Calendar of Scientific Pioneers.

January 7, 1786. Jean Etienne Guettard died.—The discoverer in 1752 of the extinct volcanoes of Auvergne and the compiler with Lavoisier of a mineralogical map of France, Guettard has been called "the father of all the national Geological Surveys."

January 7, 1893. Joseph Stefan died.—Professor of physics at Vienna and director of the Physical Institute, the law of cooling which bears Stefan's name was enunciated by him in 1879.

January 8, 1642. Galileo Galilei died.—The founder of the science of dynamics and one of the greatest of the early experimentalists, Galileo, wrote J. D. Forbes, "was beyond all comparison the glory of his age." Some years older than Kepler, Galileo was born in 1571 at Pisa, where he studied and lectured and made his experiments on falling bodies. The leaning Tower of Pisa now bears the inscription:

GALILEUS GALILEJUS
Experimentis E Summa Hac Turri Super Gravium
Corporum
Lapsu Institutis
Legibus Motis Detectis
Mechanicen Condidit
Ingentibusque Suis Posteriorumque Sophorum Inventis
Praelusit

The astronomical discoveries of Galileo were made while he held the chair of mathematics at Padua. In 1609 he heard of the invention of a crude telescope. Seizing upon the idea, he made an instrument to magnify thirty times, and within eighteen months he had observed the mountains and craters of the moon, seen the planets as discs, counted forty stars in the Pleiades, discovered four of the satellites of Jupiter, was perplexed by the curious appearance of Saturn due to the ring-system, observed the gibbous, as well as the crescent, phase of Venus, and had closely followed the spots in the sun. He was then at the zenith of his career. The greater part of his later life was passed at Florence, and to this period belong the controversies and persecutions which embittered his last days.

January 9, 1848. Caroline Lucretia Herschel died.—Returning to England with her brother William in 1772, Caroline Herschel for fifty years was his most patient, skilful, and zealous assistant. The minor planet Lucretia was named after her by Palisa in 1889.

January 10, 1778. Linnæus died.—Carl von Linné or Linnæus was born on May 3, 1707, at Roëshult, Sweden. A student at Lund and a lecturer at Upsala, through much poverty he clung to his first love of botany. An expedition to Lapland was followed by travels in Holland, England, and France. In 1741 he became professor of anatomy and physics in the University of Upsala, but the following year was appointed to the chair of botany. His last edition of his "Systema Naturæ" appeared in 1768.

January 10, 1833. Adrien Marie Legendre died. The contemporary of Laplace and Lagrange, and the instructor of Cauchy and Arago, Legendre was on the Commission for connecting Greenwich and Paris by triangulation, and made notable additions to various branches of higher mathematics.

January 12, 1665. Pierre de Fermat died.—Born in the province of Gascony, Fermat was trained as a lawyer, and became a councillor of the local Parliament at Toulouse. He was the correspondent of Descartes, Torricelli, Pascal, Huygens, Wallis, and others, and made additions to geometry, the calculus of probabilities, and the theory of numbers.

E. C. S.

Societies and Academies.

LONDON.

Faraday Society, December 13.—Sir Robert Hadfield, Bart., president, in the chair.—Prof. E. D. **Campbell**: A force field dissociation theory of solution applied to some properties of steel. Understanding of the properties of alloys has been obscured by the use of the term "solid solution" and by expressing constitution in terms of percentage weights. There is no essential difference between a liquid and a solid solution, and the constitution of both should be expressed as molecular or atomic concentrations per unit volume. The electrolytic dissociation theory in its usual form is inapplicable to alloys. The force field theory is a modified form of it applicable to liquid and solid solutions alike. The assumption is made that in a molecule the electromagnetic force field associated with the constituent atoms is closed in the combination, but in solution this force field is opened out by the solvent to an extent depending on concentration and composition. The reactivity of ions is due to the open force fields, and not to the presence of electric charges. In the presence of an impressed e.m.f. the resultant of the reactivity is electrical resistance in the case of metallic solutions, and electrical conductance in aqueous solutions.—A. L. **Norbury**: The electrical resistivity of dilute metallic solutions. It is well known that the small quantities of impurities in solid solution cause a large increase in the electrical resistivity of a pure metal. Data are collected showing the relative atomic effects of such impurities, and a certain relationship appears to be brought out by doing so. The author summarises his conclusions as follows:—(1) A comparison with the atomic volumes, intrinsic pressures, electrical resistivities, thermo-electric properties, and decomposition potentials of the elements concerned shows that none of these atomic properties can be directly applied to explain the results. It is suggested that the atomic effects are small when there is little electrical attraction between the atoms of solute and solvent, and large according as the electrical attraction between the two is greater. (2) It seems probable that in the dilute solutions quoted the atoms of solute are not associated. (3) Assuming, for example, the face-centred cube lattice in a dilute solid solution, an atom of solute will be surrounded by twelve equidistant atoms of solvent, and will not be attached to any one of these atoms in particular. It will, therefore, exert attractive forces on the electrons of the surrounding atoms. (4) It is generally assumed that metals conduct the electric current by means of their "free" electrons; the presence, therefore, of forces restraining the "free" electrons in solid solution will account for their diminished conductivity.

Geological Society, December 15.—Mr. R. D. Oldham, president, in the chair.—Dr. T. O. **Bosworth**: Structure and stratigraphy of the Tertiary deposits in north-western Peru. The westernmost ranges of the Andes in the north of Peru are of pre-Tertiary age. The Tertiary rocks occupy a narrow strip of country between the mountains and the sea, and they consist of 15,000 ft. to 25,000 ft. of clay-shales and sandstones, with thin seams of beach-pebbles and shells. During the Tertiary period a large subsidence was in progress. The stratigraphical succession is:

		Ft.
MIOCENE.	Zorritos Formation	5000+
EOCENE.	Lobitos Formation	5000+
	Negritos Formation.	
	Clavilithes Series, Turritella Series	7000+