

MISCELLANEOUS.

PIERRE SIMON DE LAPLACE.

In Laplace we come upon a type of man who both in scientific and in human character diverges widely from the ideal which our imagination moulded from the life and achievements of Lagrange. (See the December *Open Court*.) As to science, we saw that the characteristic trend of Lagrange's mind was the attaining of the utmost generality in mathematics, the acquiring of a perfect mastery over the quantitative relations of the world, and that he realised this bent of his genius in the most consummate and elegant manner conceivable. He rarely stopped—in fact never thought it necessary to stop—to unravel the detailed consequences of the magnificent general mechanisms which he wrought, conscious that such developments were a matter of course and required but time and the plodding industry of minds of a routine type only. In her excellent biography of Lagrange in the *Encyclopædia Britannica* Miss Clarke, in drawing a parallel between the two mathematicians, says:

“In analytical invention, and mastery over the calculus, the Turin mathematician was admittedly unrivalled. Laplace owned that he had despaired of effecting the integration of the differential equations relative to secular inequalities until Lagrange showed him the way. On the other hand, Laplace unquestionably surpassed his rival in practical sagacity, and the intuition of physical truth. Lagrange saw in the problems of nature so many occasions for analytical triumphs; Laplace regarded analytical triumphs as the means of solving the problems of nature.”

And in another place we read that Laplace showed his practical bent by stating very important conclusions and making very important discoveries which were directly contained in the creations of Lagrange, and which needed but a few turns of the formal machinery invented by the latter, for their production. It is evident, however, that the inventor, say, of a rubber machine or a paper machine cannot justly be criticised for his lack of insight into the things of the world by not making paper or rubber with the machine which he has invented. The two provinces of activity are entirely different provinces. The man who has done the first has virtually done the last, and it would be a grievous loss to humanity were he to stop in his high career to do what less skilful hands and brains could accomplish. Or, to use another simile, which has been applied by an eminent German philosopher, Eugen Dühring, the royal eagle in his flight and with his broad view of the earth below misses many a petty object which the grovelling worm stumbles upon by his very lack of celestial powers. And while in view of the magnificent achievements of Laplace which have made him one of the first names in scientific history, it would be absurd to apply so exaggerated and belittling a comparison to him,

Düring's remark is yet pregnant with truth and is deserving at least of notice in drawing a parallel between these two giants of the intellectual world. We shall, therefore, in emphasising this scientific trait of Laplace's mind as compared with Lagrange, cite the judgment of a more impartial critic, De Morgan, who incidentally brings out certain grave human failings of our hero, which we must not omit to emphasise:

"In that part of the *Mécanique Céleste*," says De Morgan, "in which he [Laplace] revels in the results of Lagrange, there is no mention of the name of the latter. The reader who has studied the works of preceding writers will find him, in the *Théorie des Probabilités*, anticipated by De Moivre, James Bernoulli, etc., on certain points. But there is not a hint that any one had previously given those results from which perhaps his sagacity led him to his own more general method. The reader of the *Mécanique Céleste* will find that, for anything he can see to the contrary, Euler, Clairaut, D'Alembert, and above all Lagrange, need never have existed. The reader of the *Système du Monde* finds Laplace referring to himself in almost every page, while now and then, perhaps not twenty times in all, his predecessors in theory are mentioned with a scanty reference to what they have done; while the names of observers, between whom and himself there could be no rivalry, occur in many places. To such an absurd pitch is this suppression carried, that even Taylor's name is not mentioned in connexion with his celebrated theorem; but Laplace gravely informs his readers, *Nous donnerons quelques théorèmes généraux qui nous seront utiles dans la suite*, those general theorems being known all over Europe by the name of Maclaurin, Taylor, and Lagrange. And even in his *Theory of Probabilities* Lagrange's theorem is only '*la formule (p) du numéro 21 du second livre de la Mécanique Céleste*.' . . . The consequence is, that a student who has followed the writings of Laplace with that admiration which they must command, is staggered when he comes afterwards to find that in almost every part of the work here are important steps which do not belong to Laplace at all. He is then apt to imagine that when he reads more extensively he shall find himself obliged to restore more and more to the right owner, until nothing is left which can make a reputation such as is that of Laplace with the world at large. Such an impression would be wholly incorrect; but it would be no more than the just reward of the practice of suppression. Nevertheless, the researches on the figure of the planets in the *Mécanique Céleste* and the general method of the *Théorie des Probabilités* for the approximation to the value of definite integrals, are alone sufficient, when all needful restoration has been made, to enable us to say, that Laplace was one of the greatest of mathematicians."

And, to cite Miss Clerke again: "Between him and Legendre there was a "feeling of 'more than coldness,' owing to his appropriation, with scant acknowledgment, of the fruits of the other's labours; and our celebrated countryman, "Dr. Thomas Young, counted himself, rightly or wrongly, amongst the number of "those similarly aggrieved by him." But with Lagrange, who never obtruded his personality into the creations of his intellect, and from whom Laplace drew most, the latter is said to have "always remained on the best of terms."

Pierre Simon de Laplace, Marquis, and peer of France, one of the immortal forty of the French Academy, Member of the Academy of Sciences, and of the *Bureau des Longitudes*, Associate of all the great scientific societies of Europe, was born at Beaumont-en-Auge near Honfleur, on the 28th of March, 1749; he died March 5th, 1827. He early taught mathematics, and at eighteen years of age was already in the French capital with letters of introduction to D'Alembert. D'Alembert's recommendation procured for him a Chair of Mathematics in the military school of Paris, and in a few years the brilliant scientific career began which was to place him in the front rank of European mathematicians and to make his reputation with the world at large almost equal to that of Newton. With his great genius, however, he possessed, as we have already noted, not a little personal vanity and an overweening desire for the distinctions of the world. It was in harmony, therefore, with his ambitions that in 1799 the First Consul made him Minister of the Interior. But he failed ignominiously in his political career; in six weeks General Bonaparte was surfeited with his exploits. "A mathematician of

the highest rank," said Napoleon, "he lost not a moment in showing himself below mediocrity as a minister. In his first attempt at business the consuls saw that they had made a mistake. Laplace looked at no question in its true point of view. He was always searching after subtleties; all his ideas were problems, and he carried the spirit of the infinitesimal calculus into the management of business." Of Laplace's subserviency, of his flattering dedication of his treatise on the Calculus of Probabilities to Napoleon, which on the Emperor's fall he ungratefully withdrew, the whole world knows. And with this we leave the dark side of his character.

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It will be interesting in this connexion to note the attitude of the great war-god of the nineteenth century to mathematics, or, for that matter, to science generally—Napoleon, who was interested in everything and who had, wrong or right, emphatic ideas on everything. To this megaloccephalic sprig of humanity it never occurred that he could not also have achieved the greatest things in science, as he had done in human slaughter, had he only seen fit, in the phrase of Newton, to "intend" his mind to the task. The presentation of one of Laplace's works gave him "occasion," he writes, "for regretting that *the force of circumstances* had directed him into a career which *removed* him from the pursuit of science." And not the least amusing feature is that Napoleon, who is known to have had a great addiction to the practical parts, at least, of mathematics, so far examined the first volume of Laplace's work, and so far appreciated the difficulties of its comprehension as to say: "The first *six months* which I shall have at my disposal will be employed in reading your beautiful work." Doubtless those six months of leisure were never granted to the science-thirsting man, for he was then only a common general. Afterwards, as Emperor, he wrote:

"There was a time when I should have read with interest your *Traité du Calcul des Probabilités*. For the present I must confine myself to expressing to you the satisfaction which I experience every time that I see you give to the world new books which serve to improve and extend the most important of the sciences, and contribute to the glory of the nation. The advancement and improvement of mathematical science are connected with the prosperity of the state."

And let us quote here a passage from the gossipy Arago, that "scientific comedian" of his day, as he has been termed,—a passage thoroughly characteristic of the Gargantuan egoism of the little Corsican, who even at a time when France intellectually overshadowed the world strutted among its greatest men as a Divine arbiter, dispensing his judgment and favors.

"The members of the Institute," says Arago, "were always presented to the Emperor after he had confirmed their nominations. On the appointed day, in company with the presidents, with the secretaries of the four classes, and with the academicians who had special publications to offer to the Chief of the State, they assembled in one of the *salons* of the Tuileries. When the Emperor returned from mass, he held a kind of review of these *savants*, these artists, these literary men, in green uniform.

"I must own that the spectacle which I witnessed on the day of my presentation did not edify me. I even experienced real displeasure in seeing the anxiety evinced by members of the Institute to be noticed.

"'You are very young,' said Napoleon to me on coming near me; and without waiting for a flattering reply, which it would not have been difficult to find, he added,—'What is your name?' And my neighbor on the right, not leaving me time to answer the simple question just addressed to me, hastened to say,—

"'His name is Arago.'

"'What science do you cultivate?'

"My neighbor on the left immediately replied,—

"'He cultivates astronomy.'

"'What have you done?'

"My neighbor on the right, jealous of my left-hand neighbor for having encroached on his rights at the second question, now hastened to reply, and said,—

"He has just been measuring the line of the meridian in Spain."

"The Emperor, imagining doubtless that he had before him either a dumb man or an imbecile, passed on to another member of the Institute. This one was not a novice, but a naturalist well known through his beautiful and important discoveries; it was M. Lamarck. The old man presented a book to Napoleon.

"What is that?" said the latter, 'it is your absurd *meteorology*, in which you rival Matthieu Laensberg. It is this 'annuaire' which dishonors your old age. Do something in natural history, and I should receive your productions with pleasure. As to this volume, I only take it in consideration of your white hair. Here!' And he passed the book to an aide-de-camp.

"Poor M. Lamarck, who at the end of each sharp and insulting sentence of the Emperor tried in vain to say, 'It is a work on natural history which I present to you,' was weak enough to fall into tears."

That work was the *Philosophie Zoologique!* Arago mentions no title. But the year of publication corresponds with the date (1809).

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We may return, now, to the achievements which constitute the great glory of Laplace, and let us listen preferably to the words of another :

"We have spoken freely of the defects of Laplace's character, both political and scientific, and it is now our more pleasing task to say a few words on the *Mécanique Céleste*, as a whole. We might dwell upon the great discoveries, such as the long inequality of Saturn and Jupiter, the cause of the acceleration of the moon's mean motion, the explanation of the peculiarities in the motion of Jupiter's satellites, with a long train of similar achievements; but this, though the most common method of describing the character of a philosopher, is not the sort of description which should be given of the *Mécanique Céleste*. Its bulk is about two thousand quarto pages; and, owing to the omission of all the steps which a good mathematician may be relied on as able to supply, it would, if expanded to the extent in which Euler would have written the same matter, have probably reached ten thousand pages. If all this work had been collected by one man, even from the writings of others, we should have called him the Delambre of the theory of gravitation, and should have prized his writings for their extent, their faithful representation of the state of the science at a particular time, and the diligence displayed in the undertaking. When to the preceding, which is forgotten in the splendor of some of the results, we add that to Laplace is due the discovery of much, the development of more, and that by the employment of his own resources in a manner which takes all the originality and power of the investigator, and the arrangement and combination of the whole, we may begin to see how he has earned his fame." . . . "As a monument of mathematical genius applied to the celestial revolutions the *Mécanique Céleste* ranks second only to the *Principia* of Newton."

All in all, then, we are concerned, not with human frailty, but mainly with human greatness. The three glittering gems in the scientific diadem of Laplace, his *Mécanique Céleste*, his *Exposition du Système du Monde*, his *Théorie des Probabilités*,¹ remain, after all their mortal accretions, a κτήμα ἐς αἰῶνι for humanity, and justify his pretentious title of "the Newton of France." Professor James, in his latest book, has quoted the noble sentiment of a young American philosopher, the late Xenos Clarke, as to the tremendous responsibilities which weigh upon us who daily live our lives at the expense of the mortality of thousands and thousands of suffering dumb animals. But it behooves us also not to forget that in a like measure we are intellectually parasitic on the dead minds of the past, and that our mental being is in great part but an emanation, a perfumed artificial incense rising from the æonic funeral-piles of human intellects. And of these last, Laplace was not the least.

THOMAS J. McCORMACK.

¹ Laplace's complete works have been recently published in a magnificent fourteen-volume edition (Gauthier-Villars, Paris, 1867-1894). The *Mécanique Céleste* has been translated into English by an American, Nathaniel Bowditch.

IMMORTALITY.

Maestoso.

mf

1. The end of life is sure, But do not sigh:

Crescendo.

For deeds true, good, and pure For - ev - er - more en - dure,

Cantabile.

f They do not die. When bod - ies fall to dust *p* Our

Crescendo.

brains and hands shall rest, Our life's work yet will live, We

f *mf* *f* *Dim.* *Rit.*

need not grieve; Our life's work yet will live, We need not grieve.

Those do not live in vain
 Who leave behind
 A memory without stain
 Or the least humble gain
 Unto mankind.
 Make but one further step,
 Endeavor to build up
 Future humanity,
 And blessed are ye.

Life's every throb and thrill
 Of ages past
 Remains for good and ill
 A living presence still
 That aye will last.
 Our fathers are not dead,
 Their thoughts pulse in our head,
 Their sentiments warm our heart,
 Their souls ne'er part.

A struggle is our life,
 But death brings peace.
 Our labors in the strife,
 Our sorrows ever rife,
 Will only cease
 When all our vanities
 And life's inanities
 Are given with our last breath
 Over to Death.

The school of life is stern ;
 Toil is our lot.
 But those who aspire and learn
 Can make their souls etern,
 They tremble not.
 The life whose hours are prized
 Can be immortalised,
 Each soul can be renewed
 A power for good.

Though the end of life be sure,
 We do not sigh :
 For deeds true, good, and pure
 Forever more endure,
 They do not die.
 When bodies fall to dust
 The toilers will find rest,
 Their souls, howe'er, shall live,
 We do not grieve.

The hymn "Immortality" was written and set to music¹ for the purpose of supplying an appropriate choral such as could be sung in commemoration of those immortal dead who are not dead but continue in life as the living factors of its further evolution. Most of our funeral hymns are based upon a dualistic conception of life, and there is need of a new song to express the new faith of the Religion of Science which no longer believes but knows that there is an immortality of the soul, and that this immortality is not in a Utopian heaven, but takes place here in this world and in this life of ours. In other words: the kingdom of heaven is not in the sky, but within us, it is in the souls of men. The kingdom of heaven is spiritual, not material, not local. Heaven is in soul-life, and it is in the soul-life of mankind that we shall find the life to come in which we shall be preserved with all our peculiar idiosyncrasies in our personal identity. There is, accordingly, no need of regarding death with terror, and a funeral hymn should therefore not be gloomy, but triumphal and majestic, for it expresses the victory over death gained through the more enlightened vision of the problem in its solution.

It is a sad coincidence that while the author of this hymn was engaged in writing it and having it set to music, his mother in the old country passed away

¹The melody, which was composed by the author, has been arranged for four voices in the form as it stands now by Mr. Albert Prox, of New York City (231 West Seventieth Street), a musician well known in the musical circles of that city.

suddenly and unexpectedly, but peacefully and without having gone through the trials of a protracted illness. There is no one who exercised a greater influence upon the building up of his character than his mother, and to her he dedicates the above hymn, knowing that though she died, her soul lives, For, as George Eliot says, she has joined

"... the choir invisible
Of those immortal dead who live again
In minds made better by their presence : live
In pulses stirr'd to generosity,
In deeds of daring rectitude, in scorn
For miserable aims that end with self,
In thoughts sublime that pierce the night like stars,
And with their mild persistence urge man's search
To vaster issues.

"This is life to come,
Which martyr'd men have made more glorious
For us who strive to follow."

We conclude with the poet's prayer :

" May I reach
That purest heaven, be to other souls
The cup of strength in some great agony,
Enkindle generous ardor, feed pure love,
Beget the smiles that have no cruelty,
Be the sweet presence of a good diffus'd,
And in diffusion ever more intense !
So shall I join the choir invisible
Whose music is the gladness of the world."

P. C.

NOTES AND BOOK REVIEWS.

Great philosophers have set the example of applying the horded inspiration and culture of philosophic thought to the solution of the practical problems of every-day life, and we have in this line, to mention only a few efforts, the famous *Meditations* of Descartes, Fichte's *Vocation of Man*, and his *Addresses to the German People*. Much commendable activity in the same field has been exhibited, too, by modern professors of philosophy, at least by such as seek to do more than to reproduce mechanically in the brains of the present generation the thoughts which have been handed down to them by the old. We have in mind, here, two instances which have been brought to our notice by recent publications. Prof. RUDOLPH EUCKEN of Jena, by his profound and zealous researches into the ways of thought of the great intellectual leaders of mankind, and by his steady insistence upon the points of view which have significance and worth for conduct, has done much towards giving to the people a share of that salvation which springs from living over again the thoughts of the great creative minds of the world. As one of his studies we have to mention his recent earnest and far-seeing judgment upon "Spiritual Man at the Close of the Nineteenth Century," published as a philosophical meditation in the July, 1897, *Deutsche Rundschau*. It is creditable, too, that the leading magazine of a great nation should in these commercial days find space in its pages for matter which the world needs, not wants. . . . There has also recently come to our hands a brochure by Dr. JOHANNES REHMKE on *Present Culture in Its Relation to Philosophy* (Heilbronn : E. Salzer, 80 pp.), which is deserving of notice. Professor Rehmke has written an excellent brief history of philosophy and is the author of a large work on formal psychology, so that he has brought a good