SCIENCE.

FRIDAY, JANUARY 18, 1884.

COMMENT AND CRITICISM.

THE Philadelphia local committee for the reception of the American and British associations for the advancement of science, which will meet in that city on the 3d of next September, is taking active steps to make the meeting a memorable one. The well-known hospitality of Philadelphia, together with the unusual attractions offered by the combined meeting of the two great scientific bodies, will undoubtedly secure a very large attendance. Under the auspices of the Franklin institute, an international electrical exhibition will be opened simultaneously with the meeting of the associations, and a congress of electricians will at the same time be convened. Excursions of unusual interest and extent are being planned. Hon. John Welsh is president, and Prof. H. Carvill Lewis and Dr. E. J. Nolan secretaries, of the local committee, which consists of a hundred and fifty of the most influential citizens, representing all the prominent institutions of the city. Communications for the local committee should be addressed to its headquarters, — the Academy of natural sciences. The meeting will probably be held in the buildings of the University of Pennsylvania, which have been offered for that purpose.

It is sincerely to be hoped that the local committee at Montreal will take no steps which, by excursions or otherwise, may prevent a full attendance at Philadelphia of members of the British association. The committees at Montreal and Philadelphia should work harmoniously, arranging for combined excursions at the close of the Philadelphia meeting. With the aid of the Montreal committee, the Philadelphia meeting can be made the most important scientific gathering that has ever been held in this country.

MR. THEODORE LINK, in the *Naturalist* for December, pleads forcibly for the betterment of zoölogical gardens. These ordinarily are, indeed, to speak paradoxically, nothing but stationary travelling-shows, — Barnum's menageries called to a halt. What is required for the animals' happiness and health is obvious enough; but, as questions like the present are generally decided from man's point of view, let us shift to that. The mission of these gardens, as Mr. Link says, is ostensibly "the study and dissemination of a knowledge of the natural habits of the animal kingdom." Therefore an opportunity for such habits among these animals is essential to the student visiting them. Perhaps most visitors, however, go for amusement, or for the pleasure of easy instruction. We go to see something opposite to the restraints of our own civilization, to behold the wonders of untrammelled instincts, to enjoy the beauties of free motion. But as it is, we seek a pleasure-garden, and find it a prison. We find no animated vigor there to cheer and to excite us, but helpless misery too much like the poorer side of human life.

The great difficulty, it seems to us, is in attempting with limited means too big and miscellaneous collections, imperfect, unsatisfactory, and uninstructive, about in proportion to their excess of size. Would it not be better in a given half-acre to have a single pair of lions, or of any other much admired brute, rather than a subdued camel, a cramped tiger, a dilapidated ostrich, and a discouraged crocodile, all obliged to stand as nearly as possible on one leg, for want of any thing better to do? Any chance and inducement given to the animals to breed naturally and freely, certainly might be a direct and valuable economy to any zoölogical society in keeping up its stock.

ACCORDING to a communication made to the London section of the Society of chemical in-

dustry by Mr. Weldon, it does not seem that we are much nearer to cheap aluminium than we have been for a long time. A short time since, it was announced that a new method of production had been invented and was in use; but Mr. Weldon says this invention only relates to the production of anhydrous alumina from potash alum; and, if the method of obtaining this were fifty per cent cheaper than that of M. Pechiney of Salindres, it would only cheapen aluminium by five per cent.

APROPOS of the present discussion of the excessive requirements of Greek and Latin in our colleges, let us not forget the neglect of English. One of the reasons most commonly given for the study of the ancient languages is that they aid the understanding of our own. This is undoubtedly true, but they are not the best aids; and if a good understanding of English be the desired end, as it certainly should be, there can be no question that it will be sooner and better attained by the study of English itself. The derivation of our words can be very satisfactorily taught along with advanced spelling, and the meaning of a large number of roots, prefixes, and suffixes, can then be acquired, so as to give most practical assistance to the comprehension of English; much better, we venture to say, than if etymological study be limited to the languages from which the roots, prefixes, and suffixes come, and direct statement of their use in building up our own language be omitted. It is certainly very common to find students who have 'passed' in Greek and Latin still unable to explain the meaning of not unusual scientific terms. Indeed, so large a share of the time allowed to linguistic study is now given to Greek and Latin considered simply as dead languages, without reference to their living descendants, that no time is left in which the general student can learn what he certainly should know about his mother-tongue.

There is pressing need of collegiate study of English as a language: and few subjects would be more attractive than this might be made by a lecturer who would tell his class where and when the language attained enough of its present characteristics to be entitled to its present name, what were its ancestors, and how they mingled and changed their form in producing their descendant; who would describe how the language itself has varied in recent centuries, and how its unsystematic spelling, so unlike the phonetic simplicity of Italian and Spanish, depends on its complex origin; who would point out the historic reasons for its *dependence* on earlier languages for words expressing abstract ideas, in contrast with the relative *unabhängigkeit* of German. All this would no more require a knowledge of ancient or foreign languages than an appreciation of elementary lectures on chemistry needs an understanding of organic analysis; but it would give a very different knowledge of English from that derived from the study of Latin declensions and Greek accents. We cannot doubt that it would be of great service to all who have to write out what they think, and that it would attract to philological studies many students who are now repelled from them.

WE understand that the scientific work of the Army signal-office is likely to form a feature of increasing importance in the future development of that department, and that Gen. Hazen desires to secure the services of the best talent in the country. It would seem that the study of mathematics, mechanics, and physics, as bearing on meteorology, has been sadly neglected in our universities; and it is by no means easy to find any who have been studying the sciences with a view to the pursuit of investigations in meteorology. As a general rule, those who have studied and practised astronomy for a few years are the best prepared to advance meteorology. The fine library of the signal-office, its unequalled mass of observations and maps, its courses of lectures, its annual classes of men under instruction at Fort Myer, its collection of apparatus, all offer to young meteorologists opportunity and stimulus to farther advancement; while the publications of the office offer every facility for making known the results of origi-

nal investigations. Even meteorologists outside the office, or employed by it as consulting specialists, may find it to their advantage to avail themselves of this opportunity for publication. Considering the great future evidently in store for meteorology, it is not surprising that Professor Abbe is, as we understand, diligently inquiring for those who are willing to come to his assistance in the effort to develop a systematic, deductive, and exact science of meteorology. We commend this subject to those whose studies have taken this direction. There are needed the investigator, the teacher, and the expert consulting-meteorologist, precisely as in other branches of 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.*

Chemical geology.

IT appears to me, that in his interesting communication in the number of *Science* for Dec. 28, Professor Winchell has fallen into an error, which, while diminishing by more than one-eighth his estimate of the secular increase of the earth's mass, is yet more serious from the stand-point of chemical geology. In determining the amount of carbon dioxide abstracted from the atmosphere and fixed in the earth's crust, he estimates, first, that represented by the carbonate rocks (limestone, dolomite, etc.), and, second, that required for the decomposition of an assumed thickness of decomposable silicate rocks; and both these amounts are included in his grand total. But this is certainly bad book-keeping, for a portion of the carbon dioxide is counted twice. The decay of the silicate rocks is a necessary antecedent of the formation of the carbonate rocks; and the carbon dioxide of the latter is precisely the same as that which has previously decomposed the former. In general terms, this grandest of all chemical processes proceeds as follows: the carbon dioxide of the atmosphere decomposes the felspars, hornblende, augite, micas, etc., of the silicate rocks, leaving the alumina and iron with the silica as a more or less ferruginous kaoline, and forming carbonates of the alkalies and alkaline earths, which are carried away in solution, and ultimately reach the sea, where the latter are deposited as limestone and dolomite, and the former react with the calcium and magnesium chlorides of the seawater, producing alkaline chlorides (chiefly common salt) and more limestone and dolomite. As Dr. Hunt has so clearly shown, the kaoline on the land, and salt in the sea, are merely incidental results of the fixation of the carbon dioxide of the atmosphere in the carbonate rocks. W. O. CROSBY.

Osteology of the cormorant.

Dr. Shufeldt's letter in *Science* (ii. 822) calls for a few remarks. In relation to his first statement, that 'the occipital style of the cormorant is not an ossification in the tendon of any muscle' of the neck, Selenka wrote as follows: "Eigenthümlich ist dem Carbo cormoranus und C. graculus, aber auch nur diesen beiden, ein an dem *occip. superius* durch bandmasse verbundener, dreieckig pyramidenförmiger, nach hinten gerichteter knochen, welcher die ansatzfläche der den kopf bewegenden muskeln soz. vergrössert; er ist ein sehnenknochen und gehört nicht zum schädel" (Thierreichs, 19). In view of such eminent authority, it would seem that something more than simple denial is required to upset a statement accepted by anatomists for many years. It is worthy of note that Dr. Shufeldt does not mention the nature of the bone in his article, and that, in ignoring the point to which I took exception, he virtually acknowledges his mistake. It is difficult to understand how one who does not know the position of a bone is qualified to expound its nature; and in all cases it is wise, if we would convince, to give reasons for dissent from authorities.

As to his second statement, that my ideas of the morphology of the rotular process are wrong, I would simply remark that the ideas referred to are not mine, but those of Nitzsch, of Meckel, of Tiedemann, of Owen, of Selenka, and of Mivart, and suggest that it would be appropriate to read such eminent authorities before disposing of them with an empirical denial. Dr. Shufeldt's paper clearly intimates that the rotular process of the divers is the homologue of the patella in other birds. The coexistence of the two disproves this by *reductio ad absurdum*. I would invite Dr. Shufeldt to quote the passage to which he refers when citing Owen as considering any process of the tibia as the analogue of the patella.

Lastly, Dr. Shufeldt states "that, furthermore, I find myself misquoted more than once." I would remind Dr. Shufeldt that I quoted him but once; and of the accuracy of this, any one may satisfy himself by referring to *Science*, ii. 642, 2d column, line 19.

J. AMORY JEFFRIES.

Electric time-signals.

Your correspondent who describes his method of making electrical signals in a recent number of *Science* (ii. 823) can greatly simplify and thereby improve his arrangement by inserting within the clock a couple of thin metallic springs with platinum contacts, the circuit being completed by the pressure of the hammer on the 'outward stroke.' The writer has had such an attachment to an ordinary 'programme clock' in constant use for about ten years, as is doubtless the case with many others who have had occasion to distribute time. The signals are transmitted to several buildings, in one of which an electric gong is struck, and in others a number of 'vibrating' bells are rung.

Mercury contacts are generally troublesome. The arrangement described seems unnecessarily complicated: besides, it is difficult to see the necessity for insulating the clock 'on a square of plate glass.'

M.

Columbus, O.

Capitalization of names of formations.

The use of capitals is a literary rather than a scientific matter; but geologists, nevertheless, suffer as a class from the existing confusion in regard to the names of formations.

Authors who are consistent with themselves in this matter fall into three classes. Those of the first class speak of the *P*otsdam, and of the *C*arboniferous, but of *p*otsdam strata and *c*arboniferous strata. In so doing they class the names of formations as proper nouns, but refuse to recognize proper adjectives. This practice employs a German idiom not otherwise countenanced in our language: we do not say *g*erman