

enough worse material. Such a definition, if adopted, would be "calculated to facilitate the work of the unfortunate public analysts who may be called upon to express an opinion as to the genuineness of a sample of brandy," and the question, what is brandy? analytically speaking, would no longer "await solution." Recent analyses to which you refer have at any rate reduced a large section of the brandy trade to the confession that much of the stuff they sold never had its origin in the grape at all. The public house trade now posts notices in the bars that it cannot guarantee the brandy sold to be genuine grape spirit.

The attitude of the French committee is not difficult to understand, and there can be no objection to it so long as the trade, in the interests of which it has undertaken the inquiry, determines on issuing an honest label setting forth that either the spirit is a pot still spirit from grape wine or it is not.

Bromley, Kent, November 8.

S. ARCH. VASEY.

The Origin of Life.

ALTHOUGH there are good reasons for believing that the life of our world is the product of its own physical conditions, and distinct from the life of other members of the solar system, it is hardly probable that living substance can be produced otherwise than by the same conditions that produced it in the past, and one of these conditions is a vast period of time.

We are not acquainted with any life apart from "cells." But the cell is a very complex organism, and between inorganic substance and the cell there may have been as long a course of evolution as between the cell and the highest existing animal or vegetable. Probably most biologists nowadays regard life not as an entity (*e.g.* not as a "vital force"), but rather as a coordination of many physical processes which have become more numerous and better coordinated in the course of evolution. It is not to be supposed that the *total* functions of life would be developed in not-living substances under the restricted conditions of human experiment; nevertheless, some of the *individual* functions might be brought into action, at least in a primitive form.

One of these functions, which I believe to be the most fundamental, is the deoxidation of a compound containing the elements N, O, C, H, &c., by the action of light, moderate heat, or slight electrical disturbance. This is the foundation of biosynthesis—a small beginning which in the course of ages develops mechanisms so perfect as the photosynthesis in chlorophyll-bearing cells. We ought by research to discover the conditions on which such deoxidation depends, and imitate it in our laboratories; we might even apply it to important economic purposes.

This deoxidation is probably a perfectly natural process, as natural as the opposite process of oxidation, only it must not be sought in the behaviour of mere oxides, as CO₂, but rather in that of compounds containing N, O, C, H, &c., as above suggested. In fact, it may be expected to be nearly a reversal of the process of vital oxidation, which has been more successfully investigated. Vital oxidation seems to take place in two stages, as follows:—(1) the O is taken into combination with the N in a complex molecule, (2) it is transferred from the N to a more oxidisable element. Whether complete linking occurs between O and N, as O=N≡, we cannot say; but the linkings ≡C—O—N≡ and H—O—N≡ are probable. The oxygen-carrying function of N seems to be assisted in many (if not all) cases by Fe.

First attempts at life may be occurring continually around us, but if any synthetic substances be formed they are sure to be seized and assimilated by the already developed organisms.

F. J. ALLEN.

Cambridge, November 12.

Change in the Colour of Moss Agates.

IN connection with Mr. Whitton's inquiry (*NATURE*, November 10, p. 31), the following note may be of interest.

On the top of the West Cliff at Bournemouth the road is laid with material which includes a number of flint pebbles. These are, as a rule, rounded or subangular, and of a yellow or whitish-yellow colour as regards their general surface. But where exposed to the air the colour has

changed to deep blue, violet, or purple, and so much so that in places the whole surface of the road has a marked blue shimmer. Or perhaps it should rather be said that this was the case last autumn; I have not seen it since.

As will be seen from the enclosed specimen, the contrast between the imbedded and the exposed portion of the pebbles is very striking.

Without giving any special study to the matter, I was inclined at the time to attribute the phenomenon either to a further oxidation and hydration of the iron which is, no doubt, present in the flints, or, possibly, to a molecular rearrangement of the silica. At some points the blue colour passes almost into black; this suggests that it may indicate a transition stage between yellow and black flints.

Possibly some mineralogist has examined the matter more thoroughly.

C. SIMMONDS.

Northcroft, Deronda Road, Herne Hill, November 14.

Chemical Analysis for Beginners

IN a review on this subject (this vol., p. 5) "J. B. C." directs attention once again to the unsuitability of an extended study of analysis for a beginner. His opinions not only claim respect, but must be largely shared by all teachers of chemistry.

There is, however, a side to the question which somehow seems rather to be overlooked. The average elementary student will work patiently for hours over qualitative analysis, well taught, badly taught, or not taught at all—he is interested, and though none too willing to use brains as well as tables, he is ready under guidance to do his best. But in any logical system of elementary quantitative and preparation work calculated to build up a firm foundation in the principles of chemistry he appears to take no *natural* interest, when it comes to actual work. Possibly "J. B. C." will not agree that this is so; and it may be right that the student should be compelled (if it can be done) to think logically from the first. But it seems not unimportant to interest him in practice as well as "on paper."

I do not refer to the embryo professional chemist who soon gets through the introductory work and is nearly always interested, but to that enormous crowd of text-book consumers who spend, possibly, three hours per week in the chemical laboratory as part of their scheme of study. Does not the marked change of attitude in such students when qualitative analysis is touched upon indicate that there is still room for fundamental improvement in the method of presenting first steps in practical chemistry?

F. SOUTHERDEN.

Royal Albert Memorial College, Exeter.

Misuse of Words and Phrases.

IN Mr. Basset's book, to which he refers in *NATURE* of November 10 (p. 30), he speaks of the advantage of having "a concise and pointed mode of expression, which saves a great deal of circumlocution and verbosity." He thinks that this object is best gained by coining a new word from the Greek, for instance, *autotomic*, whereas I hold that the same object is better gained by adopting a word of English derivation, *self-cutting*. Mr. Basset now says that he considers this word "inelegant," and, in the absence of any standard of elegance, I can only reply that this is a matter of individual taste. Perhaps it would be better still to call a curve that has double points a "nodal curve," and one that has none a "nodeless curve." The word *binodal* is already in use.

As regards the phrase "non-singular cubic," it is clearly inaccurate if, with Plücker, we speak of "singular lines" as well as "singular points," and include all these under the term singularities; but I rather think that in English books the term singularity was formerly not applied to double tangents, or even to points of inflection.

November 14.

T. B. S.

Reason in Dogs.

APROPOS of "thinking cats," perhaps the following story of a practical joke played by a dog will interest your readers.

A friend of mine, Mr. W., owns a Manchester terrier of which he is very fond, and for that reason receives rather more than doggy attention. The dog passes most of his time in the library, where a basket and rug are provided for him, but he prefers, when it is possible, to take possession

of his master's easy chair. A short time ago I had occasion to call on Mr. W., and the dog was, as usual, occupying the chair, from which he was removed to his basket. He showed his resentment of this disturbance of his slumbers by becoming very restless. Presently he trotted over to the door, which he rattled by pushing with his nose, his usual method of attracting attention when he wished to go out. His master immediately rose and opened the door, but instead of the dog going out he rushed back and jumped into the chair his master had just vacated! The rapid wagging of his tail and the expression on his face showed the dog to be very pleased with the result of his ruse. The dog has repeated the same joke once or twice since, with much evident delight to himself.

ARTHUR J. HAWKES.

Bournemouth.

Occurrence of a Tropical Form of Stick-Insect in Devonshire.

A FEW weeks ago I obtained through the kindness of a lady in Paignton a living specimen of a stick-insect, one of several individuals which had appeared in her garden. My example was met with on the plaster outside a window, and owing to the tenacity with which it adhered to its position required some force to dislodge it. I preserved it in captivity for about a fortnight, at the close of which period it died, having refused to feed on the foliage of any of the plants with which it was supplied.

It is an apterous female, and is, I think, referable to *Cladoxerus phyllinus*, Gray. I have not been able to obtain any clue as to the cause of its occurrence.

ROBERT O. CUNNINGHAM.

A Probable Variable of the Algol Type.

ON the evening of October 29, while examining the Pleiades with a binocular at about 9 p.m., G.M.T., I noticed that the star Atlas (27 Tauri) was slightly *fainter* than Pleione (28 Tauri), a little to the north of it. I did not remember at the time what the relative brightness of the stars was, and on looking them up in the Harvard Catalogues I was surprised to find that Atlas was measured 3.80 magnitude, and Pleione 5.19. I find that all the estimates for the last 300 years agree in making Atlas considerably brighter than Pleione. The nights following October 29 were cloudy, but on the evening of November 9 I found Atlas of its usual brilliancy, and more than 1 magnitude brighter than Pleione. The observed variation was therefore about $1\frac{1}{2}$ magnitude. As Atlas is not a long period variable, it seems probable that it is a variable of the Algol type. The star should be watched, and observations for variable radial velocity would be very desirable.

J. E. GORE.

THE PREVIOUS EXAMINATION AT CAMBRIDGE.

THE first report of the studies and examinations syndicate, issued on November 11, deals with the previous examination. This is the first public test imposed on candidates for degrees at the university, and since 1822 has included a compulsory examination in both Latin and Greek. In response to a demand for reform sent up by teachers, parents, professional men, and men of science in the direction of making Greek, at least for some students, an optional subject—a demand supported by a large majority of head-masters and assistant masters in the secondary schools—the syndicate proposes a new scheme for the examination in which this demand is recognised.

Briefly, the scheme provides that for all candidates the "previous" shall consist of three parts, to be taken together or separately at the convenience of the student. Part i. includes Latin, Greek, French, and German, the papers in each to require unprepared translation and composition. "Set books" are abolished. A candidate may take Latin and Greek, or either Latin or Greek together with French or German. In other words, he must take *two* languages,

of which one at least is an ancient classical language. Part ii. includes arithmetic, algebra, and geometry as heretofore. The paper on "Paley's Evidences" is abolished; it is not a school subject, and it is got up largely by an effort of memory from a bare abstract or analysis. Part iii. includes English composition as a compulsory subject, and two of the following alternatives: (1) English history; (2) scripture knowledge (a Gospel and Acts in English); (3) elementary organic chemistry; (4) experimental mechanics and other parts of elementary physics. Natural science, in the shape of physics and chemistry, is thus introduced for the first time. The syndicate was urged by weighty authorities to require from all candidates some knowledge of science; but, after full consideration, it is unable to recommend more than the inclusion of science among the alternative subjects. Probably, in view of the imperfect organisation of science teaching in many public schools of the classical type, to make science compulsory at this stage would have involved the adoption of a standard so low as in effect to discredit the subject.

For the benefit of certain students, among whom students of science may certainly be reckoned, to whom the power to read French and German is more important than a special knowledge of one only of these, it is provided that the translation papers in each of the two languages may be substituted for the translation and composition papers in one alone.

For a boy from a modern school or technical institute, therefore, the examination provided might thus include, for example, Latin, French, and German translation, mathematics, English composition, elementary chemistry, and elementary physics. On the other hand, a boy from a purely classical school might take the following combination: Latin and Greek, mathematics, English composition, scripture, and English history. For him the examination would be an improvement on the old "previous" examination, not only by reason of the higher standard proposed to be required, but also on account of the wider range of literary subjects to be included.

The report represents a serious attempt to recognise and to provide for the changes which are in progress in modern English education. By asking from every aspirant evidence that he has seriously studied *one*, at least, of the classical languages, it safeguards the traditional virtue ascribed to that form of intellectual training. By admitting that modern languages (including English) and physical science are possible components of a liberal education in the twentieth century, it indicates a certain widening of academic aims and ideals that may lead to better things hereafter. There is little doubt that the report will meet with strenuous opposition from those who, in the supposed interest of ancient learning, dare not make any concession to modern knowledge. It will not escape criticism from reformers of the more advanced type, who would sweep away Latin as well as Greek. But the proposals at least remedy a genuine grievance in a practical manner, and they make for progress along the lines of a sounder and broader education than the older universities have yet sought to foster.

THE EXPLORATION OF THE TRANSVAAL.¹

IN this first report, drawn up by Mr. H. Kynaston and his colleagues, we see the prospect of healthy rivalry between the geologists of Cape Colony and of the newly acquired territories to the north. No time has been lost in issuing one of those small folio

¹ "Geological Survey of the Transvaal. Report for the Year 1903." Pp. ii+48; with 24 plates, folding maps, and sections. (Pretoria: Printed at the Government Printing Office, 1904.)