This statement is not perfectly correct.

The expression of the Chamberlain of the Corporation, as recorded in the official register, and as correctly reported in the principal newspapers, was:—

"When the national standards of measure and ponderosity were by accident lost to the nation, you were applied to for the accomplishment of their restoration with that mathematical exactitude which was indispensable."

The statement in NATURE will be made correct by erasing the word "Metric" and substituting "National."

G. B. AIRY

The Origin of our Numerals

MR. DONISTHORPE'S ingenious construction of our numerals by corresponding numbers of lines (NATURE, vol. xii. p. 476) induces me to offer a few remarks on this subject, which has a literature of its own. There can be no doubt, I believe, that our forms were derived directly from the Arab series called Gobar; that the Arabs had them from the Indians, and the Indians from the Chinese. My esteemed friend Dr. Wilson, of Bombay, published a "Note on the Origin of the Units of the Indian and European numerals," in 1858,* in which he showed the derivation of some of our numerals from ancient Indian forms found on cave inscriptions of Western India, on the Bhilsa Topes, and on coins. My remarks are founded wholly on the forms given in this note, which is little known, I believe, in England.

Dr. Wilson obtains our first four numeral forms from the Chinese, traced through different Indian script characters nearly as supposed by Mr. Donisthorpe. One, two, three horizontal bars and a square for 4. He also finds the eight in the forms ,  , and  on the cave inscriptions.

Before proceeding to the other numerals I wish to notice a rule which may be deduced from the consideration of the changes in the forms of numerals in passing from one people to another, that the same form may be turned through angles of 90° or 180°, and may be inverted or reversed without altering its value. Even the same people have used a form turned in different ways for the same numeral. The Arabs used their 2, 3, and 4 in two ways, making angles of 90° with each other; the 2, 4, and 5 of Sacro Bosco and Roger Bacon were the Indian script Modi (and ours) turned through 180°, or upside down; other examples will be noticed.

The most important derivation by Dr. Wilson is that from the Chinese  ten; this is found on the Bhilsa Topes with a circle round it (Dr. Wilson thinks to distinguish it from the oldest form of K found on the cave inscriptions). The nine is found on the Bhilsa Topes as  , or one under ten, and on old coins thus:  . The Indian caves give half of ten  ,  , for five (as V is the half of the Roman ten, X). It is from this form that Dr. Wilson derives the Indian Modi and Nagari fives  ,  ,  . It is here that I venture to differ slightly from Dr. Wilson. One of the cave forms of four is  , which Dr. Wilson interprets (as in the case of nine) one under five, or five less one; now this form without the under bar, as well as the other forms of five, are, it seems to me, the halves not of the cross () merely, but of the cross and circle thus: ,  ,  , which are as nearly as possible two half diameters and half circumference. The form  is, I believe, the origin of our four, and not the Chinese or Indian square, as supposed. This I think will be evident when we compare the Arab four () with the Indian four above. The Arab four s also employed thus:  , which inverted gives  , a sufficiently near approximation to our four.

Dr. Wilson has not been able to find the origin of our seven, but this is obtained from his Arab seven  , by turning it round () and making one leg shorter than the other, nearly resembling the Gobar seven  . We may also find an earlier source in the Chinese seven turned round 180°,  , which is almost exactly the German written seven. Neither six nor seven is to be found on the cave inscriptions. In Dr. Wilson's Arab series the Indian five  is used for six, and the Gobar six, as well as ours, may be taken from the Nagari seven  . We may also find an origin in the Chinese six  , by omitting the horizontal bar, as in the case of the seven. That such liberties were taken is evident on a consideration of the five of Sacro Bosco and Roger Bacon (), the Indian five *without the bar*, and turned round 180°. If there is any merit in these suggestions it belongs to Dr. Wilson.

JOHN ALLAN BROUN

* See "India Three Thousand Years Ago." By John Wilson, D.D., F.R.S. (Bombay; Smith, Elder, and Co., 1858.)

On the Cup-shaped Joints in Prismatic Basalt

THE difference between Mr. Mallet (NATURE, vol. xiii. p. 7) and myself is simply this. He asserts, as necessary to his theory, that the "convexities" should always project in the direction in which the cooling and consequent "splitting is proceeding" ("Proceedings of the Royal Society," No. 158, p. 182). I referred him to the beautiful specimen, in the hall of the Geological Society's Museum, of three columns, one of which exhibits an articulation in the shape of a double-concave lens; the adjacent convexities consequently pointing, in this case, in *opposite directions*.

Mr. Mallet's reply to this is, that the cooling must have proceeded, in this instance, in different directions, and met in the biconcave-lens-shaped articulation. Now, inasmuch as this articulation is only a few inches (three or four) thick, and shows no sign of seam or separation across it, and Mr. Mallet himself declares (in the article mentioned above) that the plane which separates the part cooled from above, from that which cooled from below, "consists of irregular fragments," I maintain that his explanation is inadmissible and self-contradictory. Any geologist who takes sufficient interest in the question to examine the columns for himself will be easily satisfied on this point.

Nov. 8 G. P. SCROPE

A New Palmistry

THE proportions of the fingers in the two hands are not, I think, always the same. With me the index finger of the left hand is considerably longer than the ring; in the right they are very nearly equal.

R. A. PRYOR

Hatfield, Nov. 12

OUR ASTRONOMICAL COLUMN

THE MINOR PLANETS.—The discovery of No. 154 by M. Prosper Henry at the Observatory of Paris, on November 6th, is announced in M. Leverrier's Bulletin and by circular with the "Astronomische Nachrichten;" and that of No. 155 by Herr Palisa at Pola on the 8th inst., in the Paris Bulletin of the 13th. They are of the same magnitude (twelfth) as the three previously detected during the present month.

The rapid increase in the number of small planets must soon occasion serious difficulty, not only in predicting their positions with sufficient approximation to allow of their being recognised without considerable expenditure of time and trouble, but likewise in securing observations, especially on the meridian, according to the system pursued for some years past at Greenwich and Paris, by agreement between the Astronomer Royal and M. Leverrier.

As regards the preparation of ephemerides, it is well known that the conductor of the "Berliner Astronomisches Jahrbuch," Prof. Tietjen, makes it a speciality of his work, with the aid of a numerous body of astronomers in various parts of Europe and in the United States, and hitherto he has succeeded in providing observers with an ephemeris of nearly every small planet detected to within a short time of publication. Thus, in the Jahrbuch for

1877, we find approximate places for 1875, of 134 out of 138 planets—materials for calculation not being available in four cases—and accurate opposition-ephemerides are given where the elements have been perturbed to the year, and for those planets for which Tables have been prepared. The initiated in these matters will be aware that a work of this extent involves a vast amount of labour, which will be greatly increased with the present rate of discoveries of new members of the group of small planets.

In some few instances the perturbations have been determined with every possible precision, with a particular object in view, as in the case of Themis, the motion of which was rigorously investigated by Dr. Krüger, for a determination of the mass of Jupiter; and for those planets whose perturbations have been thrown into the form of Tables, it was also necessary to settle the elements with great accuracy, though the results have not been in every case so satisfactory as might have been expected. We have now Tables of Amphitrite, by Becker; of Iris, Flora, and Victoria, by Brünnow; Egeria, by Hansen; Metis, Lutetia, and Pomona, by Lesser; and of Parthenope, Eunomia, Melpomene, and Harmonia, by Schubert.

Even with approximate places of these bodies, so long as they are situated within about 3° from the ecliptic, the charts of small stars now in the hands of astronomers allow of their being identified without much difficulty with the equatorial, and the errors of the predicted places being determined by this instrument, their meridional observation is greatly facilitated. Still, rough ephemerides must be prepared, and a considerable amount of time will be involved in ascertaining their errors, and as observations made with this purpose in view may be so conducted as to give positions pretty nearly as reliable as those generally resulting from meridional observations, we shall not be surprised to learn that the latter are soon relinquished, except perhaps for the older minor planets and for such as attain the brightness of stars of the eighth or ninth magnitude, and are accurately predicted. The subdivision of labour as regards observations does not appear to have so far worked very efficiently, though proposed many years since—another effort, however, may be necessary in this direction, and it may at least be expected that those who by their discoveries are so rapidly increasing the list of planets, will keep them in view for a sufficient length of time to allow of their elements being well determined.

Egeria, which has now about the brightness of an average star of the ninth magnitude, is favourably situated for observation; it has lately passed amongst the outliers of the Pleiades. The following places are for Berlin midnight:—

	R.A.	N.P.D.	Distance from earth.
	h. m. s.	° ′	
Nov. 18	3 18 59	65 53·3	1·478
,, 20	3 16 32	65 47·8	1·479
,, 22	3 14 6	65 42·6	1·481
,, 24	3 11 42	65 37·7	1·484
,, 26	3 9 21	65 33·1	1·488
,, 28	3 7 3	65 28·8	1·493

Lutetia, a bright eleventh magnitude, is approaching opposition. Places, also for Berlin midnight, are:—

	R.A.	N.P.D.	Distance from earth.
	h. m. s.	° ′	
Nov. 18	4 54 11	68 34·1	1·480
,, 20	4 52 8	68 35·0	1·477
,, 22	4 50 1	68 36·1	1·474
,, 24	4 47 52	68 37·3	1·472
,, 26	4 45 40	68 38·6	1·472
,, 28	4 43 26	68 40·0	1·472

SCIENCE TEACHING TO YOUNG CHILDREN

THE leading article in NATURE of Oct. 28, on the Sixth Report of the Science Commission has made me think that possibly a short account of an attempt to teach science to boys younger than those to whom that report refers, may be not without interest for some of your readers.

There are at present about fifty boys in this school, varying in age from seven to fourteen, the majority of whom are going to one or other of the great public schools. In order to attain the high standard of classical work necessary, half the school-hours have to be given up to Latin and Greek. Enough time still remains, however, even after providing for the requirements of mathematics, French, and the usual English subjects, to enable every boy to learn either botany or chemistry. For this purpose the school is divided into three classes, the lowest of which contains about twenty boys, whose average age is nine. Class II. is composed of ten boys of an average age of twelve, while the first class contains twelve boys of an average age of twelve and a half. Class III. has two lessons in botany of three-quarters of an hour each, and one hour's lesson on physical geography in the course of the week. The boys in it are taught to distinguish the parts of a flower, and by the help of a chart similar to that given by Mrs. Kitchener in her "Year's Botany" to discover the order to which any plant belongs. The winter is employed in learning the chart, and in studying the characters of the different orders as shown on Henslow's Botanical Diagrams. Illustrations taken from Sir John Lubbock's and Mr. Darwin's books, of the relations between plants and insects, and facts bearing on the geographical distribution and economical uses of plants, add interest to these lessons. The second class also does botany, but is able to give two-and-a-half hours per week to it. The standard of knowledge aimed at is such as is contained in Prof. Oliver's or Mrs. Kitchener's books and the boys are expected to be able to find out any given plant in Bentham's British Flora. The boys in Class I. learn chemistry, and spend one afternoon of one-and-a-half hours at practical work in a small laboratory. Another afternoon is employed in listening to a lecture founded upon Miller's Chemistry (Text-books of Science series). Two additional half-hours are given to getting up the portion of Miller lectured on, so as to be able to answer questions on it at the beginning of the next lesson. The boys have also to keep notes of the lectures and of the laboratory work. The standard aimed at is the power to discover a simple acid and base, and an acquaintance with the text-book. During the summer the chemistry boys have a botany lesson once a fortnight, in order that they may keep up what they had previously learned. In addition to this regular work, Classes I. and II. have occasional lectures either on chemical physics, "Erdkunde," or some such subject. As regards marks, all the various school subjects stand on an equal footing.

The science lessons are very popular with the boys, as is shown by their frequently referring to them out of school, and by their occasionally bringing home plants in order to make them out. But we hope that the boys will retain some considerable amount of knowledge beyond the mere power of making out the flowers given to them, or that of doing simple analysis, and though perhaps few of the younger boys would be able to pass a thoroughly satisfactory *written* examination, in either chemistry or botany, yet a good deal more knowledge might be questioned out of even them by an experienced examiner than they would be able to put upon paper. Mere knowledge of the facts of either science is not the object at which we have been chiefly aiming. These sciences were chosen less as subjects of study than as instruments of training in order to cultivate the powers of observation, and to encourage a habit of inductive reasoning. If the teaching of science in its early stages is thus regarded more as a means than as an end, there is no child, who has begun to learn anything at all, who may not be taught some branch of it with advantage.

At the same time there is a danger to be avoided.