$F(x)$	$\int_0^1 F(x)dx$	Number of ordinates used. 2	4	6	8
Semicircle $(x-x^2)^{\frac{1}{2}}$	0·3927	0·4000	0·3949	0·3939	0·3934
Quadrant $(1-x^2)^{\frac{1}{2}}$	0.7854	0·7898	0·7868	0·7862	0·7859
Parabola x^2	0·3333	0·3400	0·3350	0·3341	0·3337
$\sin x$	0·4597	0·4580	0·4593	0·4596	0·4596
$\log(1+x)$	0·3863	0·3850	0·3859	0·3861	0·3862
e^x	1·7183	1·7234	1·7197	1·7187	1·7186
$\frac{1}{1+x}$	0·6931	0·6945	0·6937	0·6934	0·6933

(3) If $F(x)=a+bx+cx^2+dx^3$,

$$\int_0^1 F(x)dx=\tfrac{1}{3}\left[F\left(\frac{2-\sqrt{2}}{4}\right)+F(\tfrac{1}{2})+F\left(\frac{2+\sqrt{2}}{4}\right)\right]$$
$$=\tfrac{1}{3}[F(0{\cdot}1464)+F(\tfrac{1}{2})+F(0{\cdot}8536)]. \quad . \quad (b)$$

A simple three-ordinate rule is therefore

$$\int_0^1 F(x)dx=\tfrac{1}{3}[F(\tfrac{1}{7})+F(\tfrac{1}{2})+F(\tfrac{6}{7})].$$

In practice this is not quite so convenient as the application of the two-ordinate rule.

A. F. DUFTON.

Trinity College, Cambridge, May 20.

P.S.—I thank Mr. C. F. Merchant for pointing out in NATURE of June 3 that the four-ordinate rule is already in use, and for giving a reference to Tchebycheff's rules, with which I was unacquainted. The positions of Tchebycheff's ordinates, as in (*a*) and (*b*) above, are inconvenient, and the rules obtained by taking neighbouring ordinates attain simplicity without great loss of accuracy. A. F. D.

June 5.

The Cost of Laboratory Fittings.

IT is evident from the correspondence which has followed the publication of the letter from me on the subject of laboratory fittings that I must again ask leave to trespass on your space in order to explain that my remarks referred solely to fixed fittings, as stated, embracing working benches, lecture tables, and the like. I have no doubt that questions of actual instruments and apparatus are of much greater importance, but of these I have no right to speak.

Perhaps I may be allowed to make myself clear by reference to one or two specific directions in which research on fixed fittings might possibly prove useful. The present price of teak as bought in bulk from a merchant is 30*s*. per cubic foot, and if impregnated soft wood could be substituted for bench and table tops much saving would result. This impregnation might be effected by precipitation, electrolysis, oxidation (oils), or evaporation (*e.g.* silica solutions). Again, bituminous materials with perhaps barytes rolled into them might be investigated for use as a thin layer on wood or concrete. Soapstone is much used in America and *lave émaillée* in France, but not as yet in this country. There are, further, certain hard flooring plasters which should be very inert chemically. An investigation is much needed into the proper composition of bituminous materials for coating laboratory drains. Drains executed in wood thus coated are in many cases much cheaper than glazed ware drains.

For repetition work such as locker doors and even drawers pulped and stamped material might prove economical if some standard could be agreed upon. It should not be a very expensive matter to set on foot some researches of this nature, and any effective results would, I imagine, be very welcome to institutions at present faced with additions to their material equipment. ALAN E. MUNBY.

9 Old Square, Lincoln's Inn, W.C.2.

The First Act of a Young Thrush.

SINCE observations of the first acts of wild birds immediately after hatching are very difficult, the following may be worth recording. Last week I went to look at a thrush's nest which I had found a fortnight before, with four eggs in it. Two eggs were hatched and two were not. As I was watching the young birds, one of the two remaining eggs cracked right across, and I saw the bird wriggle out and toss the two halves of the shell out of the nest by a convulsive movement of its back; but the curious thing was that, before the bird was properly free from the shell, it opened its beak—as if for food. I dug up a worm near by and offered it to the bird, which swallowed it eagerly. I purposely dug for the worm in a place from which I could see the nest, and I feel sure that the parent bird did not come and feed the nestling meanwhile. A few minutes later the other egg hatched, and the bird behaved just as in the former case, opening its beak before it was out of the shell.

Now the question is: Was the opening of the bird's beak a reflex or an "instinctive" act? If it were reflex, it would presumably have been induced by sudden exposure to the new environment of open air; and, obviously, such a reflex act would serve the purpose of an "instinctive" one in this case. Moreover, is it not a question whether any "instinctive" act at so early a stage can be anything more than a reflex act thus adaptable to survival purposes—by natural selection if need be?

HONOR M. M. PERRYCOSTE.

Polperro, Cornwall, May 30.

Marat and the Deflection of Light.

CARLYLE'S vivid portraiture of Marat as "horse-leech" and savage revolutionist has rather obscured the fact that this "friend of the people" was a learned doctor of medicine, a physicist, and a physiologist. It is true that Carlyle refers to him as "Renovator of Human Science, Lecturer on Optics," but the mistake about the "horse-leech" is repeated in the same passage.

In Marat's "Notions élémentaires d'optique" (1784), p. 16, the following statement is made:

"Il est hors de doute, que les rayons de lumière changent toujours de direction dans le même milieu, lorsqu'ils passent à certaine distance d'un corps. Se trouvent-ils dans la sphère d'attraction? ils se replient jusqu'à certain point à sa circonférence, et se prolongent ensuite en droite ligne."

This at first glance may appear a remarkable anticipation of recent discoveries in physics, but in reality the conclusion is based on wholly false premises, as further reading of the pamphlet will disclose. W. A. OSBORNE.

University of Melbourne, April 22.

British and Metric Systems of Weights and Measures.

ON p. 355 of NATURE of May 20 Mr. M. E. Yeatman in a letter on the above subject says: "It seems that the advantage of any given system of weights or measures lies largely in the facilities that it offers for the division of a sum or quantity into equal parts"; and I have seen "facility of factorisation" claimed before as one of the merits of the British system. As an engineer who "figures frequently," I fail to appreciate this fetish of factorisation. One uses a slide-rule and logs, and never worries about factors. Will Mr. Yeatman, or someone else, demonstrate the use of factors in practical calculations, bearing in mind the use of slide-rules, calculating machines, and logs?

The metric system seems to be gaining ground in spite of the lack of factors disclaimed for it.

ALFRED S. E. ACKERMANN.