Corporation representing the University for six years his services were much appreciated. Even after his retirement from official duties in 1919 at the age of 60 years Dr. Moos continued to take a keen interest in meteorological, magnetical and seismological problems. He was always alert and active till he entered rest on 12th March 1936 at the age of 77 years.

The writer of this article was associated with Dr. Moos and his work for 16 years from 1903 to 1919 and cherishes grateful memories of the very kind and paternal interest which he took in his staff in all matters connected with their welfare. He knows Dr. Moos as a fearless exponent of the views which he considered to be right and in the true interests of his beloved Observatory; he knows him also as a keen upholder of his views in his other educational and civic activities and above all as an ideal head of a family and of a working scientific institution.

RAO SAHEB M. V. UNAKAR.

Centenaries in June 1936.

Regiomontanus, Johann, 1436-1476.

JOHANNES MULLER, who is better known by his pseudonym Regiomontanus, was born at Konnigsberg, on June 6, 1436. According to the traditional estimate, Regiomontanus was for long regarded as "the most learned astronomer that Europe had yet produced". He was educated at Vienna. He received the Master's degree in 1457 and became a lecturer the very next year. He lectured on Euclid and on perspective geometry. He also colloborated with his teacher George Peurbach in correcting and revising the Alphonsine Tables.

ADOPTS THE HINDU IDEA OF *Sine*.

In 1462, Cardinal Bessarion persuaded him and his teacher to prepare a Latin translation of Ptolemy's *Almagest*. Peurbach died after translating the first six books and Regiomontanus completed the translation of the remaining seven books. This undertaking took him to Italy where he stayed for six years. While at Italy, he also wrote his Trigonometry entitled *De Triangulis*. This is said to be the earliest modern systematic exposition of trigonometry. He adopts, for the first time, the Hindu *Sine* in place of the Greek *chord of double the arc*. His oration at Padua on the history of mathematics is summarised by Cantor in his *Geschichte der Mathematik*. He is also said to have observed a total eclipse of the moon at Padua on April 2, 1464.

HALLEY'S COMET AND *Ephemerides*.

After being a professor in the University of Pressburg, which was established in 1467, he settled at Nurenburg in 1471, where he had for his pupil and patron a wealthy burgher, Bernhard Wattler, who built an observatory for him. Regiomontanus himself is said to have constructed the necessary instruments for this observatory. It is claimed that his observations of the great Comet of 1472, since called Halley's Comet, supplied the basis of the modern study of comets. His patron established a printing press, from which Regiomontanus issued a series of popular calendars. In 1474, his *Ephemerides* for 1474–1506 was published. This book explained the method of lunar distances for determinining the longitude at sea. Columbus is said to have used a copy of this.

HIS WRITINGS.

In 1475, Pope Sixtus IV invited him to Rome to reform the Calendar. He was made Bishop of Regensburg, but died at Rome on July 6, 1476, while still at the prime of his life. At his death, Regiomontanus left a long list of books, which he had already completed or was at work upon or intended to print for the first time. These included editions or new translations of various mathematical classics, such as the works of Ptolemy, Euclid, Apollonius, Hyginus and Theon. Astrological treatises also figure prominently in the list. Many of them were printed after his death, by his patron Wattler.

S. R. RANGANATHAN.

Coulomb, Charles Augustin, 1736-1806.

COULOMB, the French physicist, was born in Angouleme on June 14, 1736. He studied mathematics and science in Paris and then entered the army. After serving in the West Indies for seven years, he returned to Paris in 1776 and in the thirteen years which followed up to the outbreak of the great Revolution, he carried out his fundamental electric and magnetic investigations.

They brought him recognition and membership of the Academy.

COULOMB'S LAWS.

A good number of electrical and magnetic observations had accumulated for centuries and the additions made to this uncoordinated heap were remarkable during the century that preceded Coulomb. Various attempts had been made to obtain a general and comprehensive view of them and to discover the law of attraction between magnetic poles and between electric charges. But the credit of having enunciated them in exact terms goes to Coulomb. The laws of Coulomb are justly famous both for their simplicity and for the rare masterpiece of experimental skill, which formed their basis.

THE TORSION BALANCE.

The first step towards the discovery of his laws lay in the invention of the torsion balance in 1777. To improve the delicacy of this balance, he investigated the force of torsion and the elasticity of thin metallic and silk fabrics. He found the forces required to twist them to be proportional to the angle of twist, to the fourth power of the diameter of the fibre and to the reciprocal of the length of the fibre but to be independent of the load on the wire. This was published in 1784. With this result as the basis, Coulomb perfected his torsional balance to measure forces which were very small and fleeting. The torsion balance was later used by Cavendish in his important investigation of gravitation. The principle of this balance has since been used in a large number of finest measuring instruments such as galvanometers and electrometers.

HIS OTHER INVESTIGATIONS.

Coulomb was also active in other directions such as the laws of sliding friction and the internal friction of liquids. In the investigation of the latter, which he made in 1801, he made use of the torsional oscillations, executed by cylinders hung up in the liquid.

In 1789, at the outbreak of the Revolution Coulomb resigned all his official posts and retired to his small estate near Blois and devoted himself to scientific research. Napoleon, who had restored order, gave him back his former posts in which he worked devotedly until his death in Paris on August 13, 1806.

S. R. RANGANATHAN.

Ampere, Andre Marie, 1775-1836.

A. M. AMPERE, who was called the Newton of Electricity by Maxwell, was born in Lyons on January 22, 1775. He was brought up alone in the country and his education was got, with a little assistance from his father, mainly through books. He showed a wide range of mental activity and an extraordinary mathematical ability. The beheading of his father in 1793 filled him with apathy and for some time he wandered distracted and planless. His marriage at the age of twenty-four gave his life a definite direction again and he took up a teaching post near Lyons. His wife died within four years after their marriage and this event threw him again into a mood of life-long sadness.

FIRST WORK.

Ampere made his first appearance in the scientific world in a short work entitled *Considerations sur la Theorie Mathematique du Jew*, in which the question of the safety of habitual and indefinite play, either against a single person of greater fortune, or indifferently against any number of persons is discussed in a form full of warning to those by whom gambling is pursued as an occupation. This book brought him recognition and in 1809 he became Professor of Mathematics at the Ecole Polytechnique in Paris. Here he continued his scientific researches with great diligence and published memoirs on the integration of partial differential equations and on other subjects, which show a profound knowledge of some of the most refined and difficult artifices of analysis. The published papers of Ampere number fifty-five, of which three are joint papers.

FATHER OF THE SCIENCE OF ELECTRO-DYNAMICS.

Ampere's fame mainly rests on his memoirs on the mathematical theory of Electromagnetism, which are remarkable for the skill and ingenuity with which the powers of analysis are brought to bear on subjects apparently the most remote from their operation. Oersted's discovery, in 1820, of the magnetic properties of an electric current decided the direction in which Ampere's gift for scientific research was to develop. Only a few months later, on the

2nd October 1820, Ampere presented to the French Academy of Sciences a paper in which he showed that not only is there a mechanical force between an electric current and a magnet but that there is a mechanical force between two neighbouring electric circuits. This brilliant paper was followed by quite a number of others, in which various details were worked out.

CLARK MAXWELL'S ESTIMATE.

In the words of Clark Maxwell, the whole theory and experiment seems as if it had leaped full grown and full armed, from the brain of the "Newton of electricity". It is perfect in form, and unassailable in accuracy, and it is summed up in a formula from which all the phenomena may be deduced and which must always remain the cardinal formula of electro-dynamics. Ampere's memoirs are a splendid example of scientific style in the statement of a discovery.

HIS PERSONALITY.

Ampere died at Marseilles in June 1836. He was a man of great simplicity of character. He took no part in the cabals and jealousies which too frequently disturb the peace of the world of science. He was universally respected and beloved for his great integrity and the kindness of his affections. He retained a childlike disposition up to his old age. He was often tortured by doubts in small matters as well as great ones, so that life, in spite of all the recognition that it brought him, was by no means always satisfactory, a fact expressed in the epitaph chosen by himself *tandim felix*, *i.e.*, Happy At Last.

S. R. RANGANATHAN.

Award for Scientific Manuscript.

A CASH award of $1,000 is offered by the Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore, Md., for the best manuscript on a science subject, presented before July 1, 1937. The publishers put no limitations on the subject-matter or manner of handling, and none on eligibility for the award. The manuscript must be in English and "of a sort calculated to appeal to the taste of the public at large". The desired length is given as 100,000 words.

While any manuscript on a science subject will be considered, it is expected that the author will prove to be a man or woman engaged in a scientific pursuit and who is possessed of the requisite literary skill to interpret science for that portion of the public which reads books.

To assure authority, the publishers have enlisted the services of some 25 or 30 advisers—men of science of wide reputation and assured competence. One or more of these advisers will pass upon each manuscript from the viewpoint of soundness and accuracy. The award will lie in the joint discretion of four judges selected with a view to their especial qualification in choosing the sort of book that will appeal. These are: Joseph Wheeler, Librarian of the Pratt Library in Baltimore, and Chairman of the Book List Committee of the Association for the Advancement of Science; Harry Hansen, Reviewer and Critic for the *New York World-Telegram* and *Harpers Magazine*; Lyman Bryson, Professor of Education of Teachers College, Columbia University, and Director of the "Readability Laboratory"; and David Dietz, Science Editor of the Scripps-Howard newspapers.

Further details concerning the award may be had by addressing the publishers. (News Edition, *Ind. Eng. Chem.*, 1936, **28**, 195.)