little confident and hasty in naming the various terranes at Gay Head," it seems becoming and necessary that I should offer a few short remarks in elucidation of my statements published in these columns Sept. 23, 1892, and somewhat more fully in the Transactions of the Maryland Academy of Sciences, 1892, pp. 204–212. The points of difference between Mr. White and myself are not so great as to cause questions of moment to arise from their statement. It seems evident to me that if we could visit Gay Head together for only a few hours he would not be able to resist the evidence of observation which results from clearing away the covering of the face of the bluffs. My statements were derived from an examination of the body of the hill behind the loose, or thrown, material spread upon its faces In order to get at the beds *in place*, and which really constitute the promontory of Gay Head, it was necessary to dig away a few feet, or inches, of sand, clay, marl, and other slipped material from many parts of the face of the bluffs. This I did with the assistance of men from the neighborhood, and by this means it became possible for me to see that the axis of the whole system was a lead-colored clay, and that upon this eroded ridge of clay, which descends below lowest tide-level, all the other geological members rest in their usual nearly horizontal order of sequence, as in Maryland and New Jersey. Since my return home, I have compared this clay more thoroughly with samples from the Woodbridge and Amboy districts of New Jersey, and the conviction is pressed upon me that the two are identical, as far as regards elements and type of structure. Nevertheless, as I have not found fossils in this clay, it is not possible for me to decide as to its exact horizon. From its relative position in the column of strata, it should belong near the middle of the Albirupean formation, and therefore it should be a homologue of the dark member of the clay which occurs in the upper middle portion of the terranes at both Amboy and Woodbridge. The fact should not be forgotten that there are three distinct types of "Variegated Clay," and that these three belong to levels wide apart, and in three different formations, viz., the Potomac, the Albirupean, and the Raritan All these become variegated by disturbance and saturation with iron-bearing waters, while in their unchanged condition they are either lead-colored or drab. The use of the term "Potomac" in the papers above cited was in deference to the usage of Messrs. McGee and Darton, but with the accumulated evidence now present to my mind it does not seem likely that the axial clay of Gay Head and Martha's Vineyard can be referred to the "Variegated Clay" of the Potomac formation as designated by Professor Fontaine and myself.

With regard to the Miocene fossils, especially the Cetacean vertebræ, settled into the broken surface of the Greensand, I did not enter into detail as to a wider distribution of these remains. It was not necessary for me to open out another series of observations beyond my immediate purpose. Let it suffice to say, however, that these remains are not confined to the surface of the Greensand, but that other specimens of the same were found by my own efforts at various points beyond this section of the bluffs.

I cannot admit that "each season presents new phases and unsettled local stratigraphic complications" in more than a superficial sense. The body of the promontory is not broken up, although every storm does abstract from or disturb a part of its face. Photographs in my possession show various changes which have been made from time to time in the ends and sides of the beds there exposed, but not a dislocation of the main body of the ridge. They confirm also the observation that several buttresses of the "Raritan" resting upon the lead-colored clay extend outward in original order from the ridge, while the intervening ones flanking the gullies are built of overthrown strata.

The so-called faulting is of a type common to clayey and sandy terranes, such as we are familiar with in the tide-water region of Maryland, where atmospheric agents, especially frost and thawing, open cracks somewhat parallel to the brow of a bluff. These cracks gape wider and extend deeper as the power of the sun increases, and at length cause a down-slide or fall when the beds become weakened by saturation with rain-water. Such fissures are also opened more widely and deeply by the dropping into them of coarse sand and pebbles, which spread apart by freezing and thawing. A notable example of this kind occurred to my observation on the projection of a heavy body of massive granite on Jones's branch, near Baltimore, where a fissure caused by freezing and thawing was gradually opened by an influx of sand, but which burst apart with almost explosive force one afternoon in the spring, following a season when numerous quartz pebbles had fallen into the crack from the overlying soil. The same phenomenon may be seen in the broken masses of granite which occur in places along the shores of Fisher's Island, near New London, Conn.

Several years ago, when many of the trees had been cleared from the brow of the cliffs of Potomac clay, along the shores of the Patapsco River, fissuring took place at intervals near the borders of these hills, and downthrows from the front of the bluffs were of common occurrence. In connection with such movements, and especially following a season of heavy autumnal rains, large cavities were rent in the cracking clays, some of which were large enough to admit a moderately large boy.

An example of the Gay-Head type of slipping, crushing, and swelling out, on a somewhat smaller scale, may be seen adjoining Sullivan's Cove, at the north-western end of Round Bay, Severn River, Md., and several of the same features, on a grand scale, may be studied next the face of Maulden's ridge, on the North-east River, Md.

The type of cutting and downthrow of the bluffs on the Vineyard Sound side of Gay Head is far more complex and varied than that of the south-west, or Atlantic, side. On the former the diagonal stroke of a surf from the south-east would cut deeper than the straight forward blow of the Atlantic on the south shore, and accordingly would be more effective in undermining the face of the terrane. The effects of those two methods of erosion are well shown on the opposite sides of this coast.

With regard to the aggregation of the non-marine lower portion of this series of formations, it seems probable that they were begun in the rocky hollows along the whole Atlantic coast from Maine to Cape Hatteras; that rapid currents carried large accumulations of broken stone and the elements of the crystalline rocks many miles out into a shallow sea, which was later barred out by the thick accumulations of these deposits, that thus a series of almost closed sounds was connected with the border of the continent, and that these sounds, extending in a sinuous north-east line, were the places of deposition of all the beds and strata which we now recognize as the Potomac, Albirupean, and the Raritan formations.

It has been my pleasure to read carefully both of Professor Shaler's accounts of Gay Head, and to recognize the many good statements that he has made regarding particular features of the region; but I fail to see that he has given an adequate account of the real structure of the promontory, of its relations to other parts of the island, or of its relations to the similar deposits in Massachusetts, Rhode Island, and Long Island. P. R. UHLER.

Baltimore, Md., Dec. 19.

The Reticulated Structure of Protoplasm.

AFTER I had read the proof of the article on the reticulated structure of human red blood-corpuscles published in *Science* for Sept. 16, 1892, I received a book recently issued in Paris, and entitled "La Cellule Animale, sa Structure et sa Vie, Étude Biologique et Practique, par Joannes Chatin, Professeur adjoint à la Faculté des Sciences de Paris, Chargé du Cours d'Histologie à la Sorbonne, Membre de l'Académie de Médicine." In this delightful treatise, which brings the knowledge of the animal cell to the present time, there are one or two statements in regard to the structure of protoplasm which I should have liked to quote in the paper mentioned, but as that is now impossible, I have asked the editor kindly to allow me to call attention to the following: —

C'est seulement en 1880, à la suite des recherches de Heitzmann, de Fromann et surtout des publications de Hanstein, que l'on commence à modifier la conception générale du protoplasma, pour le considerer, non plus comme une masse indifférente, mais comme une substance structurée.

Cette interprétation recontra une assez vive opposition. Il est des esprits scientifiques qui tiennent à demeurer constamment fidèles aux principes dont ils se sont inspirés dès leurs premières études et qu'ils ne consentent que difficilement à abandonner. . . .

On doit distinguer dans le protoplasma deux parties: l'*hyaloplasma* et le *paraplasma* (Fig. 49).

L'hyaloplasma est une substance fibrillaire, hyaline, réfringente, formant un réseau au milieu d'une substance fluide, moins réfringente, qui est le paraplasma. Qu'on se représente une éponge a travées très tenues et contractiles, plongée dans une substance visqueuse et granulée qui remplirait ses cavités. Cette comparaison donne une idée grossière, mais assez exacte, de la masse protoplasmique prise dans son ensemble.

Elle paraît homogène si les mailles de l'hyaloplasma sont uniformes et qu'on fasse usage d'un faible grossissement. C'est ainsi que le protoplasma avait été étudié durant longtemps, et l'on s'explique d'autant mieux l'erreur dans laquelle on demeurait à l'égard de ses parties constitutives, qu'elles ne se distinguent en général qu'après l'intervention de certains réactifs comme l'acide osmique. Cependent l'histologie zoölogique permet de les observer directement, et j'ai deja eu l'occasion de mentionner à cet égard l'exemple des cellules glandulaires de la Testacelle.

La structure réticulée du protoplasma s'observe dans les cellules amiboïdes comme dans les éléments à forme définie; l'étude des globules sanguins des Invertébrés (Vers, Crustacés, etc.), permet de constater aisément ce fait, d'abord révoqué en doute par des observateurs qui limitaient leurs recherches aux éléments de quelquels animaux supérieurs. ALFRED C. STOKES.

Trenton, New Jersey.

Auroral Displays.

IN answer to Professor Swift's inquiry in *Science* of Dec. 9, I will say that I saw "that memorable spectacle" in the winter of 1834 or 5 when "the snow and the sky suddenly assumed," in the evening, "a bright crimson red." It is one of the most distinct things in my remembrance. I was then well along in my "teens," but had not then undertaken very extensive meteorologic observations and records.

When Dr. Swift speaks of the aurora of July 16 last as "the grandest auroral display of the century," does he take into account the great aurora of August, perhaps, in 1859, when the whole sky was covered with beautifully colored streamers? A fine corona appeared, the display lasted from evening until morning twilight, was repeated less brilliantly during the following night, and with intermediate disturbances of the telegraph lines and of the mag-