laws of elasticity break down long before breaking takes place, it is not surprising that he should find himself in disagreement with the results of theoretical elasticity.

A summary of the author's theory is given on p. 31, in the shape of ten hypotheses, most of which are of general acceptance, except perhaps number 8, which asserts that "The algebraic sum of the direct forces of compression and extension can never become zero;" while number 4 is redundant, and opposed to the principles of elementary statics.

After the length of time the theory of the beam has been worked at, it is natural to expect the treatment to have fallen into a conventional groove; but there is an unfamiliar appearance about the present pages, which makes it difficult to find out where the originality claimed by the author for his theory comes in; while many of his statements about the position of the neutral line (p. 27) "at the inception of the loading being at the bottom or extended side of the beam, and moved upwards by reason of the deflection and equally with it," are in direct opposition to the careful observations of Mr. W. H. Barlow.

A great many additional pages, reaching to number 166, are devoted to applications to beams of different materials, cast-iron, wrought-iron and steel, and timber; but the method is the same throughout, so that the essence of the book would go into very few pages. The treatise is a great contrast in this respect to most recent American publications on practical subjects.

A. G. G.

Chambers's Encyclopædia. New Edition. Vol. V. (London and Edinburgh: W. and R. Chambers, 1890.)

THE new volume of the present edition of "Chambers's Encyclopædia" deserves in all respects as cordial a reception as that which has been given to the preceding volumes. The editor has done his work with admirable care, selecting for the various subjects writers competent to deal with them, and setting apart for each subject, as nearly as possible, the space that properly belongs to it in accordance with the scheme of the work as a whole. Of the strictly scientific contributions, we need only say that those of them we have been able to examine are sound and concise. With regard to the articles on geology and heat, it may be enough to mention that the latter is by Prof. Tait, the former by Prof. James Geikie, to whom also have been intrusted the articles on the Glacial period and the geology of Great Britain. The climate of Great Britain is the subject of a short but luminous paper by Dr. Buchan. An excellent account of gas and gas-lighting is given by Dr. Alfred Daniell, and Prof. Ewing describes the gas-engine. Mr. Keltie contributes an interesting paper on geography, and Dr. J. S. Mackay writes with his usual clearness on geometry. Mr. F. Hindes Groome's article on the gypsies may be noted as a capital summary of many curious facts and theories. Mr. J. Arthur Thomson, in his article on heredity, displays wide reading and an impartial judgment; and Dr. J. Anderson's article on hill-forts shows how much solid information may be packed into a small space by a writer who knows his subject thoroughly.

Essays of an Americanist. By Daniel G. Brinton, M.D. (Philadelphia: Porter and Coates, 1890.)

MOST of the papers in this volume have already been printed, but some have been substantially re-written, and each of them derives an added value from the fact that it appears in association with other essays on kindred subjects. Dr. Brinton classifies the various papers under the four headings, "ethnologic and archæologic," "mythology and folk-lore," "graphic systems and literature," and "linguistic." To those who are familiar with his contributions to ethnology and anthropology we need scarcely

say that the volume sets forth the results of much fresh thought and solid work. In some respects the conclusions at which Dr. Brinton has arrived differ widely from those of most other anthropologists. He holds, for example, what he calls "the specific distinction of an American race," and "the generic similarity of its languages." He is also persuaded that the tribes of this race "possessed considerable poetic feeling," and maintains "the absolute autochthony of their culture." These and other positions he defends with much ingenuity, and even those readers whom he may fail to convince will find that it is worth while to master his arguments. As an example of the thorough way in which he works at his subject, we may note his chapter on the Toltecs, whose far-famed empire he describes as "a baseless fable."

Esquisse Historique sur la Marche du Développement de la Géométrie du Triangle. By E. Vigarié. (Association Française pour l'Avancement des Sciences—Congrès de Paris, 1889.)

THIS is a full and carefully drawn-up sketch of what is sometimes called the modern geometry of the triangle. It carries on the bibliographical notice contributed by M. E. Lemoine to the same Association (1885) up to the present time, and supplies some of the lacunæ in that notice. The author appears to be very fair towards foreign mathematicians, and any deficiencies in noticing English contributions are due to there being at present no account of results which may be buried in such journals as the *Mathematician*, the *Lady's and Gentleman's Diary*, and similar works. We have little doubt that an examination of these would lead to the unearthing of many anticipations of recently obtained results.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

A Uniform System of Russian Transliteration.

IN NATURE, vol. xli. pp. 396-97, which has only now reached Tashkend, there is a very interesting note under the above title. It is stated that "the recommended system will be adopted without delay." How is this to be understood? Does it mean that the system is finally settled? It would be a pity if this were so, because the proposed method of transliteration contains a point which would be a source of perplexing difficulties when used in practice.

The suppression of the semi-vowels *ъ* and *ь* (hard and soft pronunciation) at the ends of words, would make many of them indistinguishable. For instance, with the proposed system, the words

пыль (dust)	would be =	<i>puil</i>
and пылъ (heat)	,,	= <i>puil</i>
билъ (did heat)	,,	= <i>bil</i>
and билъ (a bill)	,,	= <i>bil</i>
яръ (precipice)	,,	= <i>yar</i>
and яръ (verdigris)	,,	= <i>yar</i>
данъ (given)	,,	= <i>dan</i>
and давь (tribute)	,,	= <i>dan</i>

and so on.

The differences of these sounds exist for some purpose in the Russian language, and they ought to be rendered in some way in the transliteration. Perhaps the simplest plan would be to adopt the Polish method of denoting the soft pronunciation with an *accent* above the letter in question. The words just given would then be written *dan* and *dań*, *yar* and *yař*, &c.

I may be allowed to make some further suggestions. They are of minor importance, but would tend to improve, in my opinion, the proposed system.

Would it not be more convenient to transliterate the Russian *ъ* with *y*, as is done in the Polish language? The proposed symbol *ui* does not even remotely represent the right sound, and

may cause numerous cases of confusion with the very similar transliterations of the Russian sounds *yu* and *yü*. Moreover, English readers are already accustomed to render *bi* with *y*, as, for instance, in the name of the Pribylow Islands. Why should this name be changed now to *Pribuilow*, which is at the same time unfamiliar and misleading? If the change is made, *u*, *io*, *u*, must be written as *ie*, *iu*, *iu*.

The Russian *ж* might perhaps be better represented by *jh*. The symbol would then represent a softened *j*, equivalent to the French *j*, and reproduce the right sound. A. WILKINS.

Tashkend, April 2/14, 1890.

I ASSUME that the following three conditions must be fulfilled:—

(1) The object aimed at is *principally transliteration*, combined with the possibility of recovering, by its means, the original Russian spelling.

(2) Correct *pronunciation* is only a secondary object, as oral teaching alone can convey it in perfection. Nevertheless, the transliteration adopted should come as near the correct pronunciation as possible, without sacrificing the principal object, transliteration.

(3) The system adopted should satisfy a want, not only of the English-speaking nations, but also, as far as possible, of all those which use the Latin alphabet. This object can be reached only by some mutual concessions.

Now, the system adopted in the article in NATURE (vol. xli. p. 397) would, it seems to me, fulfil these requirements as nearly as possible, if the following comparatively slight modifications were admitted:—

(1) The Russian *ж* would be better rendered by *j* than by *zh*. *ж* has not quite the same sound as the English *j*, which in most cases has a sound of *d* in it (as in journey, jay, jam). But *ж* corresponds exactly to the French *j*, and is not too far remote from the German *jot*. For this reason, as a compromise between the three languages, *j*, as an equivalent of *ж*, would answer better than *zh*. I mean to say that, by means of the *j*, it will be easier for Englishmen, Germans, and Frenchmen to get at the right pronunciation of the Russian *ж* than through the medium of *zh*.

(2) The Russian *ч* (*tcha*) should be rendered by *tch* instead of *ch*, and that for the sake of the French and Germans, whose *ch* is pronounced differently from the English *ch*. For the English reader the adoption of either *tch* or *ch* would not involve any difference of pronunciation.

Thus, the Russian *чай* (*tea*) should be transliterated into *tchaj*, which the three nations would pronounce nearly in the same way; whereas, according to the proposed plan, it would be spelt *chaj*, which a Frenchman would pronounce *shaj* and a German something like *Khaj*. *Чушучее* should be spelt *Tchikhatchev*, and not *Chikhachev*.

(3) For a similar reason I would propose *stch* for the Russian *щ* instead of the *sch* of the proposed system. In Russian *щ* is pronounced exactly like *ш* (*счастье*, *happiness*, is pronounced *щастие*, and *счёт*, *an account*, *счёт*); and for this reason if *ч* (*tcha*) is rendered by *tch*, the addition of an *s* would make it *ш* (*stcha*). The *stch* would be more palatable for the French and Germans than the very puzzling *sch*.

(4) I should propose to use the sign $\frown$ for indicating the compound letters—thus, $\frown$ *tch*, $\frown$ *stch*, &c. This would much facilitate the eventual recovery of the Russian letters.

(5) The last letter of the Russian alphabet, *Ѣ* (called *ijitsa*), is rendered by *ee* in the table (*loc. cit.*). This must be a misprint.

This letter has become almost obsolete in Russian, and is used in the Church Slavonic only. It is the exact equivalent of the Greek *ypsilon*, and should be rendered by *y*.

The requirements of the Italian pronunciation (with its *c* and *ch*¹) and of the Spanish (with its *j*) are more difficult to satisfy; but most of the educated Italians and Spaniards understand other languages. CH. R. OSTEN-SACKEN.

Heidelberg, Germany, May 5.

The Eruption of Vulcano Island.

IN the pages of NATURE two notes have appeared from my pen describing the phenomena of the eruption that commenced

¹ In De Gubernatis's "Dizionario Biografico," 1879, *Tchikhatchev* is spelt *Cihacheff*.

on August 3, 1888, which *apparently* is now coming to an end. I have not been able to visit the spot recently, but my friend and pupil Mr. Lewis Sambon, who helped me in conducting the party of English geologists through the Lipari Islands last autumn, and on whom I can thoroughly depend, has given me the information that I make use of in these notes. Mr. J. P. Iddings, whom Mr. L. Sambon accompanied, also kindly confirmed some of the latter, besides which Mr. Sambon brought back a few very good whole-plate negatives.

From September 1889, when I and the geologists were at Vulcano, the eruption has continued with very varying activity. On March 15, 1890, at 9 p.m., there was a very violent explosion resembling the blowing up of a mine. Some windows were broken at Lipari, which is about seven kilometres distant, whilst lapilli reaching the size of large peas, with drops of condensed vapour, were showered upon the town. Behind Monte della Guardia, which hides Vulcano from the town of Lipari, for upwards of three minutes a bright red reflection was seen, which is of importance as indicating the presence of incandescent matter in the volcanic chimney; for there are floating about a number of extraordinary hypotheses, some verging on the magical, to explain this eruption.

After the evening of the 15th, Vulcano was very active, but the explosions were gradually diminishing in force, and completely stopped on the 17th.

On March 25 my two friends visited the island. They found at the base of the cone an enormous number of the *bread-crust bombs*, the mode of formation of which I have already described and explained. These were of recent ejection, and Mr. L. Sambon says they much resemble those of the earlier period of the eruption; and the specimens which have been kindly brought to me thoroughly confirm this view. Both those examined on the island, and the smaller ones I received still contain numerous fragments of dolerite, which, as I have shown, give origin to much of the pyroxenes, magnetite, olivine, and triclinic feldspar distributed throughout the paste, and the origin of which is proved by the fact that they are rarely without a bit of the old microlitic dolerite base still attached to them even when very small crystals nearly isolated occur. Such is the amount of impurity of the paste that any attempt at a chemical analysis would be a waste of time, and even the microscope can afford us little information as to the group of rocks to which the magma belongs. The general facies of the projectiles, the earlier products of this cone, all point to the rock being near to if not really a rhyolitic obsidian. Referring to a discovery I made last autumn Mr. Sambon says:—"I broke a great number of the bombs, but I found in none of them that white agglomeration of quartz and feldspar that we often met with in September 1889." These inclusions much resemble numerous similar ones that I found in 1887 in an old lava stream of Stromboli, and which have been sliced, and the examination of which will be published soon. In the meantime they may be said to be composed chiefly of milky quartz and feldspar of metamorphic or plutonic origin, and are no doubt the remnants of the sub-volcanic platform.

Some of the recent bombs reach gigantic sizes for such a small volcano. One of these, possibly shot out on March 15, 1890, was, above ground, 9 feet high, 6 feet broad, and 6 feet thick. The obsidian crust was 4 inches thick, and the main fissure, through which the pumiceous interior protruded, was 2 feet broad, forming, as it were, a monster crusty loaf.

So violent were the explosions on March 15, 1889, that Signor Jacono, Mr. Narlian's factor, had to fly for protection with his family to the caves near the Faraglioni, because great stones were falling in considerable numbers near Mr. Narlian's villa, which is about a kilometre from the crater.

Mr. L. Sambon describes the crater as some metres deeper than when we visited it together six months before; but, comparing his and my photographs, there has been very little change. The crater walls were covered with yellow sublimations, which were not so in September 1889, and he judges their inclination at from 40° to 45°. In the centre of the small floor was a great white patch with yellow border, which my experience would lead me to suppose to be due to boric acid, with the edges of a mixture of seleno-sulphur and realgar. A good deal of smoke (which is again new) was issuing from the bottom, especially to the north-north-east; and a few metres only from the edge of the slope beneath the highest point, and extending to where we took our photographs, were a considerable number of fumaroles. One of those nearer the last point (north-north-west) was much larger, issuing from a fissure, and so violent and