accepted that there is a most violent rush of air from under raindrops in a squall. Computation has shown that this cause for the observed wind is purely imaginary, and the air-motion caused by the heaviest possible rainfall is entirely inappreciable. In seeking for an explanation of changes of pressure-distribution, our author, at p. 389, suggests as a cause, "the general circulation of the atmosphere from the hot equator to the cold poles." This statement is hardly borne out by the observations of air-currents.

On the whole, the book is a most admirable and practical exposition of weather-changes, and will repay careful perusal by all interested in the weather and the progress of meteorology.

A Study of the Histological Characters of the Periosteum and Peridental Membrane. By G. V. BLACK. Chicago, W. T. Keener. 8°.

THE contents of this volume appeared in serial form in the *Dental Review*. They include a thorough study of the peridental membrane and its tissue elements, and also of the periosteum, which is so closely related to it. Very little has been written on the subject of the peridental membrane, and until recently there has been very little interest in the subject among dental specialists. Within a short time, however, attention has been directed toward this membrane and its structure, and a great and wide-spread interest has been awakened. There are several reasons for this, among which the following may be mentioned: there is a greater and a more general interest felt now than ever before in the correction of irregularities of the teeth, in which changes in this membrane, and the relation of the parts which it unites, are brought about; and then, too, there is a greater interest manifested by the masses of the dental profession in the retention of pulpless teeth, and roots which have lost their crowns, and which are dependent upon the continued health of the peridental membrane under modified conditions. Another reason which the author advances for the renewed interest in the subject is the revival, under varied forms, of the ancient methods of replanting and transplanting teeth, the success of which is supposed to be dependent, in whole or in part, upon the reconstruction of the peridental membrane, in its re-attachment to the teeth. Dr. Black has made a thorough, and, as it seems to us, an exhaustive study of the subject from an histological standpoint. The illustrations, of which there are sixty-seven, are admirably drawn, and reproduced in a most satisfactory manner. For dentists and those who desire the latest researches into the histology of the periosteum and peridental membrane, this book is invaluable.

The Mind of the Child. Part I. The Senses and the Will. By W. PREYER. Tr. by H. W. Brown. (International Educational Series, Vol. VII.). New York, Appleton. 12°. $1.50.

DR. HARRIS is performing a useful service in the editing of the series of which this work is a volume, and nowhere more so than in the publication of this issue. The work itself is well known, and it will be sufficient to say that it is the very careful and detailed record of the development of Professor Preyer's own child, corroborated by observations from the literature of the topic. The growth of the powers of the senses are studied, and the results controlled by experimental methods. The gradual control of the muscles as the organ of the will is no less carefully pictured, and the work has long been recognized as the most complete contribution to the growing science of 'infant psychology.' The American edition is presented under the most favorable auspices. It is prefaced by an introduction from the pen of Professor Stanley Hall, in which he points out the great educational significance of the work, and demonstrates the practicability of this kind of work in the normal school by a reference to the system in vogue in the Worcester school, of which Mr. E. H. Russel is the principal. Here part of the course in psychology consists in gathering observations of child-life under various rubrics, and studying from this material the psychology of the child-mind. Not only is a valuable material thus gained, but the students are taught to see the meaning of what they are apt to let pass unnoticed, and to enter more intelligently and sympathetically into the thought-habits of the young pupil. The system has been an entire success, many of the normal-school graduates taking such original observations of children as the bases of their graduating theses. The work is creditably translated from the second German edition, and is a very essential contribution to the further spread of useful educational ideas. This is only the first part of Professor Preyer's work. The translation of the second part will soon be ready, and will be anxiously waited for.

Der Tierische Magnetismus (Hypnotismus) und seine Genese. Von JOH. G. SALLIS. Leipzig, 1887. 8°.

De la Suggestion et de ses Applications à la Pedagogie. Par Dr. EDGAR BÉRILLON. Paris, 1888. 8°.

THESE pamphlets are but samples illustrative of the wide-spread interest in the study of hypnotism, that forms so notable a feature of the scientific activity of France, and, to a far less extent, of other European countries. The first of these essays is devoted largely to the historical aspects of the subject; and, in addition to the usual account of Mesmer and his successors, the author brings into connection with hypnotism many of the pseudo-sciences of former centuries, and thus surrounds the history of mesmerism with a suggestive philosophical interpretation. A second leading point in the essay is in the form of a warning as to the dangers of hypnotism, urging that it is a purely technical acquisition, to be used only by experts, and that, above all, is it unsuited for public exhibition by money-making adventurers. The practices of the latter should everywhere (as they have been in many European countries) be forbidden by law. This feeling that Dr. Sallis so forcibly expresses is gaining wider and wider sympathy; and it seems necessary, for the maintenance of the good name that this young science has with difficulty acquired, that it should be placed entirely in the hands of reliable scientists.

Dr. Bérillon's essay contains what at first sight is an alarming proposition: it is nothing less than 'hypnotic moralization.' Unruly, vicious, or lazy children are to be put into the hypnotic condition, and then to have impressed upon them the reformation of their faults. In support of the good that can be thus accomplished, cases are cited in which bad habits of a very perverse type were cured, children backward and sluggish were aroused to a more normal activity, and the benefits thus brought about were shown to be quite permanent. Such a proposition naturally and properly arouses an objection, not only because such an interference with the normal development of the child seems unwarranted, but because we do not as yet know enough of the after-effects of hypnotization to make such an application of what must be a semi-morbid state justifiable. On the other hand, it must be remembered that Dr. Bérillon recommends this treatment only for cases in which ordinary educational means fail, and that it is only to be practised with the consent of the parents and by a skilled physician. He reminds us, too, that many of our reformatory methods interfere with the child's moral freedom, and are equally artificial. We have simply become accustomed to them. He claims, that, if carefully applied, the danger of harmful results is practically *nil*, and has succeeded in gaining the indorsement of several prominent physicians and educators to his plan. It is of course wrong to measure the utility of a project by its liability to abuse; but the abuse is an important factor, and it is at least an open question whether the varied abuses to which the practice here proposed is evidently open does not seriously interfere with its general adoption. The author has at least succeeded in convincing many capable of forming an opinion, that his project is worth a serious consideration.

NOTES AND NEWS.

THE sixteenth annual meeting of the American Public Health Association will be held at Milwaukee, Wis., Nov. 20–23, 1888. The executive committee have selected the following topics for consideration at the meeting: the pollution of water-supplies; the disposal of refuse matter of cities; animal diseases dangerous to man; maritime quarantine, and regulations for the control of contagious and infectious diseases, and their mutual relations. The topics given indicate the subjects which it is desired to consider, yet they are not to be regarded as the exclusive topics of the meeting. Mr. Henry Lomb of Rochester, N.Y., now well known as the originator of the 'Lomb Prize Essays,' offers, through the association, two prizes for the current year, on the following subject: 'Practical Sanitary and

Economic Cooking adapted to Persons of Moderate and Small Means;' first prize to be $500; second prize, $200. All essays written for the above prizes must be in the hands of the secretary, Dr. Irving A. Watson, Concord, N.H., on or before Oct. 15, 1888.

— Dr. William Noyes contributes to the *Journal of Social Science* (No. xxiv.) a convenient summary of the modern view of the criminal type. Taking Lombroso as his guide, he shows in how very many respects the criminal presents abnormal differences, both physical and psychic, from his fellow-men. These differences are to a large extent indicative of a reversal to a more primitive, savage type. It is hopeful to add, that many of the peculiarities can be detected in children, and that the evil results which they forebode can be to a large extent prevented by a properly directed education.

— At the March meeting of the Society of Medical Jurisprudence and State Medicine of New York the best method of executing criminals was discussed. Dr. William A. Hammond advocated strangulation by a silk or cotton rope as the most satisfactory method at command. He criticised the recent report of the State Commission, which recommended the use of electricity, and said that the objections raised against the present method of execution would apply with equal force to any form of execution. Several of the members took exception to Dr. Hammond's statement that strangulation was painless, and Drs. Spitzka and Brill spoke in favor of the guillotine. The society finally adopted, by a nearly unanimous vote, a resolution condemning the bill now before the Legislature, which embodies the recommendations of the State Commission referred to, an abstract of which has already been given in *Science*.

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.*

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

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

Experiments in Vision Again.

SOME time since in *Science* (No. 262) we referred to an experiment which we thought indicated an interesting connection between monocular and binocular vision. We have another to present here which seems in our own experience to possess a similar importance. It is perhaps even more forcible than the first, and may be worth the attention of those interested in visual phenomena.

Take two circles as represented in Fig. 1, and either bend the sheet of paper in the median plane, so that the circles can be made to appear in inclined planes at any desirable angle, or cut the paper so that they may be held at a suitable inclination to each other in planes that will intersect at any given point. The larger the circles, the better will be the effect, the more clearly marked will be the results we have to describe. Now, if we incline the planes of the circles several degrees, it is well known that the retinal impression becomes ovular or elliptical; and the circles also will appear more or less so, when we make allowance for the judgments of experience which can recognize a real circle, although the impression is not identical with it in form. If, then, we combine the circles by convergence at this slight inclination, the central and fused image will retain its slightly elliptical form, although the surface upon which it appears seems a plane vertical to the median plane. The real inclination of the two surfaces does not appear to determine any irregularities in the effect; but binocular agencies, perhaps, balance the two opposing influences from monocular vision so as to present the appearance of a plane. But if we increase the inclination of the two circles and their planes, say each of them to 45° from the horizontal meridian, and cutting the median plane so as to form a right angle with each other, and then combine them by convergence, the effect may be entirely changed. We find that rivalry may take place between the monocular images, and that there is a tendency to see only one of the images at a time, of those belonging to corresponding points. Not only does the circle appear elliptical, but its plane appears in its real inclination to the median plane; that is, the circle seems to lie in the third dimension, with one side nearer the observer than the other, precisely as it ought to appear in case that vision presents the real relations in space of its objects. This effect may alternate from one inclination to the other, showing that there is rivalry between the monocular images for expression in the field of vision. Fatigue may cause this alternation. But the interesting fact to be noted is, that binocular influences no longer avail to make the plane of the fused images lie in plane of the horizontal meridian. The circle seems inclined to this, and is seen in its real space relations, corresponding exactly to the innervation for the individual eye which sees it. If we may ever speak of monocular influences suppressing those of binocular action, we may do so in such cases as these.

We have been able also to obtain more complicated results of the same general kind. This we accomplished by the use of stereoscopic figures, as in Fig. 2. The experiment is performed as before.

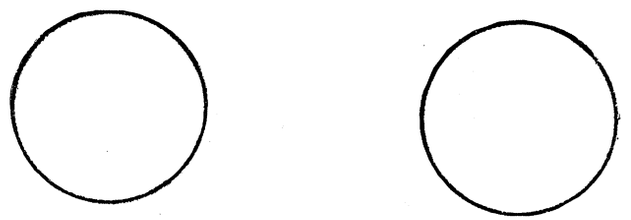

FIG. 1.

If placed at the proper inclination, and combined by convergence, we may notice the inclination of both circles; that is, the monocular images of one concentric set. The same alternation can be observed as before. But by careful practice we have been able to notice the larger circle inclined in one way to the median plane, and the smaller in the opposite way. This makes the planes of the larger and smaller circles of the apparently fused image appear to cut each other at an angle instead of lying in the same plane. This can be explained by supposing that the monocular image of one circle is seen by the right eye, and the monocular image of the other by the left eye. And as each appears to be in the plane in which it really exists, the two must appear to cut each other at an angle. Various alternations may be observed, besides those mentioned in Fig. 1; but they are due merely to the larger number of circles and the different possible relations represented. The results are especially interesting as calling attention to and illustrating the fact that *binocular* disparate points in their visual activity functionate precisely as *monocular* disparate points. This is simply another way of expressing the phenomena of rivalry; for we observe in these, that one area of the right eye may be acting in one way while the corresponding area of the left is inactive, and a disparate area of the left may be acting in another way while the corresponding area in the right is inactive: hence the functional activity of one eye in regard to the larger circle will not prevent the action of the other eye in regard to the smaller circle of Fig. 2. In this case the suppression of one of the binocular images in each case would leave the visual process entirely to monocular functions; and hence, when the inclination of the real planes is great enough to be noticed, it is quite possible that the effect would represent the two circles in different planes cutting each other. It has required much practice, however, to get the results we have described, as the easier tendency, when any inclination of the circles is observed at all, is to per-

FIG. 2.