Orsini's *Trattato del radio latino.* In the same year Pope Sixtus V called Danti to Rome, to assist the architect Domenico Fontana in raising the obelisk in St. Peter's Square. On his return from Rome, Danti, although unwell, left Alatri for the transfer of a monastery. He contracted pneumonia, of which he died at the age of forty-nine.

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DARBOUX, JEAN-GASTON (*b.* Nîmes, France, 14 August 1842; *d.* Paris, France, 23 February 1917), *mathematics.*

After having studied at the lycées at Nîmes and Montpellier, Darboux was admitted in 1861 to both the École Normale Supérieure and the École Polytechnique in Paris; in both cases he placed first on the entrance examinations. This—and the fact that he selected the École Normale—brought him a good deal of publicity. While a student at the École Normale, he published his first paper on orthogonal surfaces, which he studied in more detail in his doctoral thesis, *Sur les surfaces orthogonales* (1866).

From 1867 to 1872 Darboux taught in secondary schools. In the latter year his growing fame brought him a teaching position at the École Normale that he held until 1881. From 1873 to 1878 he held the chair of rational mechanics at the Sorbonne as *suppléant* of Liouville. In 1878 he became *suppléant* of Chasles at the Sorbonne, and two years later succeeded Chasles in the chair of higher geometry, which he held until his death. From 1889 to 1903 Darboux served as dean of the Faculté des Sciences. In 1884 he became a member, and in 1900 the *secrétaire perpétuel,* of the Académie des Sciences. A representative figure, Darboux was a member of many scientific, administrative, and educational committees and held honorary membership in many academies and scientific societies: Lebon (see below) lists more than a hundred.

Darboux was primarily a geometer but had the ability to use both analytic and synthetic methods, notably in the theory of differential equations. Conversely, his geometrical way of thinking enabled him to make discoveries in analysis and rational mechanics. Thus he followed in the spirit of Gaspard Monge, and Darboux's spirit can be detected in the work of Élie Cartan. This characteristic of Darboux's approach to geometry is fully displayed in his four-volume *Leçons sur la théorie générale des surfaces* (1887–1896), based on his lectures at the Sorbonne. This collection of elegant essays on the application of analysis to curves and surfaces is held together by the author's deep understanding of the connections of various branches of mathematics. There are many, sometimes unexpected, applications and excursions into differential equations and dynamics. Among the subjects covered are the applicability and deformation of surfaces; the differential equation of Laplace,

$$f_{uv} = A(u,v)f_u + B(u,v)f_v$$

and its applications; and the study of geodesics (these also in connection with dynamic systems) and of minimal surfaces. Typical is the use of the moving trihedral. Relying on the classical results of Monge, Gauss, and Dupin, Darboux fully used, in his own creative way, the results of his colleagues Bertrand, Bonnet, Ribaucour, and others.

In his *Leçons sur les systèmes orthogonaux* (1898), he returned to his early love, with new results: the cyclids, the application of Abel's theorem on algebraic integrals to orthogonal systems in n dimensions, and other novel types of orthogonal systems. Earlier than these two books was *Sur une classe remarquable de courbes algébriques* (1873), in which he made an analytic and geometric investigation of the cyclids, of which an early example had been given by Dupin and which can be obtained by inversion from quadrics. Full use is made of imaginary elements, in the tradition of Poncelet and Chasles.

Darboux also did research in function theory, algebra, kinematics, and dynamics. His appreciation of the history of science is shown in numerous addresses, many given as *éloges* before the Academy. He also edited Joseph Fourier's *Oeuvres* (1888–1890).

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Dirk J. Struik

D'ARCET, JEAN (*b.* Doazit, near St. Sever, Landes, France, 7 September 1725; *d.* Paris, France, 12 February 1801), *chemistry.*

While still very young, d'Arcet was disinherited and left penniless because he decided to devote his life to science instead of following his father in the legal profession. Fortunately, Augustin Roux introduced him to Montesquieu, who took him to Paris in 1742 to be tutor to his son.

Although he became *docteur-régent* of the Faculty of Medicine in Paris on 18 November 1762, d'Arcet never practiced medicine. Rather, he began to attend G. F. Rouelle's courses in chemistry and was so profoundly influenced that he spent the rest of his life in the study of this science. D'Arcet was made professor at the Collège de France in 1774 and was a member of the Paris Académie des Sciences from 1784 until its suppression in 1793. He became a member of the Institut de France at its formation in 1795.

D'Arcet's first major work was a long series of experiments on the action of heat on minerals. The results, read to the Academy in 1766 and 1768, threw new light on the classification of minerals and developed and extended the work of J. H. Pott. It also laid the foundation for the manufacture of true porcelain (*porcelaine dure*) in France. It was quickly followed by work on the action of heat on the diamond and other precious stones (1771, 1773), in which he demonstrated the complete destructibility of the diamond when it is heated in air and distinguished it from other precious stones, such as rubies and emeralds.

During a series of experiments on fusible alloys, d'Arcet made one of lead, bismuth, and tin that was liquid at the temperature of boiling water and found a use in the production of stereotype plates (1775). Further work on alloys, some done in collaboration with Bertrand Pelletier, enabled him to develop a method of separating the copper from church bells and to show how these bells could be melted down to cast cannon (1791, 1794).

Together with the work already discussed, d'Arcet's publication on the geology of the Pyrenees (1776) and his researches on the action of strong heat on calcareous earth (calcium carbonate), published in 1783, indicate that his interest in minerals and their analysis dominated his work throughout his career. That he did not confine himself entirely to this field, however, is shown by his translation into French of the work on viper venom by Felice Fontana and his work on the extraction of gelatin from bones.

Since much of d'Arcet's work had a direct bearing on industrial techniques, he was appointed to several important posts in this field. As inspector at the Gobelins dye works he was able to improve some of the dyeing processes, and he succeeded P. J. Macquer as director of the porcelain works at Sèvres. He also served as inspector general of the mint.

During the last few years of his life d'Arcet did little