Calendar of Scientific Pioneers.

November 10, 1832. Johann Gaspar Spurzheim died.—The disciple of and fellow-worker with Gall, the founder of cerebral physiology, Spurzheim studied medicine in Vienna, and with Gall published "Anatomie et Physiologie du Système nerveux en générale et du Cerveau en particulier."

November 10, 1852. Gideon Algernon Mantell died.—Especially successful in the discovery and description of fossils of the South Downs, Mantell was a surgeon by profession and practised at Lewes, Brighton, and Clapham. His collections are preserved in the British Museum and his drawings in Yale University.

November 12, 1793. Jean Sylvain Bailly died.—Originally intended for a painter, an acquaintance with Lacaille led Bailly into astronomical studies, and in 1763 he became a member of the Paris Academy of Sciences, establishing his reputation by a memoir on Jupiter's satellites. Later on he published a history of astronomy. A promoter of the French Revolution, the day of the storming of the Bastille, July 14, 1789, he was chosen mayor of Paris. His action at the Champs de Mars, July 17, 1791, lost him his popularity, and two years later he perished beneath the guillotine.

November 13, 1802. André Michaux died.—Acquiring a taste for botany from his father, Michaux studied under Jussieu, and travelled in Spain, Persia, and North America. He died at Madagascar while on a journey to Australia. The genus Michauxia is named after him.

November 14, 1716. Gottfried Wilhelm Leibniz died.—Born in Leipzig towards the end of the Thirty Years' War, Leibniz was the son of a professor of moral philosophy. During diplomatic missions to France and England he became acquainted with Huygens, Boyle, and Newton, and it was through Huygens he was led to study geometry. In 1676 he became librarian to the Hanoverian family, a post he held until his death. Equally eminent as a philosopher and a mathematician, he is recognised as one of the discoverers of the infinitesimal calculus, and the inventor of the accepted notation. The inauguration of the Berlin Academy of Sciences was due to him, and he became its first president.

November 15, 1630. Johann Kepler died.—Immortalised by his discovery of the laws of planetary motion, Kepler "may be said to have constructed the edifice of the universe." Taught astronomy at Tübingen by Maestlin, in 1593 he succeeded Stadt as professor of that subject at Gratz, and in 1600 joined Tycho Brahe at Prague, after Tycho's death becoming Court mathematician to the Emperor Rudolph II. From 1612 to 1629 he was at Linz, and the following year he died at Ratisbon. Applying the diverse talents of a singularly gifted mind to the study of Tycho's observations, Kepler in 1609 discovered the first two of the laws which bear his name, and in 1618 the third. His "Astronomia Nova" is among the classics of science. At his death his manuscripts were purchased by Hevelius, and are now preserved at Pulkowa observatory.

November 16, 1915. Raphael Meldola died.—For thirty years professor of chemistry at the Technical College, Finsbury, Meldola was especially known for his work on the chemistry of colouring matters. The friend of Darwin, he was also a naturalist, translated Weismann's "Theory of Descent," and was president of the Entomological Society. E. C. S.

Societies and Academies.

LONDON.

Royal Society, November 3.—Prof. C. S. Sherrington, president, in the chair.—T. R. **Merton**: The spectra of lead isotopes. Comparison of the wave-lengths of five lines in the spectra of ordinary lead and lead from Australian carnotite shows differences which are not constant, but vary for the different lines. The difference in wave-length observed for the principal line, $\lambda = 4058$ Å., is about two hundred times as great as that expected on theoretical grounds.—G. I. **Taylor**: Experiments with rotating fluids. Methods are described by which experiments on spheres, cylinders, and vortex rings moving through rotating fluids can be projected in a lantern and instantaneous photographs taken. If any small motion be given to a rotating fluid, the resulting flow will be such that concentrated masses of coloured liquid should be drawn out into thin films, parallel to the axis of rotation. Photographs taken by a camera placed vertically above a rotating basin of water show that the liquid moves in this way.—L. **Bairstow**, Miss B. M. **Cave**, and Miss E. D. **Lang**: The two-dimensional slow motion of viscous fluids. In its restricted form the equation of motion of a viscous fluid is $\nabla^4\psi = 0$, where ψ is Stokes's stream function. If the molecular rotation in the fluid be defined by $\xi \equiv \nabla^2\psi$, the equation of motion may be expressed alternatively as $\nabla^2\xi = 0$. The equation $\nabla^4\psi = 0$ is transformed by means of Green's theorem to a form in which the only unknown is the distribution of the ξ doublets on the boundaries. The strengths of the doublets are found by solving the resulting integral equation. An example shows the motion of fluid past a circular cylinder in an infinite parallel-walled channel. If d be the diameter of the cylinder, ρ the density of the fluid, ν the kinematic coefficient of viscosity, and U the velocity of the fluid in the centre of the channel at infinity, then, when the width of the channel is $5d$, the resistance per unit length of cylinder is $R = 7 \cdot 10 \rho \nu d U$. The value of Ud/ν to which this formula applies is not to exceed 0·2.—H. C. H. **Carpenter** and Constance **Elam**: The production of single crystals of aluminium and their tensile properties. The parallel portion of the test pieces of the sheet was 4 in. × 1 in. × 0·125 in., consisting of about 1,687,000. The conversion of this area into a single crystal involved heat treatment for six hours at 550° C., tensile stress of 2·4 tons per square inch, producing an average elongation of 1·6 per cent. on 3 in., and final heat treatment beginning at 450° and extending up to 600° C. On an average, one test piece in four produces a single crystal over its parallel portion, which frequently grows up into the shoulders of the test piece. The tenacity of single crystals varied from 2·8 to 4·08 tons per sq. in., while the extension on 3 in. varied from 34 to 86 per cent., according to the orientation of crystal relative to stress. Five types of specimens were recognised. Stress tests of test pieces consisting of two and three crystals show the strengthening influence of one crystal upon another. Experiments on round bars resulted in the production of single crystals in the parallel portion of bars 0·564 and 0·798 in. in diameter. The total volumes of the crystals were more than 1 cb.in., and more than 2 cb.in. respectively. The tensile properties were determined, and in every case a wedge-shaped fracture was produced, the bar diminishing principally in one dimension only. Remarkable twinning effects were observed in certain cases.—C. V. **Raman** and B. **Ray**: The transmission colours of sulphur suspensions. When a few drops of sulphuric acid are added to a dilute solution of sodium thiosulphate and a precipi-