

necessity for systematic inquiry into its processes became obvious in this country. The publication of Dr. F. Kick's supplement to his treatise "Die Mehlfabrication," which tabulated the improvements in machinery for preparing and grinding cereals introduced up to the year 1883, placed at the disposal of the translator a manual complete in its investigations into the nature of grain from the miller's technical standpoint, and into the best means of reducing it to flour. It is true that the book does not concern itself with the construction of the mill building nor with the motive power to be employed; but, from this point onward, the leading principles which should guide the milling engineer are carefully and accurately related, and their application justified when necessary by mathematical demonstration; the *rationale* at the same time being within the comprehension of the practical miller. Of this method the chapters on "balancing millstones" (p. 113), and on "disintegrators" (supplement, p. 25), afford admirable examples. The various operations of grain preparation, grinding, and of bolting, sifting, and dressing the meal, with descriptions and plates of the best known machines employed, are fully detailed, whilst the controversy between the advocates of "high" milling and "low" milling is discreetly adjusted by the author in the incidental remark that "which of these methods is to be used can only be settled by the local demand, if, as is generally the case, the mill works for the home market."

It is, however, to those portions of the work which relate to roller-mills that the reader at the present time will probably turn in the first instance. He will find here, not only information as to the various kinds in use and as to the manner in which they have been found to perform their work, but an intelligible account of the operations involved in the reduction of cereals by rollers, and good reason shown why the time honoured millstones have become almost entirely discarded in the manufacture of wheaten flour.

The book is very fully illustrated by woodcuts throughout the text, and by some thirty supplementary sheets of diagrams; whilst a preliminary chapter contributed by Dr. August Vogel, of Vienna, on the histology of farinaceous grains, adds completeness to the work.

We congratulate the translator on his introducing to the English reader a volume of the utmost value to millers and engineers, and of great interest to many other persons more or less concerned with this important industry.

Elements of Chemistry: a Text-book for Beginners. By Ira Remsen. (London: Macmillan and Co., 1887.)

OPINIONS no doubt differ much as to what is simple enough for a beginner. A good deal depends on the age of the beginner. We hold, in opposition to the author in his preface, that the present production is not well adapted for very young pupils.

There is a good deal of promise in the book which might be better fulfilled, and there is an attempt to cover far too large a field, with the result—not intended by the author—that it reads more like a book on general chemical information than an elementary introduction to chemistry.

Metals and non-metals are dealt with under "family" groups, and most of their common, and many uncommon, compounds described, generally with formulæ, and this in cases and with equations which cannot be termed simple; for instance, technical processes like soda-making, or bleaching powder, or potassium chlorate, or nitro-benzene, &c. Otherwise the order and arrangement of matter and the questions attached to each section are most excellent, and the book would be most useful even for general reading, exercise, and information on the chemistry of common things to the great mass of partially informed, ordinarily well educated, people of any age. To the senior boys of public schools, who have already had a little instruction

in science, this book would be really useful, as taking them in a different manner over ground already partially covered, widening their general knowledge, and cultivating the main thing, "*thinking*."

A Primary Geometry, with Simple and Practical Examples in Plane and Projection Drawing, and suited to all Beginners. By S. E. Warren, C.E. (New York: Wiley and Sons; London: Trübner, 1887.)

THIS work bears as motto, "Geometry should be begun as early and as simply in behalf of industrial life as arithmetic is in behalf of business life"; and its object is, accordingly, to contribute to a general earlier beginning of the study of geometry. "The truths of *form*, as needed in *drawing*, have been made prominent, while not neglecting elementary ones of *measure*."

The text treats of straight lines, triangles, regular figures, areas, lines and planes in space, the elementary bodies, and projections of elementary solids, the subject being considered in a common-sense fashion without much use of purely geometrical proofs. Having perused a very large portion of his book without detecting any flaw, we consider the author competent for the task he has undertaken, but we do not take kindly to such presentments of geometry. We believe, however, the book to be well adapted to junior pupils as an introduction to the study, and also to artisans and others who are likely to be able to grasp the illustrations given better than they would purely geometrical proofs for which their antecedents have not prepared them.

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 Duke of Argyll's Charges against Men of Science.

I REGRET to find that the Duke of Argyll has once more evaded the point at issue. The question is one not of *formulas* but of *facts*. If the statements upon which his Grace bases the severe strictures of his "Great Lesson" were true, I for one should take no exception to any "metaphorical or rhetorical expression" by which he chose to enforce his lesson.

Three months have elapsed since the Duke's attention was directed to the discussions which during the last seven years have taken place upon the subject of Mr. Murray's theory of coral reefs—and especially to that one in which the Director-General of our Geological Survey, and the most eminent of American geologists, Prof. J. D. Dana, bore the leading parts; the Duke has been referred to the scientific journals in which this and the other discussions have been carried on; and the fact has been pointed out to him that all the principal text-books of geology, foreign as well as British, which have been published since the theory was announced, have given it a prominent position in their pages. In the face of these facts, is the Duke of Argyll still prepared to maintain that, with respect to the theory in question, there has been "a grudging silence as far as public discussion is concerned"; that there has been "a silence of any effective criticism"; and that "no serious reply has ever been attempted"? If his Grace admits that he was mistaken in making these assertions, is he prepared to withdraw them and also the comments which he has based upon them?

Instead of doing anything of the kind up to the present, the Duke of Argyll has fathered two stories about the wrong-doings of geologists—both of which stories have as little foundation in fact as his statements in "the Great Lesson."

The first of these stories is related in very circumstantial terms, but without any authority being given for it. It is said that a Fellow of the Geological Society offered a certain paper, which the authorities of the Society refused; and it is asserted that the reason of their refusal was that the paper "was not orthodox," and "they probably smelt heresy." Now the Duke of Argyll is well aware that every Fellow of the Geological Society has the right to present papers for reading, and that the responsibility for accepting or refusing papers rests in the first instance with the President; but he, in the case of exercising his veto, is bound to report the fact, and the reasons for his action, at the next meeting of the Council. The records of the Society show that no such paper was ever offered to it; that the President never exercised his right of veto; and that the Council never discussed the grounds of the supposed refusal. The Duke of Argyll has been informed of these facts, but he has not yet retracted the very serious charge which he has made affecting the honour and good faith of the President and the other twenty-two members of the Council of the Geological Society.

In the case of the second story circulated by the Duke of Argyll, the authority is given. The complaint is made that since 1862 "advanced geologists" have "ignored" views which "tend to dethrone" their own "pet theories." Anyone who chooses to refer to the *Philosophical Magazine* for 1862 will see that the "pet theories" in question are those relating to the antiquity of man; that the "advanced geologists" implicated in the charge must have been the late Sir Charles Lyell, Prof. Prestwich, and those who have followed up their researches and arguments; and that the "views" which they "ignored" were the suggestions which I described in my last letter!

JOHN W. JUDD.

The Total Eclipse of the Moon of 1888 January 28, as observed at Birr Castle Observatory, Parsonstown.

THE total eclipse of the moon on Saturday last was, like its predecessor in 1884 (see *NATURE*, vol. xxx. p. 589, and *Trans. Royal Dublin Society* for October 1885), favoured by a very clear sky during the whole time of its progress, so that very extensive observations of the changes of the moon's heat in consequence of the passing over of the earth shadow could be made. The apparatus used was essentially the same as that used before; yet the two old thermopiles had been replaced by two new ones especially made for this occasion by the Earl of Rosse.

The observations began at 7h. 19m. M.T. Greenwich, and were, as much as possible, uninterruptedly continued till 15h. 45m.

During this time 638 distinct readings of the galvanometer were obtained, which, when fully reduced, will enable a very satisfactory heat-curve to be drawn. A few preliminary results, reduced to zenith, I communicate at once.

Galvanometer.

739.4	...	1h. 10m. before first contact with penumbra.	
663.4	...	24m. "	"
624.1	...	First contact with penumbra.	"
252.1	...	" shadow.	"
34.9	...	22m. before beginning of total phase.	"
30.2	...	22m. after "	"
231.9	...	Last contact with shadow.	"
545.6	...	" penumbra.	"
540.8	...	1h. 34m. after last contact with penumbra.	"

From these figures it will be seen—

(1) That the heat radiated by the moon begins to decrease a considerable time before the first contact with the penumbra.

(2) That 22m. before the beginning of totality the heat is only 4.7 per cent. of the value obtained 1h. 10m. before the first contact with the penumbra. Unfortunately an unforeseen stoppage of the driving-clock prevented the observations from being carried on closer up to and during the total phase.

(3) That in spite of the rapid fall on approach to totality, the heat, after the last contact with the penumbra, does not at once increase to anything like the value observed at corresponding times before the first contact.

It is worth remarking that points 2 and 3 are confirmatory of the results arrived at in 1884.

OTTO BOEDICKER.

Birr Castle Observatory, Parsonstown, January 30.

"Elementary Chemistry," and "Practical Chemistry."

I CRAVE leave from the Editor for space in which to reply, on my own behalf and on that of my fellow-authors Messrs. Slater and Carnegie, to the charges brought by "H. E. A." in *NATURE* of January 19 (p. 265) against our method of teaching chemistry. At the outset I thank "H. E. A." for the patience which, as he publicly announces, he has shown in waiting for the publication of these books, and I condole with him in his disappointment. Like him, I too am waiting patiently; I trust my disappointment will be less bitter.

One of the important points in our plan of chemical teaching is the connection of the work in the laboratory with the student's reading and lecture-work. To emphasize this connection, and to make our course run fairly smoothly, we have published two books, one to be used in the laboratory, the other to be used in the lecture-room and in reading in connection with the whole work of the student. "H. E. A." acknowledges the advantages of this division, but throughout his review he ignores the statement distinctly made by us, that one book is complementary to the other and that both must be used together. He confines his remarks almost wholly to one of our books, viz. the "Practical Chemistry"; and yet he condemns our system of teaching. On this ground alone I claim that his review is misleading and unfair. I go further, and assert that "H. E. A." has condemned our system without acquainting himself with its essential features. He says that "in the earlier part of the 'Practical Chemistry' Messrs. Muir and Carnegie do not sufficiently bear in mind their own intention, and that much of the matter would find a more fitting place in the companion volume." No one reading this would suppose that almost every experiment used in Chaps. I. to VIII. of the "Practical Chemistry" is also used in Chaps. I. to IX. of the "Elementary Chemistry." Yet this is the case. In one book the experiments are described, along with others, in such terms as allow attention to be concentrated on their results and on the reasoning on these results; in the other book the experiments are described in detail in order that the student may repeat them in the laboratory. In another part of his review "H. E. A." says that most of the subjects dealt with in the third part of the "Elementary Chemistry" "ought never to have been introduced into an 'Elementary Chemistry.'" He has here made a slip: it is the third part of the "Practical Chemistry" which includes subjects not touched on in the other book. This correction involves a point of some importance. Although the preface to our "Practical Chemistry" states that the book forms part of a course of elementary chemistry, yet the student who uses both books will see that the course of work laid down in the practical book carries him much beyond the limits of treatment adopted in the other volume. There are numerous direct and indirect indications of this in the book itself, which those for whom the work is intended will not fail to notice. One cannot put the whole of one's book into the preface. I admit that it would have been better had we indicated in the preface to the "Practical Chemistry" that many experiments in Parts II. and III. are difficult to perform, and require skill and training; but I assert that the nature of the experiments themselves, the references to the original papers to be read before conducting these experiments, and the suggestions as to other work to be done preparatory to Parts II. and III. respectively, suffice to indicate to the student, although not necessarily to the reviewer, the character of the work described in the later chapters of the "Practical Chemistry."

Chapter I. of Part III. of the "Practical Chemistry" involves a repetition of some of Stas's determinations of the atomic weight of silver. "H. E. A." says that this chapter should have been included in Part I., and he adds, "the remaining chapters ought never to have been introduced into an 'Elementary Chemistry,'" kindly informing his readers that these chapters are included "because of the senior author's well-known tendency to worship physical constants." I venture to remind "H. E. A." that no election has taken place to the office of supreme pontiff of chemistry. Were that official in existence, I feel inclined to think he would admit that accurate determinations of atomic weights—and "H. E. A." allows these in the most elementary part of the course—are determinations of constants which have physical as well as chemical meanings.

"H. E. A." says that in the "Practical Chemistry" there is an "entire absence of anything approaching to a systematic arrangement." The boldness and baldness of the assertions made by the reviewer encourage me to meet this statement with