Millais, with sixteen full-page illustrations; "Ships' Boats: Their Qualities, Construction, Equipment, and Launching Appliances," E. W. Blocksidge; and a new and revised edition of "Recent Advances in Physical and Inorganic Chemistry," Dr. A. W. Stewart, with an introduction by the late Sir William Ramsay, K.C.B., F.R.S., illustrated.

MR. F. EDWARDS, of 83 High Street, Marylebone, has just issued Catalogue No. 384 of books dealing with a variety of subjects, but mainly architecture, printing and bibliography, and bookbinding. The sections appealing more especially to readers of NATURE are those relating to archæology, gardens, and the proceedings of many provincial scientific societies.

MESSRS. J. M. DENT AND SONS, LTD., have received a licence from the Controller of Patents to publish a translation of "The Biology of War," by Prof. G. F. Nicholai, the former holder of the chair of physiology in Berlin University, who, after imprisonment in Germany for his opinions, escaped to Denmark by aeroplane.

OUR ASTRONOMICAL COLUMN.

BORRELLY'S COMET.—L. v. Tolnay gives the following elements of this comet in *Astr. Nach.* (No. 4961); he has computed planetary perturbations, including those of Mars, to which the comet made a near approach at the beginning of 1912:—

$T = 1918$ Nov. 16·6818 G.M.T.
$\omega = 352^\circ\ 23'\ 0{\cdot}73''$
$\Omega = 77^\circ\ 1'\ 47{\cdot}71''$ } 1925·0
$i = 30^\circ\ 29'\ 29{\cdot}01''$
$\phi = 37^\circ\ 57'\ 20{\cdot}77''$
$\mu = 513{\cdot}90816''$

The following ephemeris is from a Marseilles Circular (for Greenwich midnight):—

	R.A. h. m. s.	N. Decl. ° ′	Log r	Log Δ
Nov. 2	6 33 30	2 20	0·1478	9·7978
6	6 38 58	4 52	0·1463	9·7766
10	6 44 1	7 44	0·1454	9·7561
14	6 48 35	10 57	0·1449	9·7367
18	6 52 37	14 30	0·1449	9·7190
22	6 56 3	18 24	0·1453	9·7035
26	6 58 49	22 36	0·1462	9·6910
30	7 0 49	27 2	0·1476	9·6822

Harvard Bulletin (No. 669) gives the following observations made at the Yerkes Observatory by Mr. Van Biesbroeck:—

G.M.T.	R.A. h. m. s.	S. Decl. ° ′ ″
Aug. 31·89146	4 39 19·15	14 1 50·0
Sept. 5·91563	4 45 18·78	13 29 47·4

The comet had a diffused elongated nucleus in P.A. 95°, a tail 40″ long in the same direction; its magnitude was 13; it may rise to the 9th magnitude in November, being fairly near the earth.

WOLF'S COMET.—The following is a continuation of M. Kamensky's ephemeris for Greenwich midnight:—

	R.A. h. m. s.	Decl. ° ′	Log r	Log Δ
Nov. 2	21 4 59	2 50 N.	0·2138	0·0608
6	21 13 52	1 48	0·2112	0·0677
10	21 23 8	0 51 N.	0·2088	0·0749
14	21 32 46	0 1 S.	0·2066	0·0824
18	21 42 42	0 49	0·2048	0·0904
22	21 52 56	1 31	0·2032	0·0986
26	22 3 24	2 8	0·2018	0·1072
30	22 14 3	2 40 S.	0·2008	0·1159

The comet is likely to be of the 10th or 11th magnitude.

SOLAR-LINE DISPLACEMENTS AND RELATIVITY.—A further contribution to the study of solar-line displacements in connection with Einstein's theory of relativity has been made by Mr. J. Evershed (*The Observatory*, vol. xli., p. 371). Thirty of the lines composing the cyanogen band λ 388 were carefully selected for observation, and their displacements determined by comparison with the corresponding lines in the carbon arc. The provisional mean values for the shifts are +0·004 A at the centre of the disc, and +0·006 A at the polar limbs. There appears to be a curious systematic difference in the results for the north and south polar limbs, the former agreeing approximately with the centre of the disc, while the latter consistently showed the much larger displacement of +0·008 A. The displacements as a whole are larger than those found by Dr. St. John, but they are still, on the average, not much more than half the predicted gravitational effect, whilst for iron lines the shifts are in many cases twice as great at the limb as is required on the relativity hypothesis. In explanation of the limb displacements Mr. Evershed suggests that the effect may possibly be due to the unsymmetrical shading towards the red of the majority of the Fraunhofer lines, which would be emphasised at the limb in consequence of the longer path of the photospheric light through the absorbing vapours. A large proportion of iron lines have, in fact, been found to be very slightly shaded towards the red in the laboratory spectrum. In agreement with Dr. St. John, Mr. Evershed considers his results unfavourable to the theory of relativity.

SCIENTIFIC AND PRACTICAL METRIC UNITS.

WE have received a communication from Dr. John Satterley, of the University of Toronto, with reference to Sir Napier Shaw's article on "Units and Unity" in NATURE for June 27, in which he complains of "the bewildering array of powers of ten" that hamper the C.G.S. system of electro-magnetic units and the practical units of electricity. Dr. Satterley makes the same complaint of other measures based on the metric system, which he admits is admirable for purposes of scientific measurement, but not for everyday use until it is simplified and the names of its units are shortened. He cites the milliwatt as representing a complication so intricate that nobody but a professional metricist knows what it is.

The communication represents the impossible position which some teachers of science practically take up consciously or unconsciously. The introduction of C.G.S. units into scientific measurement is an accomplished fact; and if scientific measurement is to be the headlight of practical life, it is absurd for the ordinary sensible man to be kept in ignorance of the units with which scientific men work. It has been remarked in some quarters that Sir Napier Shaw's article should have been addressed to the uninformed and unconverted: that readers of NATURE were all agreed upon the question. But if the agreement is only with the reservation that the organised system of physical units as it exists is reserved for the inner circles of scientific society, while the inch and the English system are good enough for the ordinary dealings of everyday life, it is obvious that the practical applications of science in this country must continue to be crippled as heretofore.

The beginning of Dr. Satterley's complaint is that "metricists are continually inventing new units—practical units (so-called) which are multiples of the centimetre, the gram, and the dyne." Who are the

delinquents in that case we do not know. Dr. Satterley professes his ignorance of the millibar. He may not have seen Prof. V. Bjerknes's work published in Washington, or the discussions that have taken place upon it in meteorological publications. He should not, however, complain if those whose scientific lives depend absolutely upon measures of the pressure of the atmosphere feel necessities which he does not share. If he himself is unaware of the literature of the subject, he can get the information which he seeks very simply by asking his colleague who is charged with the duty of expounding the important subject of dynamical meteorology in the University of Toronto just as he would ask a mathematical colleague if he came across an equation which he could not solve. No doubt the powers of ten are awkward, and those that are superfluous will pass away with practical use, but not before.

The general question of the reform of our system of weights and measures is raised again by the Ministry of Reconstruction in the report of Lord Selborne's Sub-Committee appointed to consider the methods of increasing home-grown food supplies in the interest of national security. One difficulty in the way of home-grown supplies to which the report directs attention is the chaos of different units and the divergence of standards of measurement for agricultural produce. The Sub-Committee proposes, therefore, that a uniform standard of weight should be laid down on which alone sales and purchases of agricultural produce, other than liquids and certain market-garden produce, should be legal; with standard measures also for liquids and of number for market-garden produce habitually sold in that way. Now that the sale of produce is no longer between the local grower and the local shopkeeper, but is so organised that narcissus grown in Scilly may be sold as cut-flowers in Aberdeen, the old conventional methods of sale by the habit of local pottle or basket are certainly out of date.

There is no doubt that selling by weight is the scientific mode of procedure, and for dealing with shiploads the only practicable method. Also for the final distribution of the stock to small purchasers weighing is the only satisfactory basis of a modern bargain. For the intermediate stage between the large producer and the small buyer the measure of capacity that is based upon convenient packing for transport is very serviceable. When produce must be put into sacks, or pots, or flats in order to get it to market it is in so handy a form for sale and so badly arranged for weighing that some scale of equivalents must come into vogue either by agreement or by law, and it should be the object of legislation to make that easy and not difficult; just as wherever beer is sold it must be sold by the barrel, whether the barrel contains 36 gallons or 163 litres.

The really debatable point, however, about a revised scheme of selling produce by weight is what the standard of weight shall be. Here the ton and the pound are the rivals, just as the pound (in another sense) and the penny are rivals in decimal coinage. There is such a convenient bridge to the metric system through the ton that an English name for the kilogram would be the best solution. If anyone can produce a monosyllable that would be generally adopted as a designation of a weight of about 2·2 lb., the rest might be comparatively easy. "Kilo" is neither sufficiently euphonious nor sufficiently exclusive.

Sale by number is another matter with a great history of its own, depending upon the art of bargaining. When we have got rid of long hundreds, and bakers' or booksellers' dozens, and scores which are not twenties, we might then agree that an immense amount of bookkeeping would be saved if net prices could be protected against the inroads of discounts for prompt cash, but that is probably as deep down in human nature as giving back a shilling for good luck when one sells a pig.

FRUIT INVESTIGATIONS AT LONG ASHTON.[1]

THE report of the Agricultural and Horticultural Research Station of the National Fruit and Cider Institute, Long Ashton, near Bristol, gives a record of the work done during the year and the changes in organisation brought about as the result of the war. Fortunately, the investigations still continue, though much of the time of the staff is devoted to the work of the Food Production Department; and, still more fortunately, arrangements are in progress whereby the station will be able further to develop after the war. On its establishment in 1903 the station had to be content with 15 acres of land; since that date the area has gradually expanded until at the beginning of this year it was 28½ acres. Most of the land, however, is now planted up with fruit or covered with buildings, and no new experimental work requiring land could be undertaken at the station itself. An opportunity for increasing the area of available land has recently occurred, and arrangements have been made whereby this is to be extended to 53 acres, while an option has been secured that will enable another 200 acres to be taken over if necessary. The director is to be congratulated on having made these arrangements for future developments.

The report consists of a series of papers by the director, Mr. B. T. P. Barker, and the staff, Messrs. Otto Grove, G. T. Spinks, A. H. Lees, and C. T. Gimingham. The subjects are varied; there are several pathological papers dealing with diseases or pests of fruit-trees, one on apple stocks, and another on cider-apple jelly. The production of jelly from apples involves many interesting problems, the chemistry of which is not fully understood. Cider apples and perry pears are not normally used for food in this country except in times of scarcity, when certain varieties are taken by the jam-makers, and to a less extent for dessert and cooking purposes. In the case of apples only the "sours" are used in this way, the "sweets" and "bitter-sweets" being exclusively reserved for cider. The "sours" contain a good deal of malic acid, the amount exceeding 0·45 per cent. in the juice; they yield a jelly without difficulty. The "sweets" and "bitter-sweets" have hitherto proved unsuitable for jelly-making, but Mr. Barker has now fortunately discovered the proper conditions for manufacture. The juice is first extracted, and is then concentrated in a Kestner evaporator until the malic acid constitutes between 1 and 1·5 per cent. of the whole; then sugar is added until the total quantity present amounts to 65 per cent. In practice a certain amount of blending of juices is desirable, so as to ensure that the proper concentration of malic acid shall be readily obtained. It is, of course, possible to obviate any addition of sugar by carrying the evaporation far enough; in this case it would have to go to one-seventh of the original value of the juice, the average sugar content of which is about 10 per cent. On the whole, it is found cheaper to add the sugar.

A prolonged investigation is being made into the various "stocks"—the seedling trees on which grafts are grown. Of these "stocks" there are great

[1] Annual Report of the Agricultural and Horticultural Research Station National Fruit and Cider Institute, Long Ashton, Bristol, 1917.