

try where I met with so much kindness and such uniform courtesy.

C. LLOYD MORGAN.

UNIVERSITY COLLEGE, BRISTOL, ENGLAND.

THE SUBJECT OF CONSCIOUSNESS.

EDITOR SCIENCE: Referring to the review of my 'Lehrbuch der Allgemeinen Psychologie' in your valuable magazine for September, 1895, which has but recently come to my notice, I sincerely regret that the reviewer should have fallen into so manifest an error as to suppose the 'subject of consciousness' of my 'Psychologie' to be equivalent to 'self-consciousness;' though he expresses himself with some hesitancy when he says 'it seems most nearly,' etc. As I have pointed out in my work, the misunderstanding is quite apt to arise, from the fact that the word 'subject' is often used in the sense of the 'Ego' or 'Self,' as even shown by the reviewer when he says, 'the consciousness of self or subject.' But that is just the very sense in which I do *not* use the word 'subject.' With me, the 'subject of consciousness' does not designate the 'Ego' or the 'conscious mental individual,' but only its fundamental unifying general abstract element, which always exists in the closest union with the other element, which I call *attribute* of consciousness, and *with which* it constitutes the individual unit 'consciousness' or 'conscious individual.' When this is distinctly understood it will be impossible to mistake the 'subject of consciousness,' *i. e.*, the psychological foundation of *all* mentality, for 'self-consciousness,' which is but a later development of the *individual* mind, the 'mental *individual*.' It is a source of great satisfaction to me to have been the first to call attention to this fundamental unifying element. I call it 'subject,' though I shall gladly give up the name if any one will suggest another that is not so liable to be misunderstood. In my 'Psychologie' I lay particular stress upon the fact that, if this 'subject' were not originally present in mental life as the unifying element, together with the attributes of consciousness (sensations, feelings, etc.); if, therefore, as the associationists think, mental life were possible without a subject of consciousness, it would be impossible to explain 'self-consciousness,' which makes its

appearance later; for it is precisely this self-consciousness, which is based primarily upon the existence of the 'subject' as an element of consciousness; but *for that very reason* it is far from being identical with that 'subject.'

JOHANNES REHMKE.

GREIFSWALD, April 16, 1896.

THE PREROGATIVES OF A STATE GEOLOGIST.

EDITOR SCIENCE: In connection with the communication of Dr. Keyes, published in SCIENCE, April 24th, page 365, permit me to say to any who may have a passing interest in the subject that I sent the impression paper copy of the original manuscript to the Editor of SCIENCE with a copy of the publication as it appeared, with a request that he kept the two for some months in order that any one wishing to look into the matter might have an opportunity to do so and judge for himself whether I wrongfully represented matters in my communication published in SCIENCE of April 3d last. I might also state that I sent Dr. Keyes a copy of the letter nearly three months before it was published, with a statement that I would publish the same if he did not do something to give me credit for that which was mine, but which had been published under his name.

ERASMUS HAWORTH.

A CORRECTION.

It is unfortunate that although the figure from Dr. Mügge's paper which I reproduced in SCIENCE last week (p. 698) was expressly marked 'top' on one side, it has been inserted upside down by the compositor. In its present position the figure is meaningless and even misleading.

T. A. JAGGAR, JR.

THE ABSOLUTE AND THE RELATIVE.

TO THE EDITOR OF SCIENCE: Your correspondent 'M.,' in the number of SCIENCE for April 24th, raises a new issue with me; one which has only an indirect bearing upon the subject matter of my article on the 'Illusion Concerning Rest.' In that article I attempted to demonstrate that motion cannot be created or destroyed by collision, but that the body in motion can be only deflected thereby. Now my friend abandons that demonstration and

raises another question about the nature of the absolute and the relative in motion, and shows that he entertains an illusion concerning relation. Of this illusion I shall treat hereafter in another article.

If there was but one particle in the world having motion it would change place. Such a particle does not exist alone, for there is a multitude of particles; but one particle can be considered as existing alone. The particle then would change its place because it had motion, and one place can be compared with another; but as in fact there are a multitude of particles there is also position which is a relation among particles and we may therefore define motion as change of position, and as other particles have motion it is a mutual change of position. By comparing the one particle with the many the demonstration of its motion is perfected. By comparing the motion of a molar body with the motion of its particles and also with the motion of the earth it is seen that molar motion may cease, but that this cessation does not end its molecular nor its stellar motions. That a molar body may come to rest only one of its modes of motion must be destroyed, therefore, rest is not the end of all the motion of any molar body but only the stoppage of molar motion. I have pointed out that the creation of molar motion is the deflection of the other motions inhering in the body and also that the destruction of molar motion is also the deflection of other motions in the body, and no scientific man will deny these propositions; but scientific men have believed that the creation and destruction of molar motion involves not only deflection, but also under some circumstances, though not under all, creates and destroys motion as speed. This I deny and challenge any scientific man to demonstrate any creation or destruction of motion; and, more than that, I claim that Newton's law of motion and the doctrine of the persistence of energy both teach that motion cannot be created or destroyed.

To define motion as change of position instead of change of place is advantageous, for scientific men desire to measure motion both as speed and as path; but to measure a quantity and express it, it must be measured in terms of an-

other and expressed in terms of another. Thus it is that science uses the best definitions for its purposes. I would not write for a scientific journal if I did not believe that I was making a contribution to science. In the case of this series of articles I confidently believe that I shall make a contribution to psychology. I desire to explain the nature of certitudes and illusions by explaining specific certitudes and illusions, and finally I wish to explain the law of mental evolution which is the eliminating of incongruous notions and the criterion for distinguishing certitudes from illusions. Now, my friend need not fear that the bottom will drop out of any real science.

The illusion concerning relation is a fundamental notion in idealism. Those who have fully thought out idealism in all its consequences, as Kant seems to have done and Fichte and Hegel surely did, first attempt to resolve all material phenomena into relations, then affirm that the only absolute is found in mind and that all actuality is mind and that the material universe exists only in thought. I shall attempt to show the certitudes and illusions contained in this philosophy, and for this purpose it becomes necessary for me to define, illustrate and demonstrate the absolute, then to define, illustrate and demonstrate the relative, and finally to point out the illusions concerning the absolute and the relative which have existed and which are especially characteristic of metaphysic, but which sometimes exist in science.

That which exists in one and is essential to its existence is absolute, but as there is more than one, that absolute necessarily becomes relative because there is more than one. In the world there is no such thing as a pure absolute and there is no such thing as a pure relative. If there is no absolute there is no world; if there is no relative there is no world. This is one of the fundamental propositions which I am seeking to demonstrate, and for that purpose I am seeking to point out both elements, that the phantasy of metaphysic may be dispelled, and science may not be burdened with illusions. In my article on rest I tried to point out one of these illusions which inheres in all metaphysical reasoning and which lingers.

in scientific reasoning in spite of the Newtonian definition of motion and the definitions given to momentum, energy, force and power. Curiously, I find that even some physicists have not mastered these definitions and still entertain the historical illusion concerning the nature of rest. If my demonstration is studied it will be accepted only in case it does not conflict with some other notion, as that about the nature of relation.

Finally, let me present three other propositions: First, to produce rest in one body it is necessary to transmute one mode of motion into another; second, to produce a new mode of motion it is necessary to transmute a part or the whole of some other mode of motion. Both of these definitions are included in the axiom which I have previously given, that motion cannot be created or destroyed. Third, if motion is not both absolute and relative it does not exist.

J. W. POWELL.

SCIENTIFIC LITERATURE.

Life, Letters and Works of Louis Agassiz. By JULES MARCOU. With Illustrations. Two volumes. New York, Macmillan & Co. 1896. Pp. 302, 318.

Mrs. Agassiz's life of her illustrious husband has always been considered a model of what such a biography should be, full and minute where the matters were important, brief where they were trivial, and composed by elimination rather than agglomeration, so that the effect is massive and interesting from first to last. Mr. Marcou seems to have aimed at muchness of matter rather than excellence of form, and the result is a very different sort of book, realistic and abounding in *traits vifs*, but pervaded by a curious commonness of tone, and by a lack of style rather odd in a Frenchman. In his eagerness to supply every detail of date, place, persons present etc., where events are recounted, too many pages are filled with mere statistical enumeration.

Too much is said of individuals who play subordinate parts in the narrative, and who ought either to have been subordinated still more or made more interesting by becoming more prominent. Any attempt on the part of an outsider to give an in-door view, a view *en*

robe de chambre, so to speak, of a man whose family is still living, savors of a certain bad taste, and the strained air of familiarity on Mr. Marcou's part ends by displeasing the reader the more, as it frequently appears to be an appearance of knowingness rather than a real knowledge, where minor events and personages are considered.

It offends most in the author's handling of certain persons who, having once been co-workers with Agassiz, had in one way or another ceased to be his friends. Human nature, even when in the wrong, demands something more than this off-hand contemptuous treatment, or else something less in the way of space taken up. The book, moreover, is written most disjointedly, is full of repetitions, and its comments on Agassiz's zoological philosophy are sadly beneath the level of the subject. But in spite of these defects—and they are truly grave ones—Mr. Marcou has evidently taken great pains with his volumes, and has achieved a result which probably comes quite near that at which he aims. In spite of his non-idealizing temperament, he genuinely admires his hero; and what with his facts, his broader appreciations, and all his little dabs and touches, the reader gets at last a picture of Agassiz which is both vivid and realistic, and awakens sympathetic admiration far more than any other kind of comment. Agassiz's personality was indeed so immense, his passions so overpowering, his enthusiasms so magnificent, his sociability and friendliness so great, that no other result was possible. His life, in all its phases, becomes inevitably a sort of heroic romance. Never was there so glorious a youth. At 20 he was a great collecting naturalist. At 22, whilst a student at Munich, he had published his folio describing Spix's collection of Brazilian fishes. At 23 he had begun work on his *Histoire Naturelle des Poissons*. At 26 his *Recherches sur les Poissons fossiles* began to appear. At 30 he had proved the 'Glacial Epoch' and received the Wollaston medal from the Geological Society—a unique honor for so young a man. Mr. Marcou catalogues 43 publications from his pen, many of them of the first order of magnitude, before his 31st year. And all this with no basis of support but his