The Council has ordered the following Report and Table to be printed in the Journal.

Revised Table of Atomic Weights for 1929.

THE annual publication by the International Committee on Atomic Weights of their revised tables of atomic weights, esteemed by chemists as authoritative estimates of the most probable values, ceased with the issue of the table for 1921 by F. W. Clarke, T. E. Thorpe, and G. Urbain (J., 1920, **117**, 885). In 1925 a table prepared by the International Committee on the Chemical Elements, appointed by the International Union of Pure and Applied Chemistry, was published (J., 1925, **127**, 913), but since then no revised table of atomic weights has been published in Great Britain. Therefore, to meet a general need, the Council of the Society appointed a Sub-Committee on Atomic Weights to prepare a revised table for 1929.

Because so long a period has elapsed since the last revision, the task of the Committee has been unusually heavy and has involved a detailed examination of the very considerable amount of work published on atomic weights since 1919, to review which adequately here is hardly practicable. Fortunately this is unnecessary, as the data have been adequately summarised both in the Annual Reports of the German Commission on Atomic Weights published in the *Berichte*, and in the Reports by Professor G. P. Baxter published annually in the *Journal of the American Chemical Society*. We proceed, therefore, simply to outline the main principles governing the preparation of the new table.

The whole of the work on atomic weights published up to 1919 was very thoroughly discussed by F. W. Clarke in his " Recalculation of the Atomic Weights," published by the Smithsonian Institution in that year. Being satisfied that Clarke's method of computation from the available data is sound and trustworthy, we have adopted his final values for those elements, 36 in number, for which no determinations have since been published. These elements are as follows :

Li Mg S Ca V Cr Mn Kr Rb Sr Nb Mo Ru Rh Pd In Xe Cs Ba
Ce Pr Nd Eu Gd Tb Yb La Ta W Os Ir Pt Au Tl Nt Ra

Clarke's figures for the other elements have been modified in accordance with more recent work to obtain the values now given.

For the nine " simple " elements H, He, C, N, F, Na, P, As, and

I the values obtained by F. W. Aston with his new mass-spectrograph are adopted in preference to those deduced from the "physical" or "chemical" data, because we are of opinion that, in these cases, Aston's method is less liable to error than any other. This opinion is strengthened by the agreement observed between the measured and the calculated differences of these values from whole numbers (see "packing-fractions"; F. W. Aston, *Proc. Roy. Soc.*, 1927, **A**, **115**, 487), and their adoption is further justified by the consideration that it does not materially alter the figures deduced by other methods save in one case, that of phosphorus, where the "chemical" data are discordant and obviously unsatisfactory.

In recent years the fundamental importance of the atomic numbers has become so apparent that the present table gives the elements in the order of those numbers. This has the advantage of permitting the inclusion of those elements which are as yet undiscovered and also the known elements for which no determinations of atomic weight are available. It is felt that in so short a list no difficulty should arise in finding an element by name when that is necessary.

Where definite information is available the mass-numbers of the known isotopes of the elements are also given, in the order of their abundance as deduced from the relative intensities of the lines in the mass-spectrum.

In stating the atomic weights use has been made of the convenient device of writing the last figure as a subscript in those cases where it may be in error by two or three units. Where the last figure is not differentiated it is to be understood that in our opinion the error probably does not exceed one unit.

(Signed) F. W. Aston.
H. V. A. Briscoe.
R. Whytlaw Gray.
E. K. Rideal.

1929.

ATOMIC WEIGHTS.

Where the last figure of an atomic weight may be in error by several units it is given as a subscript figure. Where the last figure is given in ordinary type its error probably does not exceed one, or at most two, units.

Atomic number.	Name.	Symbol.	Atomic weight.	Mass-numbers of isotopes in order of intensity.
1	Hydrogen	H	1·0078	1
2	Helium	He	$4·002_2$	4
3	Lithium	Li	6·94	7, 6
4	Beryllium	Be	9·02	9
5	Boron	B	10·83	11, 10
6	Carbon	C	$12·003_6$	12
7	Nitrogen	N	14·008	14
8	Oxygen	O	16·0000	16
9	Fluorine	F	19·00	19
10	Neon	Ne	20·18	20, 22, 21
11	Sodium	Na	23·000	23
12	Magnesium	Mg	24·30	24, 25, 26
13	Aluminium	Al	$26·97_0$	27
14	Silicon	Si	$28·0_8$	28, 29, 30
15	Phosphorus	P	$30·98_2$	31
16	Sulphur	S	$32·06_5$	32, 33, 34
17	Chlorine	Cl	35·457	35, 37
18	Argon	A	39·94	40, 36
19	Potassium	K	$39·10_5$	39, 41
20	Calcium	Ca	40·09	40, 44
21	Scandium	Sc	$45·1_5$	45
22	Titanium	Ti	47·90	48
23	Vanadium	V	50·95	51
24	Chromium	Cr	52·04	52
25	Manganese	Mn	54·95	55
26	Iron	Fe	55·84	56, 54
27	Cobalt	Co	58·95	59
28	Nickel	Ni	58·69	58, 60
29	Copper	Cu	63·55	63, 65
30	Zinc	Zn	65·38	64, 66, 68, 67, 65, 70, 69
31	Gallium	Ga	69·72	69, 71
32	Germanium	Ge	72·60	74, 72, 70, 73, 75, 76, 71, 77
33	Arsenic	As	$74·93_4$	75
34	Selenium	Se	79·2	80, 78, 76, 82, 77, 74
35	Bromine	Br	$79·91_5$	79, 81
36	Krypton	Kr	82·9	84, 86, 82, 83, 80, 78
37	Rubidium	Rb	$85·4_3$	85, 87
38	Strontium	Sr	$87·6_3$	88, 86
39	Yttrium	Yt	$88·9_3$	89
40	Zirconium	Zr	91·2	90, 94, 92, (96)
41	Niobium (Columbium)	Nb (Cb)	93·3	
42	Molybdenum	Mo	96·0	
43	Masurium	Ma	—	
44	Ruthenium	Ru	$101·6_5$	
45	Rhodium	Rh	102·9	
46	Palladium	Pd	106·7	
47	Silver	Ag	107·880	107, 109

Atomic number.	Name.	Symbol.	Atomic weight.	Mass-numbers of isotopes in order of intensity.
48	Cadmium	Cd	$112{\cdot}4_0$	114, 112, 110, 113, 111, 116
49	Indium	In	114·8	115
50	Tin	Sn	118·70	120, 118, 116, 124, 119, 117, 122, 121, 112, 114, 115
51	Antimony	Sb	121·76	121, 123
52	Tellurium	Te	127·5	128, 130, 126
53	Iodine	I	$126{\cdot}93_2$	127
54	Xenon	Xe	130·2	129, 132, 131, 134, 136, 128, 130, 126, 124
55	Cæsium	Cs	$132{\cdot}8_1$	133
56	Barium	Ba	$137{\cdot}3_6$	138
57	Lanthanum	La	$138{\cdot}9_0$	139
58	Cerium	Ce	140·2	140, 142
59	Praseodymium	Pr	140·9	141
60	Neodymium	Nd	$144{\cdot}2_5$	142, 144, 146, (145)
61	Illinium	Il	—	
62	Samarium	Sm	$150{\cdot}4_3$	
63	Europium	Eu	152·0	
64	Gadolinium	Gd	157·0	
65	Terbium	Tb	159·2	
66	Dysprosium	Dy	$162{\cdot}4_6$	
67	Holmium	Ho	163·5	
68	Erbium	Er	167·6	
69	Thulium	Tm	169·4	
70	Ytterbium	Yb	$173{\cdot}_0$	
71	Lutecium	Lu	$175{\cdot}_0$	
72	Hafnium	Hf	178·6	
73	Tantalum	Ta	181·3	
74	Tungsten	W	184·1	
75	Rhenium	Re	—	
76	Osmium	Os	$191{\cdot}_0$	
77	Iridium	Ir	$193{\cdot}0_4$	
78	Platinum	Pt	195·2	
79	Gold	Au	$197{\cdot}2_1$	
80	Mercury	Hg	$200{\cdot}6_0$	202, 200, 199, 198, 201, 204, 196
81	Thallium	Tl	$204{\cdot}_3$	
82	Lead	Pb	$207{\cdot}2_2$	208, 206, 207
83	Bismuth	Bi	$209{\cdot}0_0$	
84	Polonium	Po	—	
85	—	—	—	
86	Niton (Emanation)	Nt (Em)	222	
87	—	—	—	
88	Radium	Ra	$225{\cdot}9_5$	
89	Actinium	Ac	—	
90	Thorium	Th	232·15	
91	Protoactinium	Pa	—	
92	Uranium	U	$238{\cdot}1_5$	