trical resistance, the number of B.A. units adopted as representing the resistance of a column of mercury 100 centimetres in length, one square millimetre in section, at a temperature of 0°C . be '9540."

It follows from this that the legal ohm of the Paris Congress, which is defined as the resistance of such a column 106 cm. in length, contains 1'0112 B.A.U., while the B.A.U. contains '9889 legal ohm. Thus resistances which are expressed in terms of B.A. units may be reduced to legal ohms by multiplying by '9889, while makers and others who have a standard B.A. unit can construct a legal ohm by making a coil equal to 1'0112 times that unit.

A resolution of the nature of the above was rendered necessary by the fact that the legal ohm is defined in terms of the resistance of a column of mercury, while the resistances in use in England are B.A. units. The relation between the two has been determined by different observers with slightly different results. The Committee hope to secure uniformity in the resistances sold to the public as legal ohms, by stating the number they intend to adopt for the purpose of issuing standards.

R. T. GLAZEBROOK,
Secretary Electrical Standards Committee
of the British Association

The Yard, the Metre, and the Old French Foot

THE ratio of the metre to the yard can scarcely be said to be known with certainty at the present day. The latest and most exhaustive investigation of this question is due to Prof. W. A. Rogers of Cambridge, Mass. The value which he assigns to it (pending a final and authoritative comparison of the "Mètre des Archives" with its chief representative, by the International Commission of Weights and Measures) is—

$$39\cdot37027 : 36.$$

This ratio is very nearly identical with the much simpler one—

$$35 : 32,$$

the error of which is less than 1 in 8000. If we disregard this error, the conversion of yards into metres can be effected with the greatest ease by the following arithmetical process. Thus—

Given	...	...	35	yards or	39'37027	yards
Subtract	1/10th	...	- 3'5		- 3'937027	
Add	1/7th	...	+ '5		+ '5624324	
Results			32'0	metres	35'9956754	metres
				Error	- '0043246	

By a singular piece of good luck, this error, small as it is, may be entirely removed by one more easy approximation: for dividing the last quotient by 130 gives + '0043263—where the outstanding disagreement is less than a unit in the last given figure. Hence, if we wish for a closer conversion than will be given by the terms 1, - $\frac{1}{10}$, + $\frac{1}{7}$ (of the last), we have only to add further, + $\frac{1}{130}$ (of the last) to obtain the utmost accuracy at present possible.

The converse operation—to convert metres into yards—is not quite so short and easy in the closer approximation. The following shows the approximate and the more exact conversion:—

			Ex. 1	Ex. 2
Given	...	...	32 metres	36 metres
Add	1/10th	...	+ 3'2	+ 3'6
Subtract	1/16th	...	- 0'2	- 0'225
„	2/100ths	...	—	- '0045
„	1/20th	...	—	- '000225
Results			35'0 yards	39'370275 yards

The fact is, almost any conversion may be performed in some such way, in three or four operations; and it was not for the sake of the rigorous ones that this note was written, so much as to bring into notice the very close and useful approximation represented by the ratio 32 : 35.

By way of applying the rules usefully, we may take as examples:—To find the equivalent of a kilometre in yards, and of a mile in metres. Thus—

1000 metres	...	...	1760 yards
+ 100	...	...	+ 176
- 6'25	...	...	- 25'14286
- '125	...	...	+ '19341
- 00625	...	...	—
Answers	1093'61875 yards	...	1609'3363 metres

Here we see that the approximate ratio 32 : 35 entails an error of only 0'131 yard (or less than 5 inches) in one kilometre; or of 0'193 (or less than 2) decim. in one mile, so converted.

The old French foot, the sixth part of the toise—the famous "Toise of Peru"—survives now practically only in the Prussian toise, so far as that is not superseded by the metre. Whatever may be its present range, the ratio of the old French foot to the present English foot is curious. I believe it may be expressed, within the limits of error of the relation so far as can now be known, by the fraction 389/365. That is to say, the excess of the former is $\frac{24}{365} \times$ the latter, the two components of which fraction are such as may easily be remembered when once the coincidence has been noted.

J. HERSCHEL

Collingwood, July 25

Fireballs

IN reference to the phenomena of fireballs the following notes may be of interest. Last year, in July, I was residing on Naphill Common, Buckinghamshire. About midday, during my absence at Oxford, a violent thunderstorm broke over the district, and appeared to extend from Oxford to London. On returning I found that the house had been struck by lightning, apparently in two places. One chimney was knocked in through the roof, the debris partly filling up my room. The kitchen chimney had also been visited, the lightning breaking some of the brickwork of the hearth, and passing a person cooking at the fire; two or three others were in the house at the time, but no one was hurt. On carefully examining the marks left, I found that a door in a room adjoining the one above-mentioned had been split, and some iron knobs knocked off and broken, the screw nails being removed out of the wood, and a large hole several feet square made in the side of the house. From examination of the outside of the wall at the foot of the kitchen chimney, the bricks showed displacement opposite the marks inside at the hearth. I believe a tree was struck, and a water-trap or cess-pool shifted out of position. Some men using a reaping machine in a neighbouring field stated that they knew the storm was coming by the fire playing about the blades of the machine. A boy who had been near at the time said that he saw a large ball of fire fall on the house, which it seemed to enter; it then re-appeared, and passed into the meadow. I therefore think it likely that the damage done to the rooms and side of house was due to the electric development called a fireball.

Glasgow

W. J. MILLAR

The Swallowing of one Snake by another

As the author of the article "A Cannibal Snake" (NATURE, July 3, p. 216) wishes to know whether an instance similar to that recorded by him has ever before been brought to notice, I feel bound to publish an occurrence which I witnessed many years ago, and of which I have often told, without ever putting it into writing. During the summer of 1857 I lived in the environs of Washington; as an amusement, snakes were kept in cages. Sometimes, in the evening twilight, when toads and frogs appeared on the garden paths we used to feed the snakes with them. The usual habit of the snakes was to seize the toad wherever the jaws happened to strike, and to move them afterwards along the body of the victim, so as to begin the process of swallowing from the head. Once I threw a toad into a cage containing two of the common water-snakes of that region (*Nerodia sipedon*, if I recollect right, is the scientific name of the species). Both seized the toad at the same time; the one near the head began at once to swallow; the other put its jaws in motion as usual, in order to get at the head, but in doing this it reached the head of its comrade, and began to swallow that, as well as the toad. This went on for some time, until about three-quarters of the one snake were engulfed within the other. Then the snakes separated again, the swallowed one coming out covered with slime, but apparently unhurt and as lively as ever. It lived a long time afterwards. The snakes were of about equal size, and, as far as I remember, from $2\frac{1}{2}$ to 3 feet long. I suppose that it was the swallowing snake, and not the swallowed one, that kept the frog, but I do not think I ascertained the fact at the time. The whole performance lasted a few minutes only.

Heidelberg, Germany, July 27

C. R. OSTEN SACKEN

The Red Sunsets

I NOTE in NATURE of July 3 (p. 229) an abstract of a communication of M. Gay to the Paris Academy of Sciences, made