sometimes, as in the story of his early struggles while a student at Upsala, and again at the period of his courtship and his absence from the object of his affections, with the air of the hero of a romance rather than the subject of sober biography. It was to be expected that such periods in his life-history would properly take forcible hold of the sympathies of a lady biographer. It may be said at once that the author has carefully consulted the proper authorities —Stoever, Pulteney, Smith, Jackson, &c., and duly acknowledged her indebtedness to them ; and occasionally, with more jubilation than mere complacency, her disregard for them when they fail by disagreement among themselves, or otherwise, to satisfy her. One can hardly say fairer than that The first impression of the book is unfavourable ; in fact, it is felt that one cannot take it seriously. That it is not meant to be so taken altogether is manifest from such statements as that "by Hök rather than by Krök Carl's name was enrolled," &c. Apart from this kind of thing, however, there is often a temptation to smile at the wrong places. The author's observations on men and things in general are frequent and fearless. For example, in discussing an architectural matter she wonders at "the usually perceptive Fergusson" not recognising the significance of a feature well known to ordinary writers on Swedish architecture. Doubtless Mr. Fergusson would have valued this gentle way of describing him, so unlike the manner of those "cock-a-hoop and overbearing young scientific men" whom the author prophesies will be "charming at forty." There is a superabundance too of quotations in the book beyond the legitimate quotations from Linnæus himself and writers of his life. Indeed, to put it in the fashion of that biographer of Linnæus whom she calls "dear old Stoever," she can rarely keep her course clear of the Scylla of her own wisdom and the Charybdis of miscellaneous quotations from Carlyle and a great variety of other writers.

The ancestors of Linnæus, his life from boyhood and school-days, throughout his University career, are discussed with picturesque descriptions of the land and the people. We then come to his *début* in the treatise on the sexes of plants, in answer to Wahlin's "Nuptiæ Arborum Dissertatio." "This," we are told, "was a blooming new idea in the summer of 1730." He is then followed throughout his travels in Lapland, Dalecarlia, his fruitful visits to Holland, England, and France, his return to Sweden and career at home, including his subsequent journeys—to the end. The following passage will give a fair illustration of the style of the more extravagant passages in the book :—

"Linnæus broke down : he dropped like the begonia at the last—the flower that had always interested him so much, with its male and female flowers so graceful and so differing. The common begonia, that most interesting and elegant of plants, is jointed all the way up, and as it withers the joints become separated and in shape like the bones of the human limbs ; they drop apart, and fall like dry bones upon the ground. This family is a botanical study in itself. 'Many begonias are remarkable for the production of adventitious buds,'" &c.

In spite of this amazing style it must be owned that apart from such small matters as spelling Linnean, in the name of the Society, "Linnæan," the book is wonderfully correct in the main features of the life of Linnæus, and once the reader is accustomed to absurdities such as we have noted, it becomes a readable narrative. The worst of it is that one is hurried off to somewhere between China and Peru for an illustration of some sober fact, and this without sufficient warning to the unwary reader.

Sur une nouvelle Méthode de faire des Mesures absolues de la Chaleur rayonnante. Par Knut Angström. (Upsal : Berling, 1886.)

IN this quarto pamphlet of seventeen pages (with a plate) the author claims to give a simple method for determining the absolute measure of radiant heat, and describes a self-registering apparatus which gives the intensity of solar radiation at any instant, as also the total heat received by the absorbing surface in a given time. Two circular copper disks are alternately exposed to the source of heat and screened from it, and a thermo-electric couple and galvanometer give the differences of their temperature. The method consists in finding accurately the average *time* for the *temperature-difference* of the two plates to be a given (small) amount, positive and negative in turns. By the aid of Newton's law of cooling, which is applicable in this case, the author proves that the intensity of the radiation is proportional to the temperature-difference directly, and the time inversely, and that it is quite independent of the constant of cooling. To verify the last conclusion, the author measured with an instrument of this kind the radiation of a constant source of heat under varying conditions of cooling, and he found that the influence of cooling was completely eliminated.

In the construction of the self-registering actinometer founded on this principle, the absorbing surfaces are those of a differential thermometer, and the temperature-differences are marked by the movement of a thread of mercury in the communicating glass tube. When the thread has moved a certain distance, corresponding to a known temperature-difference in the two bulbs, an electric circuit is completed, and an electro-magnet turns the instrument through 180°, thus reversing the positions of the screened and unscreened bulbs. By the usual clock-driven pencil and revolving cylinder, a curve is drawn of which the abscissa is proportional to the time, and the ordinate to the number of turns which the instrument has made in the time. It is then shown that at any instant the intensity of the radiation is proportional to the tangent of the angle which the curve makes with the axis of abscissæ, and that the total heat received in a given time is proportional to the difference of the ordinates corresponding to the beginning and end of the time. The constants by which these variables are to be multiplied must be found by comparison with an absolute instrument like that already mentioned, and the necessity for this comparison may prove an obstacle to the general use of the instrument. Notwithstanding this drawback, the author claims for his invention that it gives results in accordance with those of the absolute instrument, and that it works as satisfactorily on stormy days as on calm ones. There is no doubt that the instrument is deserving of a fair trial, and a comparison of the results obtained from it and from some other recent forms of actinometer, would be of great value.

The paper is carefully written and printed, and we have noticed only two unimportant slips : one on p. 9, last line but one, where 40·0 should be 41·0 ; and another on p. 16, line 9, where *plus* should be *moins*. T. H. C.

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.*]

Vitality and its Definition

WHILE warmly congratulating Prof. Judd upon the ability with which he has brought "out into clear relief the analogies between the science dealing with the mineral kingdom and those concerned with the animal and vegetable kingdoms," I cannot but think he has a little understated the difference between organic and inorganic matter. As this has arisen from a misconception of Mr. Spencer's definition of life—a misconception