Scheurlen as defective. From the reports of this meeting it would appear that but few of the leading men of Germany are yet ready to accept Scheurlen's claims as established.

BOOK-REVIEWS.

Lectures on Bacteria. By A. DE BARY. 2d ed. Tr. by Henry E. F. Garnsey and Isaac Bayley Balfour. Oxford, Clarendon Pr. 8°. $5.50.

THIS is an excellent translation of De Bary's 'Vorlesungen ueber Bacterien,' with a considerable number of notes in an appendix. For one who wishes a good readable account of the nature and action of bacteria, not too long or too full of technical details, this moderate-sized and well-arranged volume answers the purpose admirably.

The Children: How to Study Them. By FRANCIS WARNER, M.D. London, Francis Hodgson. 12°.

THIS little volume contains half a dozen lectures, delivered by request of the Froebel Society of London, by Dr. Warner, whose works on the anatomy of movement and on physical expression are widely known. The object of the lectures is to impress upon teachers and parents the necessity and importance of the scientific observation of children. The plea is admirably and emphatically urged. On the practical side there is an attempt to give a number of indications by which the physiological health and growth of children can be observed. Though these are doubtlessly useful, and when made by a skilled observer valuable, yet they are too vaguely stated to be generally applicable. A table of printed questions, with directions as to their use, would be a much safer and more useful compend to put into the hand of the ordinary teacher. Dr. Warner sketches the anatomy of the parts of the body concerned in motion, shows how they are all related to the activity of the brain, and thus become an index of mental strength or weakness, and then describes a series of postures of various parts of the body, and especially of the hand, indicative of various temperaments. He lays stress upon the indications of the nervous type of child with the practical object of teaching such children separately, as we do with the deaf, the blind, and the weak-minded. "Why, then, are the children of slight brain-defect not specially cared for, children tending to become passionate picking up bad habits and practising them, tending to criminality, or, if too feeble for that, to pauperism? . . . Now, my argument is, that we can discover such children and pick them out in a school by definite physical signs; we can point out the children not up to the average, and tending to failure from want of brain-power." This series of lectures adds to the number of indications of the time when we shall have definite knowledge of the physical and mental traits of children by which their healthy education may be guided, and their evil tendencies avoided.

Annual Report of the Geological Survey of Pennsylvania for 1886. Parts I. and II. Harrisburg, Geol. Surv. 8°.

ALTHOUGH Professor Lesley's staff is now quite small, this report adds four volumes to the imposing series already published by the Second Geological Survey of Pennsylvania. Many of these numerous volumes, although possessing a local interest and value as aids in economic developments, are, from the scientific point of view, simply masses of facts awaiting generalization; and it is to be hoped that the long-promised final report which is to co-ordinate these multitudinous data will soon begin to appear.

Only the first two volumes of the report for 1886 have been received. These are crowded with details of the development and production of coal, oil, and gas, but are rather deficient in features of more than local interest not previously published; and, since the data are largely of a statistical nature, even their local value must be diminished by tardy publication.

The first volume contains the report, by Mr. E. V. d'Invilliers, on the re-survey of the Pittsburg coal-region. It is largely a summary, in one volume, of the surveys made a decade since by Professor Stevenson, Mr. White, and others. It is accompanied, however, by a new geological map of south-western Pennsylvania. Special attention is given to the principal commercial coal of the region, — the great Pittsburg bed. Its outcrop is determined horizontally and vertically more accurately than ever before; and the historical and statistical facts bearing upon its development, the structural lines affecting its position for mining; the stratigraphical features of the coal-measure systems above and below it; and the methods most in use for mining and transporting its product to market, — are exhibited in all desirable fulness and detail. It is easy to see that this report must prove of great practical utility to the coal-operators of the region; and the elevations above tide of the outcrop of the Pittsburg coal-bed will be useful to oil and gas prospectors in giving them a basis from which to estimate the depth to be drilled in order to reach the geological horizons of the different oil and gas sands.

This report is supplemented by two important contributions on Pennsylvania bituminous coal mining by Mr. A. N. Humphreys and Mr. Selwyn Taylor, and is also accompanied by a memoir by the eminent and venerable paleo-botanist, Leo Lesquereux, on the character and distribution of paleozoic plants.

The second volume consists chiefly of Mr. Carll's report on the oil and gas regions. The history of development is the most complete yet published, and gives the reader a good general idea of the successive steps by which the petroleum industry has advanced from the primitive skimming of an oil-spring with a piece of bark and the restricted use of the material to medicinal purposes, to the drilling of wells three thousand feet deep, the pumping of oil over mountain and valley to the seaboard, and the flooding of the world with an inexpensive illuminant. The ancient pits or shallow wells which are found all over the oil-region, and which were undoubtedly dug to obtain oil, are discussed at some length; and the conclusion is reached that these early oil operations are due, not to the Indians, or French, or early white settlers, but to some primitive dwellers on the soil, who have long since passed away.

Short chapters on the geographic and topographic distribution of oil and gas, on the structure and stratigraphy of the productive horizons, and on the developments during 1886, are followed by a long and monotonous series of well-records, which constitute the principal part of the report. The volume concludes with a memoir on the chemical composition of natural gas by Professor Phillips, and the extended bibliography of petroleum.

Unfinished Worlds: a Study in Astronomy. By S. H. PARKES. New York, Pott. 12°. $1.50.

THIS book is intended for general readers, especially those in early life, whose ideas of the province and achievements of science are generally in excess of the sober teachings of actual experience. In this we quote from the author, and, while we are ready to agree with him to a large extent, yet we feel that just as the knowledge of Columbus seemed wonderful and awe-inspiring to his crews when he predicted the coming of an eclipse, so to us appear startling the little scraps of information our new instruments are giving us of the constitution of the celestial bodies. The old astronomy busied itself with the movements, the new astronomy with the physical constitution, of the sun, the stars, the planets, and comets. While it is true that for many of us the interest in the old astronomy began to wane, the results already achieved in this new field are so novel that we may be pardoned if we are apt to exaggerate their magnitude. Mr. Parkes's book has for its main purpose the bringing-out clearly of the changing nature of the bodies filling space, and sketches the information we have of nebulæ, stars, the sun, the earth, the planets, and comets. All this is well done. The book closes with a *résumé* of the different cosmic theories.

NOTES AND NEWS.

THE January number of the *Revue Philosophique*, edited by Felix Alcan, contains articles by A. Espinas on the mental evolution of animals, by F. Paulhan on associationalism and psychical synthesis, and by Adam on Pascal and Descartes. Besides this, reviews and *résumés* of new publications are given.

— Prof. J. J. Egli of Zurich, Switzerland, who writes the biennial reports of new researches on geographical names for Wagner's annual report on the progress of geography, publishes a circular letter in which he requests authors and publishers to send him copies, or, when such is not possible, titles, of publications and of notes or papers in journals or books referring to the subject of geo-

graphical names, their meaning, origin, derivation, etc. As it is desirable that the annual reports should be as complete as possible, and as a large amount of material is scattered through American journals, and particularly through the publications of the State surveys and historical societies, which are difficult of access in Europe, American authors can materially help Professor Egli by sending him copies, or at least the titles, of their remarks bearing on this subject.

— Last autumn an attempt was made, says *Nature*, to bring live cod from Iceland to Norway on board smacks, and six thousand fish were brought over to Bergen successfully. Here, however, many of them died, on account of the basin in which they were kept until the sale could be effected being too small. This year fresh attempts will be made.

— Dr. Asa Gray has been seriously ill for some weeks.

— The second meeting of the International Copyright Association was held in Boston, Jan. 24, President Eliot in the chair. Secretary Estes announced that satisfactory progress had been made in the movement to obtain the recognition of authors' rights in their literary work. A resolution was adopted approving the principle involved in the amendments of the Chase Copyright Bill proposed by the executive committee of the American Copyright League and the American Publishers' Copyright League, and requesting Senator Chase to adopt these amendments, with such verbal changes as may be recommended by the council of this association and adopted by the committees mentioned. A resolution was also passed asking the chairman to appoint a sub-committee to confer with Senator Chase regarding these amendments. After a general discussion, in which Messrs. Houghton, Scudder, Ticknor, Ernst Lothrop, and others participated, the meeting adjourned.

— *Nature* comments on French architects as seeming to attend to the decorative rather than the useful parts of the buildings they design. The architect who designed the new medical school in Paris took so little pains about the distribution of the water-pipes, that in very cold weather the laboratories (chemistry, physiology, bacteriology, experimental pathology, etc.) are wholly deprived of water. Recently the water in all the pipes was frozen, so that not a drop of water was available in a single laboratory. Of course, every one connected with the school complains that work under such conditions is nearly impossible. The new Sorbonne will be a handsome building, but, unfortunately, the work is soon to be stopped owing to lack of money. The ornamental part of the building is finished, but the useful part has not yet been begun.

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.

The Snow-Snake.

IN a letter (*Science*, xi. No. 259) pointing out certain errors in an article on Pocahontas, referring especially to two games mentioned therein, Dr. Beauchamp says, "The children indoors were playing at *gus-ha'-eh* (or 'peach-pits'), it is said; but where the peaches came from at that early day is not explained." Yet the doctor fails to give us a hint as to the true rendering of this word, and the proper name of this game. This game was played generally with 'plum-pits,' though sometimes with small pebbles, etc.; but, as the pits were more convenient and symmetrical, they were preferred, and, being used in most cases, they gave their name to the game, namely, 'plum-pits,' or, better, 'pit-betting.'

In regard to the use of the snow-snake among Powhatanic tribes, Dr. Beauchamp remarks that "it is not wise to place a Northern game so far South," evidently wholly oblivious of the fact that 'betting' with the *u-tră-hwĕⁿ'-uĕ* ('snow-snake') was a favorite outdoor sport of the Carolinian and Virginian tribes of Iroquois, — too important offshoots of the family to be overlooked, — and who were situated farther South than the Powhatans. The doctor should have omitted the *r* in his orthography of the word *kă-wher'-ta* (*kă-whe'-ta*), as it does not occur in the speech of the Onondagas of the present time. J. N. B. HEWITT.

Washington, D.C., Jan. 23.

The 'Act of God' Once More.

MR. W. W. Nevin's interesting note (*Science*, Dec. 2) as to the Mexican doctrine of 'fuerza mayor' emphasizes my point. The Roman law having always been, as it still is, the law of continental Europe, it was inevitable that such American colonies as were settled from the continent should retain the doctrine of the 'act of God,' and that when the Spanish brought it to Mexico, and implanted it in a community saturated with superstition, it should have augmented quite as rapidly as its adumbration has waned with us, until even so anticipated an occurrence as the flooding of a river in a rainy season should relieve from the obligation of a contract. But United States capital and energy are speedily civilizing Mexico by building railroads within her territory, and doubtless we may expect a very considerable attenuation of the doctrine at no distant day. I do not think all of *Science's* correspondents share in the good faith of Mr. Nevin. It does not impress me, for example, as in good faith that one of them asks (*Science*, Nov. 25) whether, had a certain car-stove he specifies upset and ignited a certain train, it would have been an 'act of God;' or that another (*Science*, Dec. 16) demands whether I propose that the railways of this Republic be operated by Mexican law. But in good faith, nevertheless, will I answer both these questions. Up to the date of the latest of the five accidents I specified, no practicable means of heating cars had been invented except car-stoves. Steam-pipes from the engine had, indeed, been proposed for twenty years, but no coupler-joint had been perfected, and no means of keeping the steam from cooling, sufficient to overcome the extreme coolable surface of a pipe serving long trains in the severe weather of the mountains, or the low temperatures of the North and North-west, devised. At present, however (stimulated, in fact, by the very casualties I specified at Republic and White River), there are certainly three or four of these contrivances which have been tested and found practicable. Therefore, had your correspondent's stove overturned and partially roasted him, he would certainly have been deprived of the opportunity of asserting that he had been roasted by an 'act of God,' since the company could have availed itself of that particular progress of applied science which had invented a heating apparatus which in case of accidents would not induce combustion of the train. As to the second question, I say, No, and Yes. I proposed no Mexican laws for regulation of our own railroads, but I did question whether an already well-known rule of law limiting the responsibility of the employer for mental conditions of the employee was entirely without bearing upon a certain state of admitted facts. The common law expressly declares that there are possible conditions of an employee's mind which discharge the employer. An employee who, in ejecting trespassers, becomes vindictive, passionate, or wilful, and on that account employs a surplusage of force, so acts at his own and not at his employer's peril. I therefore suggested a question whether an entirely unforeseen and instantaneous absence of mind on an employee's part was any more within his employer's control than a burst of passion.

Again: it seems immaterial to my point that different investigators, tribunals, or commissions may receive different reports of the causes directly forwarding a casualty. A question of precedence between parallel proximate causes is always an exceedingly nice one. Indeed, the only report of a railway accident likely to be substantially unreliable is the newspaper report; and this not necessarily because the newspaper is biassed against the company, but simply because newspapers are at the mercy of their reporters, precisely as railway companies are at the mercy of their employees. The reporter first on the ground takes the impressions of the bystanders, and reconciles them somehow out of his inner consciousness. The only persons present who possess the slightest actual knowledge as to the why and wherefore of the catastrophe are the employees of the company, and they are silent. They have their