

THURSDAY, MARCH 20, 1879

ROYAL AGRICULTURAL COLLEGE,
CIRENCESTER

DURING the last few years the question of Agricultural Education has been very fully and fruitfully discussed. The experiment of an examination in the principles of agriculture, under the Science and Art Department, had an unexpected success; and showed that there was throughout the kingdom a demand for instruction in agricultural matters. At the present moment efforts are being made to satisfy this demand more completely by means of local organisation for developing and extending the facilities already offered by the Science and Art Department.

There is at Cirencester a college founded specially for the advancement of agricultural education. It has one—or more—Royal Charters; it has the power of granting diplomas; it is under Royal patronage, and has the advantage of being managed by numerous Earls and M.P.s. This institution ought to (and might) have been the centre of the movement to which allusion has been made; but, unfortunately, its own troubles seem to be enough to occupy the whole attention of the Committee of Management; and, for the second time in the history of the college, threaten to bring about its extinction. For the past few weeks the agricultural press has been teeming with letters and articles headed "Professor Church and the Royal Agricultural College." The facts, as to which there seems to be no dispute, are briefly these:—Prof. Church is about to be married. Other professors, his colleagues and juniors, had done the same, and non-residence in their cases was not found incompatible with the proper performance of their several duties; as a matter of fact each of Prof. Church's predecessors was non-resident. Yet the Principal intimated to Prof. Church that without residence he could "no longer discharge the duties of Professor of Chemistry in this college." It appeared that this decision on the part of the Principal was not authorised under the bye-laws: such a point could be determined only by the Committee of Management; and the case was referred to them. The result was, however, unaltered. While "fully sensible of the services rendered by Prof. Church during his sixteen years' residence in the College," the Committee "regret that they cannot accede to his recent proposal of non-residence." The consequence of this was two resignations. Prof. Lloyd Tanner regarding the decision "as showing that neither long and zealous performance of duty, nor special ability for work are duly recognised," has resigned the Chair of Mathematics and Physics; and Prof. Fream, "as the only protest it is in his power to make against the treatment his colleague has received," similarly vacates the Chair of Natural History.

Such are the circumstances under which the three senior resident professors at Cirencester College are leaving. Other matters have rendered the affair even more painful than it need have been, but we believe the simple, undisputed facts of the case are amply sufficient to enable our readers to form a just opinion of the mode of managing Cirencester College. Those who intend to become candidates for the vacant chair have had an

opportunity of judging how one bye-law can be and is used against a man such as Prof. Church; we will only advise them to study the other bye-laws and guess how they may be used against younger and less known men. Having seen these bye-laws ourselves we are curious to know who will be induced to replace the vacancies just announced.

PROF. HUXLEY'S HUME

Hume. By Prof. Huxley. (London: Macmillan and Co., 1879.)

PROF. HUXLEY has given a clear and succinct account of the philosophy of Hume, in a style at once fresh and pointed. We should be thankful to him that, following the example of Locke and Hume himself, he discusses philosophical questions in genuine and idiomatic English, and consistently avoids the use of a lumbering phraseology, imported from abroad, amid which the thinking evaporates, for the most part, in pure verbalism. The volume before us is limited to a brief account of Hume's life and his philosophical opinions. It hardly touches what has been said on the other side in criticism or in correction of Hume's views. Here and there Prof. Huxley offers a criticism; but, though generally acute, it is seldom on anything but a point of detail. Indeed, the volume may be described as rather too much of a bare statement of Hume's principles and conclusions.

As Prof. Huxley may fairly be regarded as dogmatically accepting Hume's principles and boldly carrying them out to their results, while Hume may with probability be regarded as having only hypothetically held the principles, we might have expected a fuller vindication of them than is at all attempted in the volume. On all the metaphysical questions of greatest moment Prof. Huxley's position is a negative one; and if, as it seems, he accepts Hume's principles absolutely, it is one of complete negation.

In the opening chapter on the Philosophy (Chap. II.) Prof. Huxley has done good service in clearly stating the terms of the question. He very properly points out that the question regarding the limits of knowledge, or "What we can know," is not a primary but a secondary question. He is emphatic in showing that it implies the previous questions as to what we mean by knowledge, and how we come by the thing we call knowledge. And he very well points out that these latter questions are psychological, and that psychology, accordingly, is the only proper basis of assertions about knowledge, whether these refer to its nature, conditions, or limits. This clear and vigorous statement is not inopportune, for there is somewhat of a tendency at present, very inconsistently indeed, to ignore psychology. We have professions of "deducing" the conditions of "experience." It seems strange that it does not occur to the advocates of such a method that its basis is necessarily an accurate examination of what experience or consciousness in its fullest extent is; what, in a word, is the thing spoken of, whose conditions it is proposed to evolve. This implies a full and scientific psychology—the only safeguard against fantastic system-making, otherwise the so-called "deduction" becomes a method of *if and must*

—hypothesis and hypothetical inference; having no bearing on our experience.

What Hume really sought in philosophy was the ultimate element, out of which all valid knowledge might be shown to flow. This element was to be at once the source and the test of every conception of the human consciousness. This he supposed he found in the "simple impression" or "simple impression of sensation." The essence of Hume's method is to reduce all so-called knowledge of objects to this test; his constant demand is—show me the "impression" from which your alleged conception or idea is derived, and then, but then only, shall I admit the reality and validity of your knowledge. If our conception be meaningless, the object of it is unreal. It is easy to see how on such a method, whether adopted hypothetically or dogmatically, self-existence, self-identity, personality, and Deity must be given up.

But the question at once arises:—*What precisely is this so-called "impression of sensation," or "singular sensation?"* The psychological method has been admitted. And we must apply this method to find whether there is such a thing as an *impression per se*. It is at least a consciousness, or state of consciousness. If it be said that *impression* is not the full fact, but a mere abstract part of the complex fact which we call consciousness—this is a position which is quite as vindicable on Hume's psychological method as his statement of the fact is. We do not require to have recourse here to any "transcendental deduction," or to Prof. Huxley's "pure metaphysician." We only ask whether the psychological method is fairly applied to the fact. Here we do not think that Prof. Huxley has done any justice to those who say and seek to show that *impression per se* is a mere abstraction—possibly even a simple unintelligibility.

No doubt Prof. Huxley tells us that Hume omitted an entirely irresolvable element of consciousness, viz., relation, as of succession, co-existence, &c. But one does not see that Prof. Huxley apprehends the true force of his own admission. The *relation* of succession is still as much an abstraction as *impression* is, in fact, an unintelligibility, unless on the supposition of some one conscious being,—subsisting through varying times. An appeal to memory is of no use here. Memory itself is but a phrase for the act of one and the same conscious being subsisting and recognising impressions in successive times. The unity of the conscious being is the ground of memory; not memory the ground of it; as this unity is equally the ground of the possibility of a known relation of succession, or successive impressions. Prof. Huxley does not recognise this in its proper place; he even in the end gives in his adhesion to Hume's denial of a *self* or unity in consciousness at all. But by this he cuts away all ground of right to acknowledge relation in knowledge; all ground in fact to affirm or deny anything.

Hume at once naturally takes up the question as to the kinds of impressions conveyed, as he phrases it, through the senses. His answer to this question may be said to be that all we know through the senses is of the same kind, whatever be our natural belief to the contrary. Figure, bulk, motion, colours, tastes, smells, sounds, heat and cold—pains and pleasures, from application of objects to our bodies—are all simply impressions or conscious states—each class has but the same "interrupted and

dependent being." They are "nothing but perceptions arising from the particular configurations, and motions of the parts of bodies." In that sentence lies the main inconsistency of Hume; and it is a key to the constant shifting of ground, which, with all deference to the admirers of the consistency and cogency of his reasoning, nullifies large portions at once of the "Treatise of Human Nature," and the "Inquiry Concerning Human Understanding." For if the senses can in no way give us more than a conscious impression, they are absolutely impotent to tell us of a body which is not itself merely a conscious impression. And to say, therefore, that bodily motions are the antecedents or causes of conscious impression is simply to say that conscious impression is the antecedent or cause of conscious impression. If Hume assumes that the senses do more than this, and distinctly inform us of objects called body and bodily motion, then he contradicts his own doctrine regarding the reach and sphere of the senses. And if he holds that body is the cause of impressions, he must admit a clear knowledge both of body and of what it can do.

But Hume is represented as stating and refuting with effect "the arguments commonly brought against the possibility of a causal connection between the modes of motion and the cerebral substance and states of consciousness" (p. 76). Hume's argument is as follows: Cause is simply constant conjunction; *à priori*, anything may produce anything; no reason is discoverable why any object may or may not be the cause of any other, however great or little the resemblance between them. Thought *may* therefore be the effect of motion; we may perceive a constant conjunction of motion and thought. Nay, it is certain we have this perception, "since the different dispositions of the body change the thoughts and sentiments." Hence "motion may be, and actually is, the cause of thought and perception."

In this so-called proof Hume evidently felt in a dim way the force of the objection, that, on his doctrine, thought and motion are really identical, that in fact he was only surreptitiously begging for motion, a character which his system denied it—the vulgar realistic view—in order to prove that thought as a distinct thing from motion was yet produced by it. Accordingly we find a clause, as is Hume's manner, quietly inserted to blunt this criticism by the way. "We find," he says incidentally, "by the comparing the ideas that thought and motion are different from each other." Possibly enough that is so; but the difference, whatever it may be, cannot, on Hume's doctrine at least, be allowed to extend beyond the common genus of conscious impressions; and it is, therefore, wholly irrelevant to his argument.

Prof. Huxley must know that all psychologists of note, and of the most different schools, from Hartley to Hamilton, have admitted the fact of "constant conjunction," of bodily organic impressions with conscious sensations and perceptions. But after all that Prof. Huxley has said, as to the place which this organic impression has in the production of the sensation, the questions remain whether it is the cause, or a concause, or merely a condition, on which a higher power comes into play. Prof. Huxley has surely read of the fact of mental absorption—that state of mind in which, when it is occupied by strong emotion, or by intense thought, all the organic impressions may take place,

and yet no sensation follow. When a person is writing, the clock may strike in the room, the impressions on ear, nerve, and brain being complete, and yet the next moment he may have not the slightest memory of the sound; certainly, at least, not the consciousness or memory which in ordinary circumstances he would have had. These organic impressions have thus to meet as it were with something other than themselves—something we call consciousness or mind—ere even sensation becomes actual, or a mental fact. This truly reduces them to the place of a simple concause, and shows that there is another factor which they do not necessarily command, and which must concur in the realisation of the very lowest form of mental life. Then these physical antecedents relate to but the lower phenomena of mind. Even if it can be shown that imagination and intellect use portions of the brain, it must at least be admitted that they are there to use them. Can it be said that the apprehension of relations, or the act of generalisation, or volition, is properly spoken of as a conscious *impression*? Does Prof. Huxley imagine for a moment that any careful psychological analyst would place such operations on a level with the consequent of a series of organic movements?

Again, what is the real meaning of the phrase that "the operations of the mind are functions of the brain, and the materials of consciousness are products of cerebral activity?" (p. 80). Prof. Huxley quite sees and admits that this is what is called "materialism," and indeed it is nothing else. One ought to thank him for his candour. But I should like very much to know the precise meaning of the statement so characterised. When analysed, it means this: that the nervous current generated by the brain out of food and blood is transmuted into mind; that as a certain molecular motion is transmuted into heat, so a certain nervous motion is transmuted into consciousness or mind. Now it seems to me, on the other hand, that not even sensation, to say nothing of intellect or the apprehension of relations of succession, coexistence, similarity, has been shown to be the transmutation of nervous force. We observe that physical forces are transmuted into each other; we can even quantitatively determine equivalents in this case. But the method fails us the moment we seek to show that or how a state of consciousness is a transmutation of the unconscious. For now we are no longer dealing with forces of the same kind—forces equally objects of consciousness itself—and known to be, to a certain extent, numerically determinable; we are dealing with the unconscious and the conscious; we are trying to bridge a gulf, on the further side of which we have no basis. We have no measure or rule for showing how the unconscious and the conscious are convertible, or that they have any conceivable relation whatever. Besides, even if we get sensation out of nervous force, what of the relations of difference, resemblance, succession, and coexistence among those sensations? Mr. Huxley calls these *impressions of impressions*. This is a very inaccurate expression. An impression of an impression must at least be picturable in the imagination. It is not so here. These relations are discerned by the intelligence; they suppose impressions; their material or nerve-antecedent is not observable, and they can in no way conceivably be referred to physical

movements. Further, a physical or brain-force, though it give one definite sensation, or even a series, cannot provide for the pervading unity of self-consciousness. Physical forces, which are perpetually changing, successive and different, cannot be made convertible with the sense of unity which pervades all our consciousness. And further, the consciousness of a series of impressions, even of two impressions, the recognition of this fact or relation, its being in our consciousness at all, implies a standing unity of consciousness, a self or being, one and identical, which may be awakened into conscious life in or through those impressions, but which is in no way made by them—rather, is necessary to their being made or known.

But is Prof. Huxley's conclusion at all consistent with the law of physical energy? According to the law of the transformation of energy, the energy represented by motion or molecular change in matter passes into a consequent, which is also a movement or molecular change. The antecedent and the consequent states are still only forms of molecular change; and the amount or quantity of the antecedent is represented by the amount or quantity of the consequent. There is transformation of energy; but there is no change in the kind of the consequent. Now according to Prof. Huxley, a state of consciousness called sensation, or emotion, or idea, is as much the result of "the molecular changes which take place in that nervous matter which is the organ of consciousness, as the nerve-vibrations are the result of the impact of the light-waves on the retina." At the same time Prof. Huxley holds that the state of consciousness is distinct in kind or quality from the physical movement. It is psychical, or a form of *psychosis* as opposed to *neurosis*. And indeed he must admit a distinction in quality in the two cases. For the physical movement is possible—nay, is actually carried on apart from consciousness; whereas the sensation, the very lowest form of consciousness, is possible, is actual only in consciousness itself. There is all the difference between the fact which depends on observation by eye-sight and the feeling which is self-guaranteeing while it lasts, between the unconscious observed and the conscious felt. But be this as it may, he admits the distinction, as in fact impassable in thought. How is it then consistent to say that the state of consciousness is the effect of the physical movement? Either the law of physical energy is observed, and then we have only a physical movement as the determined result; or it is not, and then we have a state of consciousness, something distinct in quality from a physical movement; that is, we have as the result of the given physical force that which was not contained in the force as a simple quantum of physical energy.

But Mr. Huxley, following, as he thinks, Hume, tells us somewhat singularly that this materialistic doctrine of the origin of mind "contains nothing inconsistent with the purest idealism" (p. 80). In other words, what we call matter turns out in the end to be a purely hypothetical entity, assumed as a cause of certain states of consciousness. The very conception of such an entity is inconsistent with the basis here given; for if our sense-knowledge, indeed all our knowledge, be restricted to states of consciousness called feelings, we are precluded from forming an idea even of matter as an

object transcending consciousness, or of anything but states of consciousness, their compounds, and relations among themselves. To speak of "matter" as a cause of our feelings is, on such a theory, meaningless; and such a cause as an inference is impossible. Matter and motion, then, are simply convertible with states of consciousness, in fact, with feelings. And when we are told that these phenomena precede and cause the states of consciousness we call sensations, emotions, thoughts, we say merely that one set of states of consciousness is antecedent and cause of certain others. We have, therefore, wholly given up the dualistic scheme and the aim with which we started, viz., that of explaining the feelings by material phenomena. We now really profess to explain the whole of our conscious states—or mind—by one set of its states or phenomena, viz., those we call matter and motion. But does Prof. Huxley not see the *petitio principii* involved in such an argument? When I am cognisant of the phenomena, matter and motion, have I not assumed consciousness and its states to account for consciousness and its states; or rather, which is worse, have I not assumed certain very elementary states of consciousness—to account for, in fact, to generate the whole contents of mind—in all their complexity and reach—intellect, emotion, desire, volition, and moral sense? This is cutting the knot coarsely with a hatchet. It is not even solving the problem as to how from rudimentary states of consciousness itself, mind can rise to its recognised fulness and complexity—rise, in a word, to that which we call matured consciousness.

J. VEITCH

SACHS'S VENEZUELA

Aus den Llanos. Schilderung einer naturwissenschaftlichen Reise nach Venezuela. Von Carl Sachs. (Leipzig: Veit, 1879.)

NO one who has a liking for natural history should omit to read Dr. Sachs' account of his adventures in the Llanos of Venezuela. German books of travel, though possessing a large amount of solid information, are often rather dry and heavy. But Dr. Sachs' volume is certainly an exception to the rule, and may, we think, be placed, as regards the interest of its narrative, nearly, if not quite, on a par with the well-known works of Bates and Wallace.

The late Dr. Carl Sachs, who was formerly assistant to the great physiologist of Berlin, Emil du Bois-Reymond, and lost his life in an unfortunate accident on the glaciers of Monte Cevedale in August, 1878, went out to Venezuela, not with the ordinary objects of the travelling naturalist, although no opportunity was lost of collecting specimens, but for the especial design of obtaining a better knowledge of that most wonderful of fishes commonly called the electric eel (*Gymnotus electricus*). No more appropriate use could certainly have been made of the "Humboldt-Fund," collected in order to preserve in memory that great naturalist, than the devotion of it to such a purpose. Humboldt's account of the electric eels and the mode of their capture, is among the best known portions of his travels. Nearly eighty years had passed without any naturalist having trodden in Humboldt's footsteps, or having attempted on the spot the further elucidation of the extraordinary properties of

this fish, aided by the enormous development which the science of physiology had made since that period.

With this object, therefore, Dr. Sachs left Europe in October, 1876, determined to visit the home of the electric eels in the same streams that Humboldt had found them in the year 1800. To arrive at this destination is not in these days a matter of great difficulty. From Hamburg a swift ocean-steamer bore our naturalist to La Guayra, and a day's ride over the coast chain of the Andes brought him to Caracas, the capital of Venezuela. After a few days' spent in rest in this lovely city and in excursions in the neighbourhood, Dr. Sachs turned his face due southwards, and, accompanied by servants and baggage-mules, rode over the grassy plains, or Llanos, which cover the southern part of the republic. Ten days' travel brought him to the little village of El Rastro, situated on one of the small confluent of the Rio Sisnado, a branch of the Orinoco, the very spot where Humboldt had captured *Gymnoti* seventy-six years before.

Humboldt's account of the mode in which this operation was effected in his days is well known. The Indians "fished with horses." About thirty wild horses and mules from the Llanos were collected and driven into the river. The stamping of the beasts drove the eels out of their hiding-places in the mud into the middle of the stream, where they got under the bellies of the horses and attacked them with repeated discharges of their electric organs. The unhappy quadrupeds rushed out to the banks, but were driven back into the water by the shouts and sticks of the surrounding Indians, until many of them, exhausted by the repeated shocks of the *Gymnoti*, sank to rise no more. The eels thus lightened of their superabundant stock of electricity were easily captured by the Indians.

Such is Humboldt's well-known story. But strange to say the Venezuelans of the present day simply laughed when Dr. Sachs proposed to put a similar plan in operation, and said they had never heard of such a thing. Indeed Dr. Sachs after various inquiries on the subject, was at last driven to the conclusion that fishing for electric eels with horses, as described by his illustrious countryman, must have been quite an exceptional occurrence, and could never have been a recognised custom.

In fact, Dr. Sachs was altogether unsuccessful in inducing the people of El Rastro to procure him electric eels in any way, and, after some rather disheartening attempts, shifted his quarters to the neighbouring town of Calabozo, where he hoped to find better quarters and a more intelligent set of assistants. Here, also, although his offers for electric eels were raised to ten pesos (about 30s.) a head, the fishes did not "come in," and poor Dr. Sachs was almost beginning to despair, when he fortunately heard of a certain "Llanero"—General Guancho Rodriguez—the very man for the occasion. How under Don Guancho's generalship these redoubtable eels were at length captured and brought home to the doctor's laboratory at Calabozo, how the necessary experiments were conducted to the wonderment of the good Calabocenos, and how Christmas is passed in that city, is all well told in some entertaining chapters, which will be much appreciated by those who read Dr. Sachs's narrative. It must suffice for us to say that during Dr. Sachs's stay at Calabozo, which lasted until March, 1877, the main objects of the expedition were fully attained, and a number of important researches