SATURDAY, DECEMBER 27, 1879.

ERASMUS DARWIN.

IN spite of the easy flow of his rhythm, the bold flights of his imagination, and the attractiveness of his speculations, it is certain that Erasmus Darwin's *Botanic Garden* is now-a-days but little read. At the time of its publication, those who could appreciate the method of the poet could ill understand his subject. For this reason it was that the ludicrous aspect presented by the amorous proclivities of the members of the Monandrian, Diandrian, and of the rest of the Linnæan groups, combined with the reciprocal tenderness of the corresponding Monogynian and Digynian harems excited a keen sense of the ridiculous, under which the real merits of the book were all but extinguished by that very "muse of mimicry" himself invoked. Nevertheless, the few who could understand the Doctor's speculations and appreciate the value of the "philosophical notes" appended to the poem, must have felt that the writer was no ordinary man, even among the learned physicians and naturalists of his day. Those notes indeed have been to our knowledge as much read and appreciated by some as the *Amœnitates Academicæ* of Linnæus, and for similar reasons. On looking at them again in the light of the great advances made in the last quarter of a century the conviction of Erasmus Darwin's intellectual power becomes stronger than ever. More than ever does it become clear that he was far in advance of his age. Speculations which must to his contemporaries have seemed wild flights of fancy have shaped themselves now-a-days into what would be called rational theories, and in some cases into accepted facts, as in the following instance :—

> "Soon shall thy arm, unconquered Steam, afar
> Drag the slow barge or drive the rapid car."

What his own views were as to the use of speculation in natural science is clearly shown in the "apology" which he wrote by way of preface to his *Economy of Vegetation* :—

> "It may be proper here to apologise for many of the subsequent conjectures on some articles of natural philosophy, as not being supported by accurate investigation or conclusive experiments. Extravagant theories, however, in those parts of philosophy where our knowledge is yet imperfect, are not without their use, as they encourage the execution of laborious experiments, or the investigation of ingenious deductions to confirm or refute them. And since natural objects are allied to each other by many affinities, every kind of theoretic distribution of them adds to our knowledge by developing some of their analogies."

It is clear, then, that Erasmus Darwin treated his theories and speculations as such flights of the imagination should be treated, viz., as a scaffolding, by means of which one may gain an idea of the nature and mode of construction of an edifice, but which should not be confounded with the edifice itself. Our attention has been called to this matter by the recent publication of a sketch of the life and work of Erasmus Darwin,* prefaced by fuller biographical details than were accessible to the original writer, from the pen of Charles Darwin. Most interesting is it to see the same general line of thought pervading the writings of grandsire and grandson ; but apart from other considerations there

* *Erasmus Darwin*. By Ernst Krause. Translated from the German by W. S. Dallas, with a preliminary notice by Charles Darwin. (Murray.)

is this difference, that the elder Darwin pursued the deductive plan, the younger the inductive mode of work. Of course this is true only in a general sense, but we have comparatively few indications in the writings of the elder Darwin of that patient experiment, laborious accumulation and consummately skilful marshalling of detail which are so conspicuous in the works of Charles Darwin.

We cannot in this place enter at any length into what we may call the life history of the celebrated physician. The narrative devoted to it in the volume before us is full of interest, and even could we afford the space it would not be fair to the book—a small one—to make many lengthened extracts from it. We may, however, quote the following story as illustrative of the reputation that Dr. Darwin enjoyed among his professional contemporaries, and also because it serves to substantiate an old story told of many others, but which, according to the written statement of his daughter, pertains of right to Erasmus Darwin. "A gentleman in the last stage of consumption came to Dr. Darwin at Derby, and expressed himself to this effect: 'I am come from London to consult you as the greatest physician in the world, to hear from you if there is any hope in my case; I know that my life hangs upon a thread, but while there is life there may be hope. It is of the utmost importance for me to settle my worldly affairs immediately; therefore, I trust that you will not deceive me, but tell me without hesitation your candid opinion.' The opinion was given, and a very unfavourable one it was; and the physician in giving it said to his patient, 'But as you come from London, why did you not consult Dr. Warren—so celebrated a physician?' 'Alas! Doctor,' was the reply, 'I am Dr. Warren.'"

We have already cited one illustration of the Doctor's foresight, and many more might be mentioned. "A few years since a utilitarian philosopher might have sneered at men spending their lives in the examination of organisms far too minute to be seen by the naked eye, and it would have been difficult to have given a satisfactory answer, except on general principles, to such a man. But we know, from the researches of various naturalists, how all-important a part these organisms play in putrefaction, fermentation, infectious diseases, &c.; and, as a consequence of such researches, the world owes a deep debt of gratitude to Mr. Lister for his antiseptic treatment of wounds." In this connection Erasmus Darwin's statement is noteworthy: "I hope that microscopic researches may again excite the attention of philosophers, as unforeseen advantages may probably be derived from them, like the discovery of a new world."

As the inventor, or at least suggestor of numerous mechanical apparatus—lamps, looms, artesian wells, flying-machines, pumps, carriage-springs, a speaking machine—Darwin seems to have been remarkable. He had—what in the last century must have been rare indeed—a speaking-tube in his study, "which opened near the back of the kitchen fireplace. A countryman had brought a letter, and sat waiting for an answer by this fire, which had become very low, when suddenly he heard a sepulchral voice saying, as if from the depths of the expiring fire, 'I want some coals.' The man instantly fled from the house, for my grandfather had the reputation amongst the countryfolk of being a sort of magician." That similar terror is still inspired, ay, even in the metropolis, by the use of the speaking-tube, any medical man we imagine can testify.

The idea of the gradual evolution of organic beings suggested itself to Erasmus Darwin, as it had done to others, from the observation of the gradual evolution of the young animal or plant from its egg or seed, or from a "living filament which The Great First Cause endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations, and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end."

The notes to the *Botanic Garden* and other poems are to our thinking by far the most valuable portion of the book, and we do not think it would be difficult from internal evidence to show that the author himself attached the greater importance to them. The author was the contemporary and friend of Priestley, the first to give true notions as to the interchange of gases in the leaf. Darwin bids the "pellucid forms"

> "Guard the coy blossom from the pelting shower,
> * * * * * *
> From each dull leaf the silvery drops repel,
> And close the timorous floret's golden bell;"

and in a note tells that the upper side of the leaf is the organ of vegetable respiration, and at the time when the elimination of oxygen was considered to be the true respiratory process in plants this statement was appropriate enough.

In the note to the following passage—

> "While in bright veins the silvery sap ascends,
> And refluent blood in milky eddies bends,
> While spread in air the leaves respiring play,
> Or drink the golden quintessence of day"—

we have the account of an experiment on the circulation of coloured fluids in the leaf, and of a milky fluid—the latex—which he compares to the venous blood, anticipating in this particular the views of Trécul.

The nectary in flowers is "formed in some flowers for the preservation of their honey from insects, as in the Aconites or Monkshood; in other plants, instead of a great apparatus for its protection, a greater secretion of it is produced, that thence a part may be spared to the depredations of insects." In some sense this is an anticipation of Kerner's views on the means which some plants have of protecting themselves against unwelcome visitors. The idea at least is even more clearly brought out in the following passage relating to the Cypripedium, the similitude of which flower to a great spider "seems to be a vegetable contrivance to prevent the humming-bird from plundering its honey," and other illustrations of a similar kind are given, especially in the notes, relating to vegetable glandulations.

Cross-fertilisation did not escape his notice, as may be seen in the note on Collinsonia, where the styles of one flower had bent themselves into contact with the males of other flowers of the same plant in the vicinity of their own.

We shall be surprised if the perusal of this interesting little volume does not send many a reader to the *Botanic Garden*, and lead him to the conclusion that the ridicule it excited did harm by calling attention from the many indications of real genius which it contained.

THE HOLLY.

A CHRISTMAS CHANT.

Now, of all the trees by the king's highway,
Say which do you love the best?
Oh, the one that is green on Christmas Day,
The bush with the bleeding breast.

It's leaves are sweet with our Saviour's name;
'Tis a plant that loves the poor;
Summer and winter it shines the same
Beside the cottage door.

'Tis a bush the birds will never leave:
They sing in it all day long;
But sweetest of all upon Christmas Eve
Is to hear the robin's song.

So of all that grow by the king's highway,
I love that tree the best;
'Tis a bower for the birds upon Christmas Day,
The bush with the bleeding breast!

Slightly altered from the original, by the Rev. R. S. Hawker.

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