

MISCELLANEOUS.

LEONHARD EULER.

Leonhard Euler, one of the greatest and most prolific mathematicians that ever graced the annals of science, was born at Basle, Switzerland, on the 15th of April, 1707. His life fell thus in the period just succeeding the invention of the Calculus by Newton and Leibnitz, the period of the greatest glory of mathematics, which was destined through his hands to be pushed to an unparalleled pitch of perfection. Perhaps the life of no man offers an example of such long and unremitting creative production, nor any science so great a single legacy as that bequeathed by this God-graced inquirer. He fell short of his great compeer and successor Lagrange in the elegance, generality, and high abstractedness of his results, but certainly not in the magnificent plenitude of his achievements.

Euler showed early his mathematical bent. He received in his youth at Basle the instruction of the greatest living mathematician of Europe, John Bernoulli, and at nineteen competed for a prize offered by the French Academy on the masting of ships, which was taken by the veteran hydrographer M. Bouguer, Euler receiving second honors. In 1733, when twenty-six years old, he succeeded his great friend Daniel Bernoulli as professor of mathematics at the Academy of St. Petersburg. His productiveness was astounding, and in a few years his reputation was one of the highest in Europe. There was no branch of existing mathematics that he left unaugmented, and few branches of analysis that arose in the years succeeding his death that he did not partly lay the foundations of. Mechanics, astronomy, music, navigation, gunnery, optics received his attention equally with the purely theoretical parts of arithmetic, algebra, analytical geometry, the Integral Calculus, the Isoperimetrical Problems, etc. He labored incessantly. His very recreations were mathematical, and to them we owe the origin and solution of many important problems. Here fall, for instance, the knight's move in chess and the problem of the crossing of the Königsberg bridges, which gave rise to the "geometry of situation." In consequence of his unceasing application he lost in 1735 the sight of his right eye, and in 1766 that of his left. Thereafter he was compelled to use an amanuensis, but his productivity continued unabated. By virtue of his tenacious memory he was able to carry on the most complicated calculations in his head, and it is related of him that he once formed a table of the first six powers of all numbers from 1 to 100 and recollected them ever afterward with perfect accuracy. He could repeat the *Æneid* from beginning to end and remember the place of every line on every page.

In 1741 he was called to Berlin by Frederick the Great, but returned in 1766

to St. Petersburg where he worked till his death. He left enough posthumous MSS. to supply memoirs for the *Acta Petropolitana* for twenty years after his death, and it is said his complete works would fill from sixty to eighty quarto volumes.

But Euler was not only an investigator; he was also an unusually gifted expositor and teacher, such as few great inquirers have been. Even his works of discovery were frequently systematic didactic treatises, as witness his "Introduction to the Infinitesimal Calculus" wherein he incorporated researches revolutionising analytical mathematics and which in its first part, as recently published in a German translation by Springer of Berlin, can be read with profit and satisfaction to-day. Mention must also be made of his *Introduction to Algebra*—the only instance of an elementary text-book, if we except the lectures of his successors Lagrange and Laplace, ever written by a mathematician of really first creative rank. It is clear, simple, and copious in style, so much so that it can be used by beginners without the least aid from a teacher; its occasional shortcomings¹ being plain and self-apparent to the intelligent reader. This book, the translation of which is rare in English, can be had in the original, perspicuous German for a mere pittance (Reclam: Leipsic), and might profitably be used in the teaching of scientific German in our colleges as an easy and familiar introduction to the language of German mathematics.

Euler's signal fault in thought and exposition was his diffuseness which formed so marked a contrast to the elegant conciseness of Lagrange. It is said that this was due to the same elements which created in him his theological bias. His father was a preacher. He was himself pious, and a rigid Calvinist, often battling manfully for his faith. With Newton, with Pascal, and so many others of the inquirers of the century preceding him, he offers a most conspicuous example of the two warring elements of religion and science standing side by side in one and the same head unreconciled, each triumphant and victorious in its field. He busied himself much with religious and philosophical problems, as his famous *Letters to a German Princess* (1760-1762) show, wrestling with the problems of evil and prayer, foreknowledge and freedom, preferring "the divine truth to the reveries of men" and the pride of unyielding philosophers. We give but one example, his apology for prayer. He says:

"I remark, first, that when God established the course of the universe, and "arranged all the events which must come to pass in it, he paid attention to all the "circumstances which should accompany each event; and particularly to the dis- "positions, to the desires, and prayers of every intelligent being; and that the "arrangement of all events was disposed in perfect harmony with all these circum- "stances. When, therefore, a man addresses to God a prayer worthy of being "heard, it must not be imagined that such a prayer came not to the knowledge of "God till the moment it was formed. That prayer was already heard from all "eternity; and if the Father of Mercies deemed it worthy of being answered, he "arranged the world expressly in favor of that prayer, so that the accomplishment "should be a consequence of the natural course of events. It is thus that God "answers the prayers of men without working a miracle."

The philosopher here unconsciously employs the atheistic weapon of Deism in support of his Christian faith, and gives proof that if he could not escape his an-

¹For instance, in the elementary treatment of infinite series, where it is said that $\frac{1}{2} = 1 - 1 + 1 - 1 + 1$ etc. *ad infinitum*, because since we are not allowed to stop at any member neither 1 nor 0 can be the result, but something between these two, which is $\frac{1}{2}$!

cestral theologic bias, he could also not resist the spirit of the age, which had imperceptibly infiltrated his religious thought.

Euler was gentle, simple, and unaffected in character, and distinguished by an exemplary love for his numerous family. His single and unselfish devotion to the truth, his joy at the discoveries of science, which was as sincere when these discoveries were made by others as by himself, is beautifully evidenced in his letter to the youthful Lagrange when the latter generalised the branch afterwards known as the Calculus of Variations: "Your analytical solution of the isoperimetrical "problem," he writes, "leaves nothing to be desired in this department of inquiry, "and I am delighted beyond measure that it has been your lot to carry to the "highest pitch of perfection a theory which I have been almost the only one to "cultivate since its inception."

Euler died in St. Petersburg in 1783 crowned with the emoluments and distinctions of a princely scientific career which he never forsook for the allurements of the world. In the Academy of the city which had witnessed most of his silent triumphs was placed an allegorical picture representing Geometry standing upon a basement covered with mathematical calculations—the formulæ of his theory of lunar motions.

T. J. McCORMACK.

THE SACRED BOOKS OF THE BUDDHISTS.

AN OPEN LETTER TO THE KING OF SIAM.

SIRE: In the spring of 1896, I learnt from the *Journal of the American Oriental Society* that you had presented forty copies of the Buddhist Scriptures in Pâli to the libraries of the United States. A list of the favored libraries was given, and I found that two copies were in the city where I reside. Though I have been a librarian since 1881, and was in the habit of using both these libraries, I was not aware that they had received so royal a present; for our newspapers, which recorded the fact, contain daily more than any one could read in a week; so that it is not astonishing when we miss information therein. As I was already a student of Pâli, and had spent much money in buying Pâli Texts in Roman letters, I was anxious to make use of your edition, because I knew it contained books which are not to be had in Roman letters, and which have never been printed before in the history of the world, except in translations by that nation who invented printing some eight hundred years before we did—I mean your neighbors the Chinese. But your volumes were in the canonical Pâli, an Aryan language closely allied to Sanskrit, and containing words like *pità*, father, and *mâtâ*, mother, which we recognise at once to belong to our own European family. I was also pleased at Your Majesty's critical ability in omitting from your edition of the Scriptures those ancient fairy-tales called Birth-Stories, which we know were disputed at the Second Council of the Order in the fourth century before Christ. These books are therefore on the same footing with certain books in the New Testament, which we Christians call *Antilegomena*, that is, disputed by the ancients, such as the Second Epistle of Peter, together with six others.

Upon my asking at the library, the thirty-nine volumes, bound in yellow, the ancient color of the Buddhist robe, were placed before me. The first thing I had to do was to master the Siamese alphabet, for I had only read Pâli in Roman letters. I therefore borrowed a volume from the library, and, by the aid of your valuable and necessary table of transliteration at the beginning, I soon learnt to read

and write the simple and elegant characters which your scholars have devised. Our own letters are barbarous in comparison, and this for the reason that we have borrowed those of the Romans, without adding to them such newly invented ones as are absolutely necessary to express our greater number of sounds. You Asiatics have a much more scientific idea of constructing an alphabet than we have, and therefore you take care to have one letter for every sound, that there be no confusion. The Armenians invented their alphabet on this rational principle in the fourth century, and it is evident that you have done the same in Siam when adapting Siamese letters to Pâli. You had not enough in your Siamese alphabet; so you invented new ones,—all very elegant and shapely,—until you had enough for every sound in Pâli. If the English and the Americans would only do the same, "our commercial and conquering tongue," as Emerson calls it, would be a still greater conqueror. As it is, its absurd orthography acts as a barrier to foreigners, second only in difficulty to the ideographic systems of the Chinese and the ancient Babylonians and Egyptians.

I have since derived much spiritual profit and intellectual enjoyment from the use of your gift, especially from Vol. 25. This is because the Dhammapada and the Sutta Nipâta are out of print in the Roman letters, and are not to be had by an ordinary student. I have copied out many pages from these grand old books, turning your characters into Roman letters as I do so. Not only so, but I know many verses in both these collections by heart, and their rich music rings through my head day and night. I have read portions of Homer, Virgil, and Horace in the originals, but neither hexameter, Sapphic, nor alcaic is one whit the richer in musical effect than the varied measures of these ancient poems. The softness of the language rivals Italian; and when one begins the Dhammapada, one launches upon a sea of melody:

"Mano pubbamgamâ dhammâ,
[Character has its mainspring in the mind.]

Of the fifty ways in which we may translate these immortal words, none can ever have the music of the Pâli.

Christian as I am, and believing that the Lord Jesus was the Deity in person, I can yet admire what is true, and therefore Divine, in your religion. The great fact which Gotama has taught us is that our present personality is not worth preserving. It is a husk, a scaffolding, whose beginning is in the world of sense and flesh, and which, after forming a basis for a higher development in realms unknown, is fit only for extinction. "Blessed shall be the cessation thereof." Though this doctrine finds full expression in our own New Testament, yet it is in the rapture of Hebrew gnomes; while in your Three Baskets, especially in the Second, it is elucidated with an intellectual clearness which we cannot find in the concentrated utterances of our Divine Master. Your generosity has given our nation the opportunity of learning all this from the fountain-head.

I now come to the real object of my letter: to thank Your Majesty for the treat you have given me. You have already received the thanks of universities, of libraries, and of famous scholars. I wish you now to accept the thanks of an obscure and unknown student, that you may feel assured of having done a benefit beyond what you have already been thanked for.

I therefore subscribe myself,

Gratefully yours,

ALBERT J. EDMUNDS.

HISTORICAL SOCIETY OF PENNSYLVANIA, May²⁷, 1897.

BRIEF NOTES ON SOME RECENT FRENCH PHILOSOPHICAL WORKS.

We may fitly preface our remarks on the main philosophical works which have appeared in France during the last year with a mention of the *Année Philosophique*¹ which is published under the able editorship of M. F. Pillon and has for its task the review of everything in French philosophy for the year 1896. The *Année* is now in its seventh year, and its possession is indispensable for those who would survey within a brief compass the annual course of Gallic thought. The original articles are contributed by M. Renouvier who writes on "The Categories of Reason and the Metaphysics of the Absolute," F. Pillon who discusses "The Evolution of Idealism in the Eighteenth Century," and L. Dauriac who offers a criticism of the doctrines and methods of Lachelier. Particularly the essay of M. Renouvier is distinguished for the clearness with which it treats a difficult subject, while that of M. Pillon is remarkable for the philosophic culture which it discovers. The bibliography also is the work of M. Pillon, who was the editor of the old *Critique Philosophique*, a philosophical magazine of high worth and standing.

We have a very useful treatise in M. PAUL RENAUD'S *Précis de logique évolutionniste. L'entendement dans ses rapports avec le langage*,² which aims to present the elements of natural logic in a concise and simple form, by the use of the material and data which the modern science of language offers. M. Regnaud, who is Professor of Sanskrit and Comparative Grammar in the University of Lyons, and is hence eminently fitted for such a task, regards language as the living record of the development of thought in the past and consequently as the principal document to be studied in treating the evolutionary psychology of the race. His readers will find his reflexions simple and suggestive.

We have in *Le Psychisme Social*³ of M. E. DE ROBERTY a work of a different type. M. de Roberty is Professor in the new University of Brussels, which by its high and liberal aims and its recently broadened plan of instruction is one of the most exemplary educational institutions in the world. He is the author of a systematic series of philosophical works which when completed will cover the whole ground of philosophic inquiry, and which began with his *Sociology*, was continued with one or two historical works, with formal discussions of the reigning movements in philosophy, and is now engaged with the subject of ethics. Ethics will be treated in three volumes of which the present is the second. Ethics, according to M. de Roberty, is explained by the bio-sociological development, which is predominantly intellectual in character and significance. He regards social life as beginning with ideation and constituting thus an absolutely new power in the universe; hence the name *social psychism*. M. Roberty is a hard and profound thinker, and for a foreigner his works are not all easy reading.

Under the pseudonym of Jules Rig, M. ÉMILE RIGOLAGE embarked as early as 1876 upon the praiseworthy task of epitomising Comte's *Course of Positive Philosophy*. The work met with some favor and was translated into various languages. It was well done and could be relied upon, and M. Rigolage had made it possible for one to get the gist of Comte's philosophy without reading everything he had written. He now publishes the second volume of his *résumé* in a second edition, under the title of *La sociologie*,⁴ which, inasmuch as the first part was the *résumé*

¹ Felix Alcan, publisher. Price, fr. 5.

² Felix Alcan, publisher. Price, fr. 2.50.

³ Felix Alcan, publisher. Price, fr. 2.50.

⁴ Felix Alcan, publisher. Price, fr. 7.50.

of Comte's survey of the state of science in his time and is now of course antiquated, really gives his philosophy proper. M. Rigolage has added a valuable preface to his book, where he treats of the application of the positive philosophy to education which had not been considered by Comte.

In the "Historical Collection of the Great Philosophers" which Alcan is publishing in Paris and which now contains excellent translations of Aristotle, Leibnitz, Kant, Fichte, Hegel, etc., besides large critical works on Socrates, Plato, Marcus Aurelius, Malebranche, Maine de Biran, etc., M. Victor Basch has now given us a ponderous work of 622 large octavo pages entitled *Essai critique sur l'esthétique de Kant*.¹ The work is certainly exhaustive, and M. Basch has subjected the Kantian æsthetics to a microscopic and severe examination in the light of contemporary psychology, endeavoring to draw profit from it for modern uses. He reviews Kant's method, his theories of feeling, of logical and æsthetical reflective judgment, of the æsthetic sense itself, etc., etc. He proposes to study in a sequel to this work the æsthetic of Kant in its historical development, origins, and results. As, judging from its scope, that volume is likely to be larger than the present one, M. Basch will certainly have said much upon this subject. We gladly call attention to this series of works, as the translations and criticisms have been made and written by men of the stamp of Barthélemy Saint Hilaire, M. Fouillet, and M. Paul Janet.

The most recent of the sociological works of ÉMILE DURKHEIM, Professor of Sociology in the University of Bordeaux, is his treatise on *Suicide*,² which he studies as a social phenomenon, observing that every nation has a penchant for suicide of a definite intensity measured by the ratio between the annual number of cases and the population, which the author calls the social rate of suicidal mortality. To seek the conditions which cause this rate to vary is the object of his work. He also considers the means by which the enormous increase in the number of suicides in all large European countries can be retarded. The work is accompanied with numerous charts and tables of statistics.

In *Les origines du socialisme d'état en Allemagne* M. CHARLES ANDLER, Lecturer at the École normale, reviews the causes which have led to the establishment in Germany of a socialistic monarchy, one of the most significant and curious developments of modern government and society. He finds that this development has its cause in the intellectual ferment which was brought about by the great and powerful philosophical works of Hegel, Savigny, Ferdinand Lassalle, and Rodbertus. A noteworthy feature of the book is the author's insistence on the power of ideas over facts. He studies the fundamental conditions of the ownership of property, of the production and distribution of wealth, of the organisation of social labor, the question of revenue and wages generally. He lays much weight upon the influence exerted by the early German philosophers, and shows that they were more concerned with the relations which the individual holds to the state than the relations which individuals hold to each other. Thence proceeded the ideas which led in Germany to state socialism,

We have further to refer to a book on *Nature et moralité*¹ by Charles Chabot, wherein the author discusses the question of free-will, the content of morality, etc., while we must also not omit to mention a work in two volumes by M. J. Strada which has the same title as that of the task to which *The Open Court* is devoted, namely *The Religion of Science*.⁴ M. Strada understands by "religion of science"

¹Fel can, publisher. Price, fr. 10.
³F can, publisher. Price, fr. 5.

²Felix Alcan, publisher. Price, fr. 7.50.
⁴Two volumes. Alcan. Price, 7 fr. each.

something similar to the meaning given to it by *The Open Court*, insisting upon an impersonal criterion of truth which he finds in the Fact, identifying the basis of religion with science, etc. We may have occasion to return to this work independently later. It is difficult reading and extremely rugged in style.

Mention should finally be made of the excellent work which *La Revue Philosophique*¹ under the editorship of M. Ribot, and the *Revue de Métaphysique et de Morale*,² under that of M. Xavier Léon, are doing. The former review is devoted mainly to psychology and to the related philosophical questions, while the review of M. Léon is concerned with the more formal problems which compose the science of metaphysics in its best sense. Its contributors are eminent thinkers in all departments. Science is especially considered, and in every number a certain amount of space is devoted to the consideration of practical questions, it being a theory of the editor that the power of philosophy also belongs to life. T. J. McC.

BOOK REVIEWS AND NOTES.

AN OUTLINE INTRODUCTORY TO KANT'S "CRITIQUE OF PURE REASON." By R. M. Wenley, Professor of Philosophy in the University of Michigan. New York: Henry Holt & Co. 1897.

Prof. R. M. Wenley of the University of Michigan with his publishers, Messrs. Henry Holt & Co. of New York, have made a laudable experiment in the publication of this *Outline Introductory to Kant's Critique of Pure Reason*. The little book, which is only ninety-five pages in length, is written in a concise, lively style and gives a very adequate digest of Kant's monumental and epoch-making work. Professor Wenley has supplied an able introduction on the genesis of the *Critique of Pure Reason* showing its connexion with the preceding development of philosophy, and he has evinced throughout the whole of his opuscle a clear grasp of the main trend and significance of Kant's thought. The little book might be read before or collaterally with the Prolegomena, a study of which should always be made introductory to that of the Critique itself. If the present work is favorably received by teachers and students, it is the intention of the author and publisher to issue a series of works of like character, giving digests of the other leading philosophical masterpieces, to which end the services of prominent teachers in America and Great Britain are to be enlisted. Such a general conspectus as Professor Wenley has given is in Kant's case perhaps more necessary than in that of any other philosopher. But the outcome of each attempt must be judged upon its own merits. We can cordially recommend the present little book and would certainly encourage the author and publisher to continue their plan. T. J. McC.

A MATHEMATICAL SOLUTION BOOK CONTAINING SYSTEMATIC SOLUTIONS TO MANY OF THE MOST DIFFICULT PROBLEMS. With Notes and Explanations. By B. F. Finkel. Kibler, Cokely & Co.: Kidder, Mo. Pages, 352.

Prof. B. F. Finkel has supplied a useful work in his *Mathematical Solution Book*. His purpose has been to give systematic as opposed to routine solutions of the commonest difficult problems of elementary mathematics, and he has searched all the leading works and periodical literature on the subject for the material which he has offered, not omitting the contributions which he has himself made to the art of solving mathematical problems. All the operations of elementary arithmetic

¹Felix Alcan, publisher. Price, 33 fr. per annum.

²Armand Colin & Cie., publisher. Price, 15 fr. a year.