

It is my conviction that the hypothesis of pangensis, both in its original form and in all its subsequent modifications, has been definitely set aside. In its place we have the theory that the nature of the germ, i.e., of the impregnated ovum of each species, is the same over and over, not because there is in each case a similar collocation of gemmules or plastidules, but because the chromatine perpetuates itself, so that the same kind of chromatine is found in the one generation as in the generations preceding it and following it. *The child is like the parents, because its organization is regulated by not merely similar, but by some of the same, chromatine as that of the parents.* Perhaps, instead of chromatine we ought to say, in order to avoid an unjustifiable explicitness, nuclear substance.

When it is recalled that heredity is one of the fundamental phenomena of life, and that hitherto we have seen no hopeful way leading to its comprehension, we can understand the delight with which biologists welcome the new theory and its rich promises. CHARLES SEDGWICK MINOT.

#### ROSMINI'S PSYCHOLOGY.

THIS is the sixth volume of the translation which Rosmini's English disciples have undertaken to make of his principal writings, — a labor of devotion surely, not only by reason of the mere pains involved, but in view of the probable thanklessness of the English-reading public for whose sake they are all taken. When one thinks of the mere quantity of labor which Rosmini accomplished in his not long life, one cannot refuse to him the title of being one of the very small number of intellectual giants of the world. He is of the race of the Aristotles, the St. Thomases, the Leibnitzes, the Kants, and the Hegels. The mere cogitative energy of him, too, is fully equal to theirs. Every page he writes is filled with thinking as hard, subtle, and original as theirs; and his style is as clear and flowing as theirs is usually the reverse. His learning is prodigious too. In short, he is a miracle of intellectual force, compared with whom a mere reviewer's mind is as a midge against an elephant. But Rosmini is a *dead* giant, and the reviewer can have it his own way with him, because *he* is alive, and writes for readers taught by all their Lockian and Protestant education to treat the kind of thing that Rosmini represents — thoroughgoing, concatenated, and systematic ontologizing and theologizing by the conceptions of principle and term, substance and essence and act — as 'scholastic jargon,' and so to

close their ears. Scholastic jargon, too, it seems to this reviewer; only he has a bad conscience about saying it so shortly, and therewith turning Rosmini over to the disdain of many of our native philistines who at bottom are spiritually unfit to loosen his shoe. The last word has not yet been said about scholasticism. We are all scholastics without knowing it, so sure as we talk of things and acts and essence and force. But we don't elaborate our scholasticism, because Locke taught us that to do so led to no practical use. The only practical gain which accrues to a scholastic from his elaboration of what we all believe, is what Rosmini calls "the experience in himself of a kind of jubilation and felicity, which is so peculiar as to be unlike any other feeling and to bear testimony to its infinite source." This is the rapture of all intellectual order and harmony; but our race would willingly part with it, if only thereby it could buy a new way of peeling potatoes, or of teaching children how to read. We renounce one thing, scholasticism another. It is not that the distinctions made by Rosmini and other scholastics are false. On the contrary, they seem for the most part true. They are one way of seeing and naming the facts of life. But they are sterile: we can deduce from them no immediate practical receipts. To peel potatoes, we must look at other aspects of the world than substantiality and accidentality and the distinction between immanent and transient acts. Many are the aspects of every bit of reality, and all are equally true. But each carries us a different way. By a succession of accidents modern critics and men of science have stumbled on the aspects which lead to the ways of foreseeing and handling particular material events. Together, these aspects form the armament of the scientific and positivistic view of life, a hodge-podge of which we moderns are very proud, but of which, great as the practical fruits are, the speculative dignity leaves much to be desired. Maybe some disciple of Rosmini may show a path down from his categories to the practical details of life. It were sad that such strenuous and in many ways such exquisite thinking as his should be among the mere superfluities of human history. W. J.

#### CLERKE'S HISTORY OF ASTRONOMY.

THIS is in some respects a remarkable book, and takes its place at once in importance beside Grant's 'History of physical astronomy,' which it in a measure supplements. No clearer indication

*A popular history of astronomy during the nineteenth century.* By AGNES M. CLERKE. Edinburgh, Black, 1885. 8°.

*Psychology.* By ANTONIO ROSMINI SERBATI. Vol. ii. London, Kegan Paul, Trench & Co., 1885. 8°.

of the wonderful advance of the 'new astronomy' during the third of a century since Professor Grant wrote, and of the need of a historian for it, can be furnished than the fact that what was then called physical astronomy is now termed theoretical, mathematical, or gravitational; while to-day by physical astronomy is generally understood the investigation of the intimate relations between astronomy, physics, and chemistry as studied in the sun, stars, comets, planets, our own atmosphere, and laboratories.

Miss Clerke has been peculiarly happy in the rôle of historian. Terse and highly original in style, her work will hold the attention of every educated reader for its literary merit alone, while the copious footnote references to the original sources of information make it a mine of wealth to the student and astronomer. The work is so excellent, and also so rapid is the progress of astronomical discovery, that new editions will rapidly follow; and for the purpose of making them as valuable and accurate as possible, we trust we shall not be considered hypercritical in calling attention to a few points, either where further comment or criticism would seem desirable, or where we think an error of judgment or interpretation, or some slight slip of reference or quotation, has been made. Anything but a first-class work we should not consider thus worthy of attention.

On page viii., for 'Illinois' read 'Madison, Wisconsin.'

In the closing description of the total disappearance of Biela's comet, on pp. 127 and 128, it would seem desirable, for the benefit of the reader ignorant of the facts, to refer him to the description further on, pp. 377-380, of subsequent encounters with it in the form of meteor showers, the latter now to be supplemented by the shower of last November, since the book was written.

To the non-astronomical reader, and even to the amateur spectroscopist who only knows of the spectrum as given by an image of the sun covering the whole slit or by some form of integrating spectroscope, the reference on p. 254 to Lockyer's long and short lines will be unintelligible without such a description of his apparatus as will explain that his long or short lines indicated the existence of incandescent shells of vapor at greater or less distances round his electric spark terminals, whose image was thrown on the slit by a lens.

In the enumeration of phenomena observed during different transits of Mercury, pp. 290 and 291, reference should be made to the one most extensively observed of all, that of 1878, May 5 and 6, as described and discussed in the *Washington observations* for 1876, part ii., app. ii.

Probably the paragraphs on pp. 304 and 305 regarding Mr. Croll's theories of secular changes in climate would be somewhat modified since the rather merciless criticism these theories have received at the hands of Woeikof, from the standpoint of a scientific meteorologist. (See *Amer. journ. of science* for March, 1886.) We can hardly see a justification for the opinion, p. 315, that Professor Langley's researches lend countenance to the idea that the temperature of the full moon's surface is anything like 500° F. It is difficult to keep up with Professor Langley nowadays, but, so far as we understand his results, they almost certainly point to a temperature below 100° F., and very probably below the freezing point of water.

Upon reading the letters of Bakhuyzen and Proctor in *Nature*, xxxiii. pp. 153 and 245, the author will see that the period or rotation of Mars deduced by the former must be incomparably more accurate than Proctor's, and in a new edition Bakhuyzen's later value should be given.

In spite of the apparent partial confirmation from several sources, we still remain somewhat skeptical regarding Schiaparelli's canals upon Mars (pp. 324 and 325), especially the duplicate parallel ones. We shall look with interest for the attack upon Mars with the Lick 36-inch refractor when set up on Mt. Hamilton.

On p. 329, line 3, for 'Vesta' read 'Pallas.'

As to the idea that the distribution of the asteroids has been largely influenced by commensurability of period with that of Jupiter (p. 329), or that gaps in the rings of Saturn have anything to do with the distances of its satellites, we regard the theory as entirely unproven as yet, and would refer to an article on the subject by Professor Hall in the *Sidereal messenger* for September, 1885, also copied in the October number of the *Observatory*.

We question the advisability of referring to a meteor shower as 'star-drift' (p. 371, line 5), when this term has already crystallized into the definite meaning of community of proper motion among neighboring stars or systems of stars (p. 438).

The subject of photometry is not adequately treated in the volume. This really deserves a whole chapter, but does not even occur in the index, while the paragraph on p. 435 does no justice whatever to the subject. Several of Professor Pickering's results are incidentally referred to in various parts of the book, but some description of his wonderfully ingenious photometers and methods which have revolutionized the whole subject and given rise to so much discussion is certainly to be expected in a book of this high character. One of the most important of his works, the series of photometric observations of the eclipses of Jupiter's

satellites, which has now been going on for eight years at the Harvard college observatory, is not mentioned at all. We should like to say a few words here upon the importance of this particular series of observations, which has as yet not received due justice in print, but space forbids. By the way, the phenomenon of the eclipses of these satellites and their important relation to the velocity of light and the dimensions of the solar system is not referred to at all.

We regret that the pages concerning the relative value of large versus small telescopes (443 and 445) appear in so good a book, and we do not think they would have been so written had the author been a practiced observer. We have not space here to join in this wide discussion, but we would commend the author and our readers to the able summary of the case in the letter of Professor Young (*Observatory*, February, 1886,) as embodying the true gist of the whole matter. Incidentally, the curious misunderstanding of Professor Hall's letter (*Observatory*, May, 1885,) is worth noticing. How any one who has ever used a telescope can read this letter without seeing quiet sarcasm in every line, we fail to see. But our transatlantic neighbors in a body seem to have taken it as written in sober earnest, and the sermons preached from it have been highly amusing, even going so far as to suggest a possible permanent set or distortion in the lenses of the Washington 26-inch since its first manufacture. We advise Professor Hall to preface any future communications of this sort with 'The following is sarcastic,' or other equivalent explanation.

In the various discussions of reflectors *versus* refractors, we have looked in vain for a clear statement of the different effect, upon definition, of flexure of the mirror or objective. If gravity bends a lens so that one side is more convex, the other becomes more concave, and the effect upon definition is a quantity of another order entirely from that due to flexure of either side alone; while the bending of the surface of a mirror appears with its full effect upon the definition; so that a mirror which forms any part of a telescope and changes its position with reference to gravity must be almost infinitely more rigid than a lens in the same situation in order to perform equally well. This should be borne in mind in such discussions (p. 450).

Miss Clerke has not touched upon the subject of Mr. Denning's so-called 'fixed radiants' of meteor streams and the startling suggestions as to the peopling of interstellar space to which the claim has given rise. In the present uncertainty about the reality of the phenomena, perhaps it is just as well. With to-day's doubtful methods of map-

ping the tracks of meteors, our opinion is that we must wait till some Argus-eyed camera, whose overlapping lenses and plates (mounted on a hemispherical surface driven by equatorial clock-work) are sensitive enough to record the paths of all the fairly bright meteors, shall decide, by the doctrine of probabilities, as to the real existence of nine-tenths of the so-called 'radiants' of to-day.

Did space permit, pages might be written in praise of the excellent features of the book. But, where so much is good, we consider our limited space better employed in pointing out a part of the minor faults, in order that subsequent editions may be as perfect as possible. Hence, in so much as we may have seemed hypercritical, by so much we trust that the author will consider it a compliment to the general excellence and importance of her work.

H. M. PAUL.

Washington, July 24.

It is not a little curious, says the *Lancet*, that the diseases arising from the wrong use of tea should be met with in greater frequency in countries foreign to its growth. The diseases due to this cause are well known to doctors, but the public seem to be strangely indifferent to the teachings of their medical advisers in these matters. Recently in France M. Eloy has reminded medical men how vast is the number of diseases owing an allegiance to the dominion of Queen Tea. America and England are the two countries that are afflicted most with the maladies arising from its excessive consumption. Individuals may suffer in a variety of ways. It is customary to speak of acute, subacute, and chronic 'theism,'—a form that has no connection with theological matters. The predominance of nervous symptoms is a characteristic of theism. General excitation of the functions of the nervous system may be observed, or the weakness may be noted more especially in the brain as distinguished from the spinal cord. Perversion of the sense of hearing is not at all an uncommon symptom, patients hearing voices that have no real or objective existence. The irritability that overtakes women so frequently may sometimes be clearly traced to an excessive indulgence in afternoon tea. No doubt the tannin which tea that has been standing contains does a great amount of mischief; but theism belongs, rather, to that class of diseases in which morphinism, caffeism, and vanillism are found. The habit of tea-drinking is one that grows on its victims like the similar ones of opium or alcohol. Taken in strict moderation, and with due precautions in the mode of preparation, tea is, like alcohol, a valuable stimulant; in its abuse there is also certain analogy.