

universe: we have here a 'conceptual' mind which would predict accurately all physical events. What the good Bishop Berkeley would think of this, we do not presume to say; the speculation is fascinating, even though, as Prof. Planck remarks, in order to accomplish such a notion we must subject ourselves to a severe restriction—we must forgo making the ideal mind the subject of a scientific investigation.

Although Prof. Planck's conviction, that the law of causality is, in spite of the difficulty of a general

proof or disproof, a valuable sign-post to guide us through the tangle of perceptions in which we live, shows the direction of his own sympathies, he does not suggest that the answer he had given to the question originally raised is more than a tentative one. But, tentative though the answer may be, the question has provoked a brilliant, thoughtful, and stimulating address, which will live long in the memories of those whose privilege it was to be present at the Guthrie Lecture for 1932.

Jérôme de Lalande, 1732-1807

THE absorbing interest felt by the general reader in the outstanding men and events of the French Revolutionary period is to a great extent experienced by the student of the lives and characters of the French men of science who laboured during that remarkable time. During the latter part of the eighteenth century Paris was the centre of amazing intellectual activities, which even the vicissitudes of the most perilous days could not quench, and which, after the worst dangers were past, were resumed with increased zest. Especially was this the case with scientific studies and instruction. Old institutions of which the very life had been threatened were reorganised, and beside them sprang into existence others destined quickly to rival in renown any that had gone before. To one or other of the many institutions belonged most of the eminent men of science of France, among whom were Laplace, Lagrange, Delambre, Monge, Haüy, Berthollet, Chaptal, Coulomb, Lacépède, Lamarck, and last but not least, the astronomer Lalande, the bicentenary of whose birth occurs this month.

Joseph Jérôme Lefrançais de Lalande was born at Bourg-en-Bresse in the department of Ain, on July 11, 1732, and died in Paris on April 4, 1807, in his seventy-fifth year. Never in need of labouring for his daily bread, his life was yet one of unceasing effort, and from the time when as a boy he came under the Jesuit schoolmasters at Lyons until old age came upon him, his industry was remarkable. It is true that as an astronomer he has never been reckoned in the first rank as a discoverer or an investigator, but as an exponent of astronomy and a populariser of science he has had few equals. His industry is attested by the list of more than two hundred memoirs and books he wrote, but much of his influence on the progress of astronomy was due to the lectures he gave during the forty-six years he held the chair of astronomy at the Collège de France and to his encouragement of students. Though no great discovery stands to his credit, by his writings and lectures he gained for his favourite science a popularity previously unknown, and it is for that he is chiefly remembered.

Lalande's interest in astronomy is said to have been aroused by seeing a comet and watching an eclipse, and to have been further stimulated by reading Fontenelle's "Plurality of Worlds". It was, however, his contact with Delisle and Lemonnier which led him to abandon the law courts for the observatory, and it was through Lemonnier that as a youth of nineteen years of age he was sent

to Berlin to make observations simultaneously with those being made at the Cape by Lacaille for determining the parallax of the moon. From the court of Frederick the Great and the society of Euler, Lalande returned to Paris and at the age of twenty-one was given a place as 'adjoint-astronome' in the Paris Academy of Science. He became an 'associé' in 1758 and a 'pensionnaire' in 1772.

With the account of his work at Berlin began the long series of memoirs referred to. A few years later, for Clairaut he made a mass of calculations in connexion with the predicted return of Halley's comet; in 1761 he succeeded Maraldi as editor of the "Connaissance des Temps"; in 1762 he succeeded to Delisle's chair at the Collège de France, and in 1764 he published the first part of his "Traité d'astronomie". Other parts followed in 1771 and 1792. "This compilation", wrote Thomas Young, "far excelled in utility all former works of the kind, and will always be considered as exhibiting the most perfect picture of the science such as it existed from 1760 to 1790 with all the details of practice and computation." Lemonnier called Lalande's work "the great newspaper of astronomy". Another notable work of Lalande was his "Histoire céleste", published in 1801, giving the places of 47,390 stars, the observations for which were made chiefly by his nephew Michel Lalande and D'Agelet, both of whom he had instructed.

The character of Lalande was no less interesting than his work. It was once said of him that he was as anxious to direct attention to himself as an individual as to astronomy as a science. His love of flattery and publicity was undeniable; but he possessed many admirable traits. Generous to a fault, he encouraged and provided for many young and needy students, and during the Revolution his courage led him to protect others at his own risk. He visited England in 1788, conversed with George III., crawled through Herschel's great telescope at Slough, and it was due to him that Herschel's newly discovered planet, Uranus, was for a time called after its famous discoverer. Living abstemiously himself, he placed his fortune at the disposal of others, and towards the end of his life founded the Lalande medal, which became the 'blue ribbon' of the astronomical world. Quite early in his career, in 1763, he was made a foreign member of the Royal Society, while the esteem in which his memory is still held in France was shown by the inauguration in 1909 of a monument to him at his birthplace, Bourg-en-Bresse.