

"French Academy of Sciences."  
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FRENCH ACADEMY  
OF SCIENCES

THE SIGNIFICANCE OF ADMISSION  
TO IT

Franklin, Rumford, and Newcomb the Only Americans to  
Attain the Honor--Great Men Who Have Been  
Members of the Association--Abolishment  
of the Royal Academies in 1790

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In view of the fact that but three Americans, Franklin, Rumford, and Newcomb, have been admitted to this famous body, it may be curious to inquire what the significance of admission to it is, as well as that of non-admission. As Richelieu had imagined the Académie Française, so Colbert in 1666 started the Académie Royale des Sciences, making the Abbé Bignon, who was virtually his employee, his instrument in doing so, and presenting the Academy with a house of his own in the Rue Vivienne, behind the present Bibliothèque Nationale. But it was not until 1699, when Colbert, and Louvois too, had long made their exits from the world's theatre, that the rule was adopted limiting the number of associés étrangers to eight. There were at that time already three foreign members--Leibniz; the mathematician Von Tschirnhausen (whose algebraic transformation is still important); and Guglielmini, the great authority upon hydraulics before Du Buat. Five more foreigners were at once elected--Hartsoeker, a very remarkable philosopher who has been too much forgotten; Newton; the two great perfectioners of the calculus, Jacob and John Bernoulli; and Viviani, also celebrated for his mastery of the calculus, and the author of a still-remembered problem about a dome. He had been a friend of Colbert, and his election was not warranted by his scientific eminence alone. It will be remarked that every one of these eight were mathematicians more than anything else, and neither Boyle nor Von Guericke (both then dead) had ever been noticed by the Academy, nor had any anatomist (Hartsoeker, however, had, as a boy, made a wonderful discovery in anatomy.)

But the exclusive reign of geometry was not destined to last long. In its early years the Academy had a difficulty in finding so many as eight foreign scientists whom it wished to associate with itself, and very soon began to elect patrons of science and other men whose countenance might lend it dignity. One of the original eight, Viviani, was more or less a courtier. His successor (he dying September 22, 1703) Poli, resembled him in that respect; and Poli, having been naturalized as a Frenchman (in 1713) was succeeded in his place among the eight by the Count di Marsigli, who, as an Austrian general, had been cashiered for betraying the interests of his sovereign in a treaty with the French, and thenceforward became a Maecenas of science. Bianchini, too, who came in immediately after the death of Jacob Bernouilli (August 16, 1705) was far less eminent as an astronomer than as a papal chamberlain. Sir Hans Sloane, who followed the Graf von Tschirnhausen (October 11, 1718) though a botanist as well as a medical man, was not an original researcher, and his achievements, important as they were for science and for humanity, were altogether of a practical kind. Finally, Guglielmi, dying in the summer of 1810 (July 4), when Louis XIV was bent, by all means, upon appeasing England, the vacancy was filled by the election of an Earl of Pembroke, a person not known, we believe, to have had any other relations with the world of science; and, in the year of the great monarch's death, Pembroke was succeeded by the Spanish ambassador near the court of Versailles, a Duc d'Escalon, who was perhaps president of some Spanish academies, but nothing more, unless, maybe, personally congenial to Philip of Orleans.

#### DECADENCE OF THE ACADEMY.

Consequently, after the death of Leibniz (November 14, 1716), through near a decade, while there were seven foreign members, a minority of them only, Hartsoeker, Newton, and John Bernouilli, were very considerable men of science. When the place of Leibniz was filled at last, it was filled in a strange manner indeed. It ought naturally to have gone to Baron Christian von Wolff, the codifier of Leibnizianism, and no small man, by any means; but his philosophy was supposed to be too infidel for the France of the Regency; and so, when the attacks upon him were at their height, in 1725, De Crousaz, the author of a voluminous logic, the apostle of eighteenth-century "good sense" as applied to purely theoretical questions, and quite supercilious toward the philosophy of Leibniz, was chosen to the place. In 1733, however, the rage against Wolfius having subsided, he was chosen in the stead of the Duc d'Escalon. Thus, there were two seats which were in some sense Leibniz's--the one held in the sequel by De Crousaz, Bradley, Linnaeus, and John Hunter, the other by Wolff, Haller, and Bonneti, broad philosophers all three. This was the place that Rumford was conceived to fill in the institute; and he was succeeded by Watt, then by Davy, and to-day by Kelvin. The other Leibnizian place went successively to Volta, Young, Dalton, and Faraday, then apparently to the mathematician Kummer, and finally to Lister.

Newton, too, may be claimed as the father of two different seats. For, on the death of Hartsoeker, December 10, 1725, Newton being every way incapacitated, an astronomer, Manfredi, was elected to that place. He was

succeeded by an engineer, Poleni, then by Euler, then by three astronomers, Wargentin, J. A. Euler, son of the great Leonard), and, after the establishment of the Institute, by Maskelyne. Here Jenner broke the tradition and after him Wollaston; but after him it went back to astronomy in Olbers, followed by Bessel, who was succeeded by the pure mathematician C. G. J. Jacobi, beyond which point the succession is hard to trace. For be it understood that there are no fauteuils. The places have no official identity. The list is always arranged in the chronological order of elections. Nevertheless, the different seats are recognized as having, in considerable measure, especially in the old Royal Academy, each its distinct individuality. It comes about very naturally, and necessarily in this way. Different interests will and must exist in the Academy--the interests of the different departments of science, to name no others. These different interests struggle for recognition in the selections. All Americans know, only too well, that it would be so. It is all very well to say that the eight most eminent men of science are to be chosen "wherever found" (as Carnegie's trust deed expresses it). The different interests will differ as to who they are. The anatomists protested when there was not one of their brethren on the list; the physicists protested when the exact sciences had but two representatives. Thus, when a place is vacant, the line of least resistance points to the filling of it by a man of the same kind. There will even be a certain amount of log-rolling. One party will say to another, "If you will only vote for our candidate to-day, so that history may record his having been on the list, then, when old So-and-So, of our department, dies, and he cannot hold out very long, we will vote for whomever you may name." By carefully taking account of the facts, the really intended line of succession--or the line of force, if you will--can usually be made out with great confidence, even in those frequent cases in which a change in the relative strength of different interests causes the new selection to be governed by new motives.

#### NEWTON'S SUCCESSOR.

The result of the election of an astronomer to fill Hartsoeker's place was that when Newton died (March 31, N.S., 1727), the fact that anatomy was entirely unrepresented among the eight caused the election of Fredrik Ruisch; and when he died (February 22, 1731), the great pathological anatomist Morgagni succeeded him. Upon his death, however (December 5, 1771), Newton's place reverted to mathematics in the person of Lagrange, who was born a Lombard. Newton, however, was not regarded merely, or chiefly, as the representative of astronomy, for in France none of his theories had met with favor, while his priority in the composition of white light was contested. But in the old Academy it was thought proper that the Royal Society in its president or secretary, should be represented among the eight. As president of the Royal Society, therefore, Newton should have a successor. Accordingly, when the Veronese Francesco Bianchini, illustrious in the Roman court, and indefatigable in small works in archaeology and astronomy, died (March 2, 1729), Halley, a patron of science (he had paid for the printing of Newton's 'Principia'), secretary of the

Royal Society, and an active astronomer in his youth, was chosen in his place, and was, in one way, a successor of Newton. He was succeeded by Folkes and Macclesfield, presidents of the Royal Society, by other patrons of science, and subsequently by Sir John Pringle, another president of the Royal Society. But after Pringle this seat seems to have gone to the comparative anatomist Camper. The result of this break in the tradition was that Sir Joseph Banks, president of the Royal Society, was elected, not to this but to the true Newtonian place, as soon as Lagrange had taken a chair among the French members in 1787; and Banks held on until his death (May 19, 1820), Gauss then became the successor of Newton, and was succeeded, first by Sir John F. W. Herschel, then by Sir George Biddell Airy, then by Helmholtz, and finally, in 1895, by our Simon Newcomb. Banks was succeeded by Berzelius; Berzelius by Sir David Brewster; Brewster by Sir Roderick Impey Murchison, and Murchison by Louis Agassiz in 1872. After him the succession becomes confused.

BENJAMIN FRANKLIN'S SEAT.

Another seat interesting to Americans is that held by Franklin, who, by the by, was elected long before the Parisians had made him their idol or had so much as laid eyes upon the figure that was so calculated to impress their imagination. The line seems to have been: Viviani, Poli, Marsigli, Boerhaave, Cervi (a court physician), Van Swieten, Franklin, Black, and, after the establishment of the Institute, Cavendish, Alexander von Humboldt, Ehrenberg, Don Pedro d'Alcantara, Nordenskiöld, Schiaparelli.

It will be remembered that all the Royal Academies were abolished in 1790, and remained in abeyance until Napoleon established the Institute in 1802. Subsequently, the Institute was broken up into academies held together by certain bonds. But the present Academy of Sciences is thoroughly regarded as the continuation of the old one. Thus, three of the old associés étrangers surviving in 1802, Priestley, Banks, and Herschel, they were assumed to be in the same relation to the Institute; and four elections were at once made--Maskelyne, astronomer royal, to succeed, the astronomer, J. A. Euler; Pallas, an exploring naturalist, to succeed H. B. De Saussure, a geologist well known to the general public for his picturesque descriptions of the Alps; the philosophical Rumford to succeed Bonnet; and Cavendish to succeed Black. The eighth place was filled in 1804 by Volta. In the new Academy, Don Pedro has been the only foreign associate who has not been professionally a man of science. With few exceptions, all the rest have been eminent leaders in scientific research.

Although no considerable body of men can ever draw up such a list as successfully as any one of them would, if the full responsibility for it could be thrown upon him (as it never could be), yet the French Academy is, all things considered, the most fit to perform the task of any body in the world; and the members individually all take greater pains about doing it properly than would be the case in most other Academies. Therefore, an election of a man as foreign associate of the French Academy of Sciences has become the highest assurance to the non-scientific world that it may trust in that man as a scientist of the first order. On the other hand, the omissions have been unspeakable, monstrous. In mathematics, where is

Riemann--to say nothing of Abel, Steiner, Clebsch, Klein, Cayley, Lie, Hamilton, Grassmann, any one of whom has been more important for the progress of mathematics than, say, Tchebichef? In logic, where is Boole? In physics, where are Maxwell, Youle, Clausius, Willard Gibbs, and others? In chemistry, where are Graham, Mendeléef, Ostwald, Kekulé--not to speak of Victor Meyer, of Van der Waals, Van t'Hof, Arrhenius? In biology, where is Darwin? A list that excludes Maxwell and Darwin--even had both not been living when Don Pedro was elected--characterizes itself, negatively. That a given man is not on the list, has absolutely no significance at all.