

the old units. These things being so, to "challenge" the metric system is like challenging the rising tide. Nothing more futile can well be proposed, unless it be a change in the length of the inch. Nevertheless, there is a goodly company of writers to keep the Hon. Capt. Noel in countenance in conjoining these two sapient projects. None of these gentlemen supports the constructive parts of the other's propositions; but they are unanimous against the metric system and the existing inch.

Mr. Noel's system is nearly as complicated and hard to learn as our present one, with which it would be fearfully confused, owing to its retaining the old names of measures while altering their ratios. Thus we should have to learn that $2\frac{1}{2}$ feet would make a yard, 4 miles a league, 5 feet a fathom, 625 acres a square mile, 1,953,125 cubic ells a cubic yard, 216 cubic inches a gallon, 24 ounces a pound; etc. But it is not intended that this complication shall last for ever, for this lesson, once digested, is to be followed by a clean sweeping away of the decimal numeration and the substitution of duo-decimals. Mr. Noel enumerates sixty-eight advantages of his proposal, among them the following: "Mile, one-quarter hour's walk, better than kilometre"; "cubic foot worthier base than cubic decimetre"; "old London mile restored." The scheme is not without merit, and might have been useful to Edward I. Even at this day it must at least have afforded some agreeable occupation to its ingenious and noble author, not to speak of the arithmetical practice.

50 (27 March 1890) 265

Epitome of the Synthetic Philosophy.

By F. Howard Collins. With a preface by Herbert Spencer. D. Appleton & Co. 1889.

CSP, identification: MS 1365. See also: Burks, *Bibliography*. This note is unassigned in Haskell's *Index to The Nation*, vol. 1.

A more admirably executed second-hand synopsis of a system of philosophy never was. Considered simply as an index to Spencer's systematic works, this 'Epitome' is invaluable; and to persons who read and reread those thick volumes, not because they believe in them, but only because they want to know what it is that so many others believe, and to whom the writings of the dreariest scholastic doctor are less heartbreakingly tedious, this one volume of 500 pages in place of a library of 5,000 pages is like balm of Gilead. Would it only embraced an introduction boiling the whole thing down to 50 pages! It is printed uniformly with Spencer's works, upon agreeable paper with clear type, and published by the same eminent firm which, by the dissemination of those writings, has contributed so much to the culture and thought of our people.

50 (19 June 1890) 492-493

RIBOT'S PSYCHOLOGY OF ATTENTION

The Psychology of Attention.

By Th. Ribot. Authorized translation. Chicago: The Open Court Publishing Company. 1890. 8vo, pp. 121.

CSP, identification: MS 1365; Haskell, *Index to The Nation*. See also: Burks, *Bibliography*; *List of Articles*.

Every educated man wants to know something of the new psychology. Those who have still to make acquaintance with it may well begin with Ribot's little book on 'Attention,' which all who have made progress in the new science will certainly wish to read. It is the *chef d'œuvre* of one of the best of those students who have at length erected psychology into a science.

Ribot regards the doctrine of attention as "the counterpart, the necessary complement, of the theory of association." He means that attention is related to suggestion as inhibition to muscular contraction. Physiologists, however, would scarcely rank *inhibibility* with contractility as an elementary property of protoplasm. Besides, though suggestion by association may be likened to muscular action, how can the analogy be extended to the process of association itself, or the welding together of feelings? This welding seems to be the only law of mental action; and upon it suggestion and inhibition of suggestion alike depend. Attention is said by Ribot to modify reverie's train of thought by inhibiting certain suggestions, and thereby diverting their energy to suggestions not inhibited. This makes the positive element of attention quite secondary. At the same time, we are told that the sole incitement to attention is interest. That is to say, a preconceived desire prepares us to seize promptly any occasion for satisfying it. A child's cry, drowned in clatter of talk for others' ears, attracts the mother's attention because she is in some state of preparation for it. Ribot, however, does not remark that to say the mind acts in a prepared way is simply to say it acts from a formed association, such action not being inhibitory. If interest be the sole incitement to attention, it is that the energy spent upon the interesting suggestion leaves none for others, rather than that a positive inhibition of the latter throws waste energy into the former. This only happens when attention is controlled for a conscious purpose. If, in the beginning of his inquiry, Ribot had discarded the unscientific word "attention," and with it his feeble antithesis of association and attention, the truth would have shone out that the main phenomenon is emotional association, aided in certain cases by acts of inhibition.

The most interesting and valuable parts of the book are those devoted to corporeal concomitants of attention. Evidence is that in this act parts of the brain receive increase of blood. This must be due to stimulation of the vaso-motor nerves, belonging to the sympathetic system, under the influence of the desire in the interest of which attention is excited. Moreover, in intense attention the breath is held, and in every case respiration is slackened. There are, besides, certain muscular actions: in external attention, the eyebrows and the skin of the forehead over them are drawn up, the eyes opened wide and directed to the

object, the jaw more or less dropped, and the whole body held immobile in an attitude as if approaching the object. In internal attention, the brow is contracted, the eyebrow lowered, the lid at least partially closed, the jaw clenched, the lips pursed up, the body usually immobile, preferentially in a sitting posture with the whole arms close to the trunk. There are, however, often motions, as walking up and down. These muscular states are indispensable conditions of attention. "It is impossible to reflect while running at full speed or climbing a steep ascent." "A child, seven years old," not able to breathe through its nose, owing to a tumor, "had succeeded in learning, during a whole year, only the first three letters of the alphabet. Having been operated upon for its adenoid tumor, the same child in a single week learned the entire alphabet."

According to Ribot, these muscular actions are not *aids* to attention, but constitute attention. The notion that we think with our muscles is very attractive to the whole new school. Ask why, and you are told, because "every act of volition, whether impulsive or prohibitory, acts only upon muscles and through muscles; any other conception is vague, incomprehensible, and chimerical." This little burst of emphasis signifies defective evidence. When positive evidence is at hand, it is calmly put in; when prejudices have to be addressed, warmth is in order. The truth is, all these physiological psychologists are "monists." For theory of connection of soul and body, they have struck a happy compromise between materialism and spiritualism, in holding that mind and matter are simply two aspects of the same thing. If the balance were really preserved between the opposing tendencies, the result would be a doctrine in harmony with philosophic pessimism, but not easily reconciled with observed facts. But is the balance held even by the psychophysicists? They say, for example, that unorganized matter feels, if at all, very little. But when we expect them to balance this by cases in which mind is barely, if at all, connected with matter, they insist, on the contrary, that the attributes of matter do not admit of augmentation and remission, and that soul only exists as an aspect of that which otherwise appears as corporeal. What is this but making mind to be a special determination of that universal substance which is generally known to us as matter? And to make mind a specialization of matter would seem, metaphysical phrases apart, to be materialism. In our day, the charge of being materialist will scare nobody; and all the facts of life show dependence of soul upon body. Yet common sense will never admit that feeling can result from any mechanical contrivance; and sound logic refuses to accept the makeshift hypothesis that consciousness is an "ultimate" property of matter in general or of any chemical substance.

No philosophy will endure which does not freely allow to every reason, every fact, its full force. But this school is for ever exaggerating the resemblances of psychical and physical phenomena, for ever extenuating their differences. Ribot, for example, often speaks of the "mechanism of association," and even attempts to apply to it the physical distinction of potential and kinetic energy. But looking at the matter without prepossession, or with that of a student of mechanics, the analogy between the process of association and any mechanical motion does not appear to be very close. Both are operations governed by law, it

is true. But the law of mechanics is absolute, prescribing (after two positions are given) the precise point of space where each particle shall be at each instant of time; while the force of association is essentially a gentle one (two ideas that have occurred together having a gentle tendency to suggest one another), and if it were made absolute, ideas would at once be rigidly bound together, and the whole phenomena of learning, or generalization, which is the essence of association, would be put to death.

Again, alike in the physical and the psychical world, we find trains of causation. In the latter, it is the past alone which directly and involuntarily influences the present by association; the future we only divine; and all our efforts are to make our present actions conform to our idea of that future. In the physical world, on the contrary, regard being had to the law of the conservation of energy, which denies any primordial force dependent on velocity, the past and the future are in relations to the present precisely similar to one another—a fact which appears from the circumstance that, in the equations of motion, the sign of the flow of time may be reversed, provided the signs of the velocities are reversed, the forces being unchanged, and still the formulæ will remain intact. We will not say that these distinctions between mental and mechanical actions are facts large enough to blot out their slight resemblances, for these latter should neither be overlooked nor disregarded; but the distinctions will certainly be prominent in a well-proportioned view of the subjects. Undoubtedly, there are physical phenomena in which gentle forces seem to act, and others which seem to violate the principle of energy; but these appearances are due to a principle different from a law of motion, namely, to the action of probability. The type of such phenomena is the viscosity of a gas; and the regularity of this, closely approximate but not strictly exact, is due to the countless trillions of molecules which are flying about in all directions with almost every rate of speed. That there is analogy between spreading of motion through a gas by viscosity and association of ideas need not be denied.

In regard to the doctrine that volition consists in, or is an aspect of, muscular contraction or inhibition, it is to be considered that considerable time elapses during the passage of the motor impulse down the nerve. During this interval we seem to be aware of a striving, like that of nightmare. At any rate, something has taken place in which the muscle had no part. The muscle might even be amputated before the impulse reached it. But if a motor impulse can thus be communicated to a nerve fibre to be transmitted over it, how can we be sure that this latter may not abut against a nerve cell instead of against a muscle cell?

Ribot's terminology sometimes seems open to criticism. Of the two forms of attention, that which is governed by the course of outward perceptions and that which is controlled from within by definite purposes, he terms the former *spontaneous*, the latter *voluntary*. Now, suppose a man in a sudden fit of anger blackguards another, can it be said that his speech was *involuntary* simply because it was not controlled? And if he wished to excuse himself on the ground of sudden provocation, would he say that his language was purely *spontaneous*? It would seem better to call every action which is subject to inward control *volun-*

tary, whether actually controlled or not, and to apply the term *spontaneous* only to those acts which are *not* reflexes from external stimuli.

The translation is sufficiently good, and the *Open Court* is doing useful work in publishing such books.

51 (3 July 1890) 16

Pure Logic, and Other Minor Works.

By W. Stanley Jevons. Edited by Robert Adamson and Harriet A. Jevons. Macmillan & Co. 1890.

CSP. identification: MS 1365. See also: Burks. *Bibliography*. This review is unassigned in Haskell's *Index to The Nation*, vol. 1.

Though called Minor, these are scientifically Jevons's most important writings. As when they first appeared, they impress us by their clearness of thought, but not with any great power. The first piece, "Pure Logic," followed by four years De Morgan's "Syllabus of Logic," a dynamically luminous and perfect presentation of an idea. In comparison with that, Jevons's work seemed, and still seems, feeble enough. Its leading idea amounts to saying that existence can be asserted indirectly by denying the existence of something else. But among errors thick as autumn leaves in Vallambrosa, the tract contains a valuable suggestion, a certain modification of Boole's use of the symbol $+$ in logic. This idea, directly suggested by De Morgan's work, soon presented itself independently to half-a-dozen writers. But Jevons was first in the field, and the idea has come to stay. Mr. Venn is alone in his dissent.

The substance of the second piece in this volume, the "Substitution of Similars," is in its title. Cicero had a wart on his nose; so Burke would be expected to have something like it. This is Mill's inference from particulars to particulars. As a matter of psychology, it is true the one statement suggests the other, but logical connection between them is wholly wanting. The substitution of similars might well be taken as the grand formula of bad reasoning.

Both these tracts warmly advocate the quantification of the predicate—that it is preferable in formal logic to take $A = B$ as the fundamental form of proposition rather than "If A, then B," or "A belongs among the Bs." The question is not so important as Jevons thought it to be; but we give his three arguments with refutations. First, he says the copula of identity is logically simpler than the copula of inclusion. Not so, for the statement that "man = rational animal" is equivalent to a compound of two propositions with the copula of inclusion, namely, "If anything is a man, it is a rational animal," and "If anything is a rational animal, it is a man." True, Jevons replies that these propositions can be written with a copula of identity, $A AB$. But A and B are not symmetrically situated here. They are not simply joined by a sign of equality. Second, Jevons says that logic takes a more unitary development with the proposition of identity than with that of inclusion. He thinks his doctrines of not quantified logic and the substitution of similars call for this copula, but this is quite an error. And then an inference supposes that if the premises are true, the conclusion is true. The

relation of premises to conclusion is thus just that of the terms of the proposition of inclusion. Thus the illative "ergo" is really, a copula of inclusion. Why have any other? Third, Jevons holds the proposition of identity to be the more natural. But, psychologically, propositions spring from association. The subject suggests the predicate. Now the difficulty of saying the words of any familiar thing backwards shows that the suggesting and suggested cannot immediately change places.

The third piece in the volume describes Jevons's logical machine, in every respect inferior to that of Prof. Allan Marquand, and adequate only to inferences of childish simplicity. The higher kinds of reasoning concerning relative terms cannot (as far as we can yet see) be performed mechanically.

The fourth paper advocates the treatment of logic by means of arithmetic—without previous logical analysis of the conception of number, which would call for the logic of relatives. To exhibit the power of his method, Jevons shows that it draws at once such a difficult conclusion as this: "For every man in the house, there is a person who is aged; some of the men are not aged. It follows, that some of the persons in the house are not men." Unfortunately, this is an exhibition not of the power of the method, but of its imbecility, since the reasoning is not good. For if we substitute for "person," even number, for "man," whole number; for "aged," double of an integer, we get this wonderful reasoning: "Every whole number has its double; some whole numbers are not doubles of integers. Hence, some even numbers are not whole numbers."

The remainder of the book is taken up with Jevons's articles against Mill, which were interrupted by his death. The first relates to Mill's theory of mathematical reasoning, which in its main features is correct. The only defect which Jevons brings out is, that no satisfactory mode of proving the approximate truth of the geometrical axioms is indicated. But this is a question of physical, not of mathematical, reasoning. The second criticism, relating to resemblance, seems due to Jevons's not seizing the distinction between a definite attribute, which is a resemblance between its subjects, and Resemblance in general, as a relation between attributes. The third paper concerns Mill's theory of induction. That theory may be stated as follows: When we remark that a good many things of a certain kind have a certain character, and that no such things are found to want it, we find ourselves disposed to believe that all the things of that kind have that character. Though we are unable, at first, to defend this inference, we are none the less under the dominion of the tendency so to infer. Later, we come to the conclusion that certain orders of qualities (such as location) are very variable even in things which otherwise are closely similar, others (as color) are generally common to narrow classes, others again (as growth) to very wide classes. There are, in short, many uniformities in nature; and we come to believe that there is a general and strict uniformity. By making use of these considerations according to four certain methods, we are able to distinguish some inductions as greatly preferable to others. Now, if it be really true that there is a strict uniformity in nature, the fact that inductive inference leads to the truth receives a complete explanation. We believe in our inferences, because we are irresistibly led to do so; and this theory shows why they come out true so often. Such is Mill's doctrine. It misses the essential and dwells on secondary features of scientific inference; but it is an