into the hands of students who have but little time to spare and may not intend to become professional chemists, a very wide analytical field is got over; indeed a little too much is attempted in the space, and sacrifices have in nearly all cases to be made where "shortness and simplicity" is the combined ruling idea.

We fully agree with what the author says as to the educational value of quantitative analysis. It is indeed high time that our more elementary students should have the long courses of qualitative analysis shortened, and some more *exact* exercises substituted.

In the course of the 127 pages of this book, including six for tables, we are introduced to the balance, and it is much to be regretted that more has not been said about it. What is said is purely practical—how to turn up the handle and put on the weights.

The first exercises are the determination of water in a carbonate and the ash in several substances, after which a couple of specific gravity methods are given, and then we pass to "simple gravimetric analysis," iron, silver, barium, lead, &c. In the silver exercise the factor 0·75276 is introduced to get the actual silver from the weight of chloride found, and this "factor" is given in all other analyses. It is not of much use any way, and for beginners it is not advisable, as it binds them down to the book, and no appreciable time is saved for ordinary analysis calculations.

The directions for volumetric analysis are very good, and the exercises are well arranged in order of difficulty. The separation exercises and miscellaneous examples will need some attention from the teacher.

In the description of organic analysis—combustion of carbon compounds—the closed-tube process is well described, and a student might be able to do a combustion from the description only; but we are not informed, when the open tube is spoken of, whether the same length, viz. 18 inches, will be sufficient or not. By inference it will. We venture to say that a very doubtful analysis, especially of a volatile body, would result from the use of an open tube only 18 inches long. The description here is much too slight to work by.

The tables at the end are sensible—only just those wanted in the course of the work in the book itself.

Qualitative Chemical Analysis. By Dr. C. Remigius Fresenius. Tenth Edition. Translated and edited by Charles E. Groves, F.R.S. (London: J. and A. Churchill, 1887.)

THE fifteenth German edition of this well-known book contains many emendations and additions, especially in the concluding portions devoted to the reactions of the alkaloids and the systematic methods of detecting them. Of this edition of the original work the present edition of the English translation is as nearly as possible an exact reproduction, and much credit is due to the translator and editor for the care with which he has accomplished a very difficult task. Various styles of type and other typographical improvements have been introduced, in the hope, as Mr. Groves explains, that the book may thereby be rendered more handy and useful to students.

Melting and Boiling Point Tables. Vol. II. By Thomas Carnelley, D.Sc., and Professor of Chemistry in University College, Dundee. (Harrison and Sons, 1887.)

THE issue of vol. ii. of this important work completes it. It is not too much to say that these two volumes will be found in every laboratory. Their compilation represents an amount of patient work from which most men would have recoiled; and the total result, which has cost ten years of effort, reflects the highest credit upon Prof. Carnelley.

Part II., dealing with organic compounds, brings the data down to 1885.

Part III. deals with vapour tensions and boiling points of simple substances, and freezing and melting points of cryohydrates, including facts recorded in 1886.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

The Law of Error.

EVERYONE interested in the theory of statistics is aware how strongly Quetelet was under the conviction that there is only one law of error (or curve of facility, to use the corresponding expression for the graphical representation of the law) prevalent for the departure from the mean of a number of magnitudes or measurements of any natural phenomenon. I have done what I can to protest against this doctrine as a theoretic assumption; and recently Mr. F. Galton and Mr. F. Y. Edgeworth have shown in some very interesting and valuable papers in the *Philosophical Magazine* and elsewhere how untenable it is, and how great is the importance of studying the properties of other laws of error than the symmetrical binomial, and its limiting form the exponential.

I have been making some calculations recently, principally in the field of meteorology, and I should be extremely glad of the

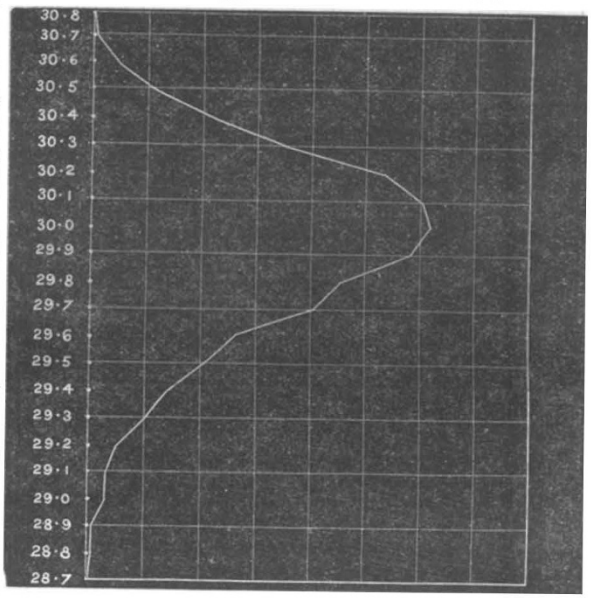

FIG. 1.

judgment and criticism of any of your readers who may be better versed in this science than myself. It must be carefully understood that the questions here raised are solely these:—(1) Do the magnitudes, when arranged in order of their departure from the mean, display a *symmetrical* arrangement? (2) If so, is this arrangement in accordance with the binomial or exponential law?

The first diagram represents the grouping, in respect of relative frequency, of 4857 successive barometric heights. They are from the observations of Mr. W. E. Pain, of Cambridge, and show the readings at 9 a.m. on successive mornings for about thirteen years from January 1, 1865. They are the results of the same instrument, which has required no correction or alteration during that period. They are given to the first decimal place.

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