

child up to a moderate standard of excellence, there is necessarily a great deal of repetition and drill, which involve a terrific waste of time for the more intelligent children. These children are, however, the very ones who ought to go to college, and the result is that it is seldom for their interest to remain in the regular classes of a public school. There is another cause.

Again, all the colleges require for admission a knowledge of Greek, which is taken a year of average intelligence a full year's study to acquire. Now it is plainly not the business of the State to require that girls who go to high-schools to study Greek at all, and they do not do it. The teaching of Greek must, therefore, be maintained in a high-school at a considerable expense for the benefit of only two, three, or but just one out of the possible a large part of the time of the most intelligent teacher in the school is thus lost to the more ordinary and given to the very few. The immediate and certain scientific school-conditions are less and less willing to make for the sake of a foreign and contingent good. The difficulty is of course less felt wherever, as in Boston, a separate high-school is provided for each sex (and it may be hoped that this will be the nearest future), with the spirit of physiological and pedagogical liberalism, the practice of providing separate high-schools for boys and for girls may, in the interests of both sexes, become universal.

It is of great importance, as Mr. Elliot very justly says, "that the way be kept wide open from the primary school to the professional school (i. e., the college) for the poor as well as the rich," and he suggests that the desired connection between the secondary schools and the colleges might, in part, be secured by changes in the requisites for admission to college on the one hand, and in the studies of the existing high-schools on the other.

"If the colleges would accept, at the option of the candidate, a year's work in French or German, for the year's work in Greek which they now require, and the latter would make Latin a ministerial part of their course of study for all pupils, the desirability of the more liberal studies would be practically effected. In the case otherwise of the college there is much to be said in favor of such a change in their requisites for admission, and in the interest of the high-schools there is much to be said in favor of making Latin an important part of their prescribed course of study."

This recommendation, we believe, created a good deal of discussion in Cambridge among the friends of the college, who understood it to mean that Greek as a required study, either before admission or after admission, is to be thrown overboard, and who object to it that it is rather a proposal in the direction of lowering the standard of the college than of elevating that of the schools.

—The controversy which has long raged both in England and this country over the vivisection of animals by physiologists, and which, in this latter, has recently threatened to produce prohibitory legislation, has led to the publication of an interesting little brochure on the subject by Dr. J. C. Daxton, Professor of Physiology in the New York College of Surgeons and Physicians, writing both the character, necessity, and results of experimentation on animals (F. W. Christian). As an illustration of the necessities of some such vivisection of the subject as he offers, he quotes a writer on the other side in the *Evening Post*, who maintains that, even if vivisection is so useful from a scientific point of view as its advocates pretend, "maintained law is not so right in the knowledge thus acquired," and demands legislation "to put a stop to those vivisection contributions to human knowledge which mankind would be all the better off the never knowing." The gentleman who said this is evidently not a person to be argued with; but there is a large number of persons who, while admitting liberal views as to the claims of science, labor under great misapprehensions as to the character and utility of vivisection. Nobody can read our well done the treatises of making the lower animals subservient to the preservation of human life, and when we know the circumstances, as Dr. Huxley does, that no more pain is inflicted in vivisection animals for scientific than in killing them for purposes of preparation, and that vivisection has made, and is making, contributions of general value to the medical art, we do not need to argue, as he so aptly remarked, whether there be any attainable knowledge which man has no moral right to acquire.

—In the first place, all experiments on living subjects performed by physiologists allow the use of ether. There are often cases in which the object is to discover the existence of pain under certain conditions, but it is then more the pain inflicted is slight and brief, for it does not need to be either sharp or prolonged in order to obtain the speaker's ends. It cannot be said, in fact, that animals can ever torture animals, in any proper sense of the term. In the second place, the physiological life, which are the main objects of interest to the medical man, can only be observed in living animals, especially in that most important field, the relation of the nervous system to the vital functions. Some of Dr. Huxley's examples of the contributions which vivisection has made to medical science in this field

are highly interesting. Through some of the experiments now going on, for instance, it seems probable that we are on the eve of the discovery of the cause, and therefore, perhaps, of the cure, of that terrible disease diabetes. Thus the circulation of the blood was discovered in this way: as was the function of the lungs in creating the blood; as the possibility and value in certain cases of artificial respiration; as the possibility and value of the transfusion of blood; great light has been thrown on the digestive process in the same manner. Nearly all the knowledge we have of the nervous system comes from the same source, and particularly the fundamental and most fruitful fact of anatomy, that "the anterior and posterior roots of nerves emerging from the spinal cord have distinct functions, the anterior roots being destined for motion, the posterior for sensation." The Huxleyian operations for aneurism was made possible by previous experiments on dogs; and the improvement of the lens, after failures in human, through contact with the perforation in fishes covering to which it is analogous, was accomplished in the same manner. The proper mode of treating various eye diseases, and the origin of gonorrhoeal diseases, are also among the contributions to human good, but we add also to these improvements made by dogs, mice, rabbits, guinea-pigs, pigs, and other animals, many entirely self-objects in experiments on them, which might be proposed sensibly to have himself and his family treated, in case of aneurism or diabetes, as if an intervention had ever been performed. To prevent against and diminish a thing, while profiting by it, is not only logical but just.

—Miss Putnam is not satisfied with Dr. Huxley's report, and writes to us:

"—There are the distinct points at issue:

"The National Board (1871) shows from a very thorough and complete census, that over 1,000 reports and 1,000 colored children of school age in this country. The School Reports also show that have been reported in the last year, for school purposes, a total sum of \$144,000. From the last census as my commission the sum expended for colored children in the last year was \$100,000, or an additional \$44,000 for the year. The School Reports show that there would have been more schools, or more pupils, than there are in the country about five hundred colored men who pay their contributions to one dollar each per year, and their property tax, for school purposes, which for the last year was \$100,000, or an additional \$44,000 for the year. The School Reports for three years the colored town of Worcester, with 100 school population, paid their tax, and had no school. There was 700 white school population in Worcester, who had expended for its benefit, in three years past, from the school fund, \$1,700,000. The statistics in regard to Worcester are all from the "Register," having been furnished to me by the eye-witness. The information I explicitly ask for, and respectfully ask Mr. Huxley to obtain from official records, is the amount of money expended and in what way for school purposes in Northern Massachusetts County since the schools in the County were opened, and the amount of money expended and in what way for the colored children. It is not only a fair and equitable matter to be settled by the annual State Census. It is not only a fair and equitable matter, but it is a matter of the distribution and efficiency of the school system for the colored children in this county, as far as the public money is concerned. I feel your readers will notice Mr. Huxley is entitled to say the colored children have "one-third the number" having received of the "number enrolled in the schools in the State" and not that they have one-third of the school fund expended for their length. The School Report for 1871 gives 10 white schools and 2 colored schools in Northern Massachusetts County, and showing attendance, notwithstanding the 1000 colored in Worcester."

It seems to us that Miss Putnam here makes up her charge by leaping hither and yon, during two of which the Virginia children claim that no provision was made for colored children. What they say is that they are increasing their school accommodations, and that they do not need to require it to be complete before 1872. The controversy, therefore, seems to be in a barren one; but, however profitable, it will rather be an unavailing. We wish, however, Dr. Huxley would prove to Miss Putnam a right of the County Treasurer's books, though we must decline publishing the result of her investigation.

—A correspondent asks the information on books relating to the development of evolution theory, especially for the book "which is not too general or too technical, but gives the facts and reasoning with reference to it on both sides." From a literature which has in the past three years grown into an extensive department of bibliography, we ought to be able, if this were possible in any subject of discussion, to select the book which fills these requisites. Yet it would be vain to seek, even in Germany, for one which answers in these qualities the brevity and force of the earlier, namely, Darwin's "Origin of Species," in which, and especially in the last edition, 1872, all the accurate allegations that have been urged against the theory, as it is held by Darwinists, are more or less fully and fully considered; that in any reader we could ever see, as the result of a subject of which the scientific evidence is so completely exhausted, the facts of factuality less obscure, and in less difficult this is still further revealed by a glossary of scientific terms. But before we can clearly characterize other

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books on this subject, it is necessary to make a grand division of the department into books that are strictly (like Darwin's), or predominantly, scientific and inductive; and those that treat their subject as a part, or as the foundation, even like Mr. Spencer's notes, of general speculative philosophy, and in connection with theology and religion. Darwin's books have been improperly characterized as speculative. This is true of them only in the sense in which incompletely verified scientific hypotheses are called speculative in the sense in which Newton's astronomy was, until completely, or very nearly, verified; or (by a fairer instance) Newton's optics, which, in a main point, is not verified, but reversed.* It is to the subjects of Darwin's books, and not to his opinions or treatment, that the term speculative is applicable, if at all; and so far as it is applicable as a reproach, it applies equally, or even more, to the opinions of his opponents. His mode of treatment is strictly scientific, Newtonian, or "positive"; nowhere dealing with disputed axioms, or with deductions from axioms laid down as a *præsumptio* and as if they were not disputed; nowhere considering scientific theories as either favorable or unfavorable to general philosophical or religious conclusions, except, of course, where religious teaching is having prejudiced those questions on other than scientific grounds, as presumed to have exceeded by able hands its proper jurisdiction. With the great majority, however, of writers on this subject the names of Darwin and Spencer are closely associated; though in more than one Aristotelian manner, and to many scientific students of the subjects, no two names are more widely separated by essential differences of method. Mr. Spencer has lately put forward the claim that his method is justified by Newton's precepts and practice. But, according to the judgment of the more immediate followers of Newton, the leading physicists of to-day, this claim is not substantiated.

—The dispute is, however, quite aside from the reality of the distinction which, for bibliographical purposes, we here lay down. One of the requisites of our correspondence is not fulfilled by any book of the properly speculative division. We venture to assert that in no department of speculative philosophy, either expository or historical, do treatises exist which fairly present the facts and arguments on both sides. This virtue is possible only within the limits which scientific, Newtonian or "positive" method imposes; and within his own proper department of natural science every expert authority is a positive, whether on other subjects he fails, or ignores, or only wavers the disputed axioms. The essential characteristic of properly speculative as distinguished from scientific method is, that the former seeks to compel doubt by the familiar force of the dilemma that unless one accepts as having universal validity certain axioms, which it is not only unillustrated, not verified by inductive evidence, one is not entitled to hold any beliefs at all with any certainty. Certain axioms are therefore presented, illustrated, and a *noology* is deduced from them. True scientific virtue, on the other hand, is to balance evidence, and to bring doubts to cold terms; to resist the enthusiasm of these aggressive axioms, and to be contented with the beliefs which are only the most probable, or most authentic on strictly inductive grounds. Now in the proper scientific theory of "evolution," unacceptably so-called, as confounding it with a different mode of treatment, when any of the successive prevailing names, "descent with modification," "descent," "development," or "transmutation" would on this score have been better, notwithstanding a temporary dispute in the name—the scientific evidence is in great measure technical, and a considerable part of what has accumulated in the past fifteen years is buried from the general reader in monographs of scientific publications. Essays and discourses in exposition of Darwinian or natural selection are far too numerous; the majority being rather calculated to make the author shoulder than to illuminate what is best got from a careful reading of his original treatise. Among brief and good essays we may mention Professor Huxley's little books on the "Origin of Species," and "Man's Place in Nature"; Mr. Wallace's collection of essays with the title of "Natural Selection" (though some of these are too speculative to come under the head of natural science); and Mr. Mivart's "Genesis of *Man's* Species," which though learned in biological science, is in many parts too speculative or un-Newtonian to be mentioned under this head. We may add a little book called the "Philosophy of Evolution," by R. T. Lorenz, published in 1873, by Van Nostrand, London, which received one of the Actonian prizes of the Royal Institution for 1872. This is mainly scientific, though it touches on the general philosophical or speculative bearings of the subject. Of works more unacceptably of the specu-

lative class, Mr. Spencer's generally, but more especially his "Biology," deserve a first place. We should not, however, in this case, as we do in Mr. Darwin's, recommend the original so much as a recently-published exposition, which, under the title of "Cosmic Philosophy," is given by Mr. John Fiske. In this book, the disciple far surpasses the master in readability and skill of exposition. Of a large subdivision of the speculative class—the books whose aim is practical and religious, and opposed to theories of evolution—no one has come to our notice which fairly presents the exact points or the scientific arguments of the theory as it is now generally held by naturalists, and few of them apparently deem it essential to their aim to do so. Finally, we may add to the scientific division of books on the subject a recent edition of Darwin's "Descent of Man," reviewed by the fiery critic of criticism to which the first edition was subjected, and perfected, so far as scientific fairness and method can go, by the author's unbounded patience of thought and research.

—Publication of the posthumous works of Fritz Reuter has been begun in Germany, and the first volume is accompanied by a very sympathetic biography of him by the editor, Adolph Wilhelm. With the full consent of the poet's widow, a frank account is given of his passion for drink (*Bräu-sucht*), which is rightly regarded as a disease for which there was after it had once been contracted no moral responsibility whatever. In the beginning Reuter drank hard in order to forget his misery as a political prisoner in Prussia's clutches, and when after seven years (he had been condemned for thirty) his deliverance came, he carried into private life this pathological craving which must be satisfied, which ran its course like a fever, and from which his wonderful constitution rallied invariably with renewed vigor. But the habit nearly made a wreck of him. He wanted to become a painter, in opposition to his father's wish, who sent him back to the University to study law. Here the temptation to give was too much for him, and he next devoted himself to farming, with indifferent success, owing his support by teaching. In this career he gained the friendship of a Prussian landowner, to whose confidence in him and shrewd knowledge of human nature Reuter owed the fortunate marriage which rescued him from an obscure and perhaps melancholy fate. This friend, knowing Reuter's bent, to be troubled with scruples about the match, dared to lead her where he lay under the influence of one of his attacks. The result justified his calculations. She resolved to undertake the saving of a life; and though she failed, as other treating wives had done before her, to destroy her husband's appetite for drink, she had the rare consolation of seeing neither his constitution nor his morals undermined by it. The wedding took place in 1850, and Reuter died only last July, of heart disease. At least as early as 1869, however, his power as a writer had reached their climax. The history of Mecklenburg, which he left unfinished and which now appears in print for the first time, dates from 1859-62, and is pronounced not inferior to his best work. It is a singular circumstance that the dialect which contributed so much to his fame was not originally so spontaneously employed by him. His earliest writings were in High German, including his masterpiece (1847), which was afterwards put into Plattdeutsch with the title "Ulmus Strouid." The example which he followed so profitably at last was set him by Klaus Groth, whose "Quikdorn" appeared in 1852. The drollery which characterizes Reuter's works found early acceptance with the Mecklenburgers, who are never weary of hearing and telling humorous stories; and Reuter not only had a great store of these but told them exceedingly well before he ever put pen to paper.

PROFESSOR MASSON'S ESSAYS.*

WE always read Professor Masson with interest, but never without a certain feeling of disappointment. He is clear, shrewd, and vigorous, and his style (when it is not Mr. Carlyle's) is quite his own. He attempts to deal with subjects in a first-rate manner, and yet, at the last, he fails to give an impression of first-rate power. He is, in a word, in thought and expression the least bit vulgar. He is fond of rhetoric, which is perfectly legitimate; but his taste has old habits. He writes literary history in the picturesque manner; but it is amusing to have a writer of his apparent sincerity recommending as of Mr. Heyworth Dixon. When Chatterton, in the author's biography of the young poet, writes to Horace Walpole, we are told that "whether from the selfishness and selfish of the attack, or from the stupefying effects of the warm air in his library of a Scotch country, Walpole was completely taken in." Dryden made an attack on Elizabeth Selkirk, the bad poet. "Selkirk," says Professor Masson, "replied with some spirit,

* Speculative philosophy is properly metaphysical, and proceeds deductively from axioms, like Plato's or Kant's, or Mr. Spencer's later form of a *præsumptio* which he believes to be founded, in part, on the empirical facts of heredity, and thus give it a scientific basis.

* These Devils: Luther's, Milton's, and Goethe's. With other Essays. By David Masson, M.A., LL.D., &c. London and New York: Macmillan & Co., 1884, 2