

Tiddler's Ground" and an interview with "Mr. Moses," the leading character in Mr. Dickens's story. The lady gave a very graphic sketch of the "Hermit," and closed with these sentences:—

"Charles Dickens offended him terribly. He pretended he was a Highlander, and Mr. Lucas at once began to question him about the country, and then spoke to him in Gaelic, which he could not reply to. Mr. Lucas said to him, 'Sir, you are an impostor; you are no gentleman.'"

This Mr. Dickens declares to be "a sheer invention of the wildest kind" (letter of March 27, 1862); and he proceeds to state the names of those who were present when he had with the "Hermit" the now famous interview.

FRANK FINLAY.

The Editor will be glad if the Secretaries of Institutions, and other persons concerned, will lend their aid in making this Calendar as complete as possible.

APPOINTMENTS FOR NEXT WEEK.

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| SATURDAY, Jan. 29, 2 p.m. | Physical: Dr. A. Schuster on "Electrical Theories;" Mr. C. Baker on "An Optical Bench." |
| " " " | Royal Institution: Mr. J. T. Wood on "The Discovery of the Temple of Diana, &c., at Ephesus." |
| " " " | Crystal Palace Concert (Beethoven's Mass in C). |
| " " " | Saturday Popular Concert, St. James's Hall (Bilow). |
| MONDAY, Feb. 1, 2 p.m. | Royal Institution: General Monthly Meeting. |
| 4.30 p.m. | Musical Association: Mr. C. E. Stephens on "The Fallacies of Dr. Day's Theory of Harmony." |
| 5 p.m. | London Institution: Professor Pepper on "Functions of the Brain," I. |
| " " " | Entomological. |
| 8 p.m. | British Architects, Medical, Society of Arts: Cantor Lecture VI. |
| " " " | Monday Popular Concert, St. James's Hall (Bilow, Norman-Nemlo). |
| TUESDAY, Feb. 2, 3 p.m. | Royal Institution: Mr. E. Bay Lankester. |
| 8 p.m. | Civil Engineers: Professor Prestwich on "The Origin of the Chesil Bank." |
| " " " | Society of Arts: Pathological. |
| " " " | Royal Albert Hall: Orchestral Concert (Wilhelm). |
| 8.30 p.m. | Zoological. |
| " " " | Biblical Archaeology: the Rev. A. H. Sayce on "Human Sacrifice among the Babylonians;" Herr F. J. Lauth on "The Date of the Nativity." |
| WEDNESDAY, Feb. 3, 8 p.m. | Microscopical Anniversary, Pharmaceutical, Obstetrical, Society of Arts. |
| " " " | Mr. H. Holmes's Fifth Musical Evening, St. George's Hall. |
| THURSDAY, Feb. 4, 3 p.m. | Royal Institution: Professor Tennant on "Subjects connected with Electricity." |
| 6.30 p.m. | Royal Society Club. |
| 7 p.m. | London Institution: Dr. Zeffi on "The Grotto in Indian Art." |
| 8 p.m. | Linnæan. |
| 8.30 p.m. | Royal Antiquaries. |
| FRIDAY, Feb. 5, 4 p.m. | Archæological Institute. |
| 7.30 p.m. | Geologists' Association. |
| " " " | Sacred Harmonic Society, Exeter Hall (Mendelssohn's <i>Athalia</i> , &c.). |
| 8 p.m. | Royal Institution: Weekly Evening Meeting. 9 p.m. Mr. Jones Dewar on "The Physiological Action of Light." |
| " " " | Philological: Professor J. B. Mayor on Rhythm, II. |

SCIENCE.

RIBOT ON HEREDITY.

Heredity; a Psychological Study of its Phenomena, Laws, Causes, and Consequences. From the French of Th. Ribot, Author of "Contemporary English Psychology." (London: Henry S. King & Co., 1875.)

It may be affirmed with much truth that if we wish to learn what pursuit ranks highest in public opinion, we shall find it in the career of those men to whom statues are

erected by public subscription. It happened that the writer of these lines not long since revisited Cambridge, where, as he walked admiringly among the many new improvements, his eyes fell upon a recently erected bronze statue. It was the only out-of-door statue in the whole town; it occupied a commanding position in the market-place, hard by the University Church, and only a few steps from being in full sight of the Senate House. He walked reverently up to it, pondering as he went as to the manner of the man whose memory it so proudly perpetuated, and lo! it was Mr. Jonas Webb of Babraham, the famous breeder of Southdown sheep. The erection of this statue by the agriculturists of a county in whose capital a great university happens to be located, is worthy of note. It expresses their genuine appreciation of the practical application of the laws of heredity to all descriptions of farm produce, and it may be accepted as an omen that the time is near when the study of those laws and of their logical consequences shall permeate the philosophy of the university. It must do so, because there is no branch of science which refers to bodily structure or to mental aptitudes, neither is there any theological doctrine in which the theory of heredity, either directly or as one of the principal agents in evolution, can hereafter be left out of consideration.

In the course of formation of every science there has always been an embryonic or pre-scientific period. Nothing then existed but detached pieces of evidence, of an unsatisfactory kind, laxly discussed and explained by wild hypotheses. But, at length, the methods of science succeeded in catching with a firm grip some of the loose materials, then more was seized, and so, with an ever-increasing rapidity of conquest, the whole of them became gathered together within the pale of law. Heredity has at the present time developed into a science; much is definitely established, and many questions seem to require for their solution little more than direct experiment or the simple but careful collection of statistical facts. There is consequently some need of a work that shall concisely and clearly set forth what is already known, and what are the undecided questions which most urgently call for solution and might at the same time be solved by any person, who chose to devote a fair amount of intelligent and steady work to the purpose.

M. Ribot's book does not do this; it is not a work on a level with the present knowledge, but it takes us back to the pre-scientific stage of heredity. It again brings to the light old anecdotes of questionable value, and again treats with seriousness, hypotheses that have become obsolete. Speaking generally, the work is that of a partially informed and very speculative writer, and by no means that of a man of science. It is written in a somewhat pretentious style, which has the effect of making the reader believe that some great discovery is about to be announced, and of fixing his attention until he reaches the end, when the deferred hope proves never to be realised. As examples of the kind of information which he freely accepts as evidence—among the illustrations of longevity, we are told

that "a collier in Scotland prolonged his hard and dreary existence over one hundred and thirty-three years." We next have, as an example of exceedingly acute sense, a story extracted from Prosper Lucas, who was much too credulous of wonderful stories, of "Hirsch Daenemarck, a Polish Jew, who about the year 1840 travelled over Europe, showing by decisive experiments that he could read in a closed book any page or line that might be desired;" and of his son, aged ten, who "possessed this same faculty in perhaps a more remarkable degree." Curiously enough, I happen to know something about this very case, which was mentioned to me two years ago as an avowed instance of extraordinary memory. The subject of hereditary memory was and is of interest to me, and I therefore wrote to a very eminent and learned Jew, to whom I was referred for information. His reply lies before me: I do not repeat the names in his letter, as I did not ask permission to do so. This is an extract from it: "The feat to which you allude was performed by a Jewish rabbi, whose name, I think, was Hirsch Norwegen, who was popularly called the 'Sihah-Pole'—i.e., the Talmud Pole ('Sihah' being composed of the initial letters of the Hebrew words meaning 'the six sections' of the Talmud), and who, travelling through the principal parts of Europe about the year 1848, astonished even such men as—in Berlin,—in Prague, and—in Padua. He was not only able to tell the words which a pin thrust through one leaf in any part of the Talmud would pass on the next, but on any number of subsequent leaves." In fact, he had learnt the enormous work (thirty-six volumes) more or less by heart, through the aid of a local as well as verbal memory of wonderful power, devoted to that end only. My correspondent gave me particulars of another instance of extraordinary memory of the same kind that existed in his own family. His father, "when he was seven years old, could say by heart the whole of the Pentateuch in Hebrew, verse by verse, together with the remarks of the principal commentators, Parhi, Ebn Ezra, and Rashbam; and throughout life—he died aged seventy-seven—his knowledge of the vast Talmudical and Rabbinical literature was such that he was constantly appealed to for pointing out the sources of obscure references or allusions; and, in fact, he never seemed to forget anything—whether pieces, persons, facts, or ideas—with which he had once become acquainted." I have reason to believe that a powerful memory, exact in all matters of detail, is a characteristic of the Jewish race. M. Ribot says there is a lack of evidence to prove the heredity of strong memory; on the contrary, I find it abundant. It existed, as we have just been informed, in the family of Hirsch Daenemarck, and it exists in the family of my correspondent. But to proceed with M. Ribot's book. He quotes Le Vaillant on the half-breed children of the Europeans and Hottentots, that the moral nature is always determined by the father. When the father is a Hottentot, "the child has always the good nature and gentle and kindly affection of the father;" but, in the converse case, they have "the germs of all vices and unruly passions." (!) Again,

he quotes, apparently with perfect approval, the opinion "that there is an invariable connexion between the heredity of physical resemblance and the heredity of moral resemblance." I can only say that I have been so struck by the number of cases in which the child who had the features of either parent had *not* the character, that I should hardly be surprised if they proved to be the more numerous; but I have never as yet gone statistically into this question. Then he indulges in some absurd views about likeness descending through opposite sexes, and quotes approvingly a belief that the son is more like to his mother, and, through her, to his *grandfather*, than he is to his *father*.

The inaccuracy and feebleness of his deductions is, in many instances, very striking. Here is one which is perfectly inexcusable in a writer on heredity; he is speaking of the transmission of acquired habits, and uses an often published anecdote to prove his case. He says:—

"Habit is defined to be an acquired disposition. We ask if any purely individual habits are transmitted? Instances of this are cited. Girou de Buzareingues observes that he had known a man who had the habit, when in bed, of lying on his back and crossing the right leg over the left. One of his daughters had the same habit from birth."

The only meaning to be attached to this is, that the man had no special instinct to cross his legs, that from some cause or other he did so, that he acquired the habit of doing so, and that he transmitted this acquired habit by inheritance to his daughter. But what possible right has anyone to infer from the story, as it is told, that the man's habit was not just as instinctive as that of his daughter? Everybody who knows anything of heredity is well aware that one of the most interesting questions at the present time concerns the possibility of transmitting acquired habits. There are some few, very few, well-known instances of it in animals, but hardly any in man, while there are a vast number of other instances in which acquired habits are most assuredly not transmitted in any recognisable degree. The question is of extreme interest in its bearing upon the rate and *direction* of evolution, and therefore every bit of evidence about it deserves the closest scrutiny; but M. Ribot passes complacently on, careless and unconscious.

It is necessary to draw serious attention to the large amount of unacknowledged plagiarism which characterises this book. M. Ribot has been immensely indebted for its general design, and for very many facts, to the well-known work of Dr. Prosper Lucas, *Hérédité Naturelle*, as the reader will sufficiently recognise by comparing the two tables of contents, but I myself am aggrieved yet more directly. I find the tables and genealogies that I had compiled, after very considerable research and sifting, and which I published in *Hereditary Genius*, appropriated without a word of acknowledgment. They are clipped and condensed, and a trifling number of names are varied, but that is all, and M. Ribot thinks fit to give this plagiarised version of the families of the principal poets, painters, musicians, men of science and of literature, statesmen, and commanders, ex-

actly as if they were the fruits of his own discrimination and research. Nay worse, he mentions in three separate cases out of the whole number of them, that the genealogy of those cases was given after me, thereby implying that I had nothing to do with the rest. It is the more vexatious because he shows himself incapable of making the most of the materials he has thus conveyed to his own use, as, for example, in his tables of maternal and paternal influence, where he quotes a few cases on either side merely as anecdotes, and does not attempt to work the subject quantitatively.

The book improves towards its close, because the topics with which that portion of it deals, are more in accordance with the bent of the author's mind. He develops with effect the views that have of late become familiar to English readers, of the large part played by unconscious cerebration in intellectual acts, and in one of his best passages he ascribes genius (as I myself have lately done, in ignorance that M. Ribot had anticipated me) to a large development of that portion of the mind. He says:—

"The highest creations of the imagination spring from the unconscious. Every great inventor, artist, man of science, artificer, feels within him an inspiration, an involuntary invasion, as it were, coming out of the depths of his being, but which is, as has been said, impersonal. All that comes under consciousness is results and not processes. The difference between talent and genius is the difference between the conscious and unconscious. Artists, prophets, martyrs, mystics, all those who in any degree have felt the *furor poeticus*, have ever acknowledged their subjection to a higher power than their own *ego*, and this power is the unconscious overlapping the submerged consciousness."

The word "talent" in the above is open to objection, because it is usually understood to mean an "instinctive gift," and instinctive motives are not necessarily "conscious." The phrase ought to run "between steady brain-work and genius." I may add, that a woman's intelligence appears to have a larger proportion of the unconscious element in it than the man's, for it is notorious that she frequently arrives at just conclusions, though the only reasons she is able to assign may be eminently illogical.

Much is said in the book about free will, but nothing worthy of note is advanced. There is also an eloquent passage about the decay of the Greek genius, which is ascribed to the effects of "nature," but unhappily, the author does not even profess to understand the meaning of that phrase. He says:—

"Clearly heredity has nothing to do with this decay; but then if it is transmitted to the next generation, and if, further, the same causes go on acting in the same direction, it is equally clear that heredity in turn becomes a cause of decay."

These "ifs" and the uncertain conclusion, and the general haze that overspreads the passage, are characteristic of the author's style of reasoning.

In conclusion, I would remark, that it is usually as profitless as it is an ungracious task to pick out the defects in a man's work! Both the critic who studies it for his own information, and the reader of his criticism want, or ought to want, nothing else than to learn all of sterling worth that it contains.

But in the present instance, no choice seemed open to me but to find fault, for I laid down M. Ribot's volume after honestly reading every line of it, with a weary sense of many wasted hours.

FRANCIS GALTON.

SCIENCE NOTES.

PHYSICS.

The Theory of Mouth Organ Pipes.—The process by which the air in an ordinary mouth organ pipe is set in motion is usually represented plausibly as follows:—The current of air which issues from a narrow slit comes in contact with a sharp edge on which it breaks, producing a hissing sound which is supposed to be made up of an unlimited number of notes each with an independent pitch of its own. The air-column of the pipe selects and strengthens that particular note of the confused sound with which it can vibrate synchronously, and renders it musical. According to another view of the matter, a portion of the air which issues from the slit and strikes against the lip of the pipe is urged into the pipe, there producing a compression which reacts on the air-current and deflects it. This phenomenon is repeated periodically, the length of the air column in the pipe determining the time of a vibration. M. Sneebeil, in *Pogg. Ann.* cliii. p. 301, describes experiments which induce him to regard the production of a note in a mouth organ pipe in a different light. He considers that the air-current which issues from the slit builds there a sort of air-reed, whose action in the excitement of vibrations in the mass of air in the pipe is analogous to that of the tongue of a metal reed in an ordinary reed pipe. If the slit be adjustable and be so placed that the stream of air falls entirely on the outside of the lip, the pipe gives no sound until by pressure from without the air-formed reed is bent inwards. A similar application of external pressure is required to deflect the air-reed when the slit is so arranged that the current of air passes entirely inside the lip. In a series of letters recently published in *Nature*, Mr. Herman Smith has expressed views which appear to be in close agreement with those of M. Sneebeil.

Frigorific Effects produced by Capillarity combined with Evaporation.—Professor Decharme (*Annales de Chim. et de Phys.*, sér. v. tom. iii. p. 236) states that when a roll of bibulous paper is placed vertically with its lower extremity dipping into bisulphide of carbon, the liquid rises by capillary attraction, and after a few minutes the upper portion of the paper is covered with a layer of a white semi-crystalline substance which gradually extends downwards to within two centimètres of the surface of the liquid. The formation of this solid substance arrests the further capillary ascent of the bisulphide. The deposit was found on examination to be ice, its formation being due to the condensation of the aqueous vapour in the atmosphere, brought about by the cold resulting from the evaporation of the bisulphide of carbon over an extended porous surface. The temperature of the air at the time was 20°C., but the phenomenon was equally striking at higher temperatures, and even when the bisulphide of carbon was in a state of ebullition. When the bibulous paper enveloped the bulb of a thermometer, the temperature fell from 20° to -15°. The author proposes to employ an arrangement of this kind as a hygroscope. Water in a thin test-tube may be readily solidified in this way, the test-tube being enveloped in a roll of blotting-paper the extremity of which is dipped for a moment in bisulphide of carbon; according to the size of the test-tube and the quantity of water in it (less than five centimètres in height) will the time required for the solidification vary from two minutes to half an hour. If the bisulphide contains substances in solution (*e.g.*, sulphur, phosphorus, etc.), the same phenomenon takes place, with this exception, however, that the deposit