On the 16th of August, 1757, he performed the experiment with magnificent success, obtaining sparks of lightning one inch thick and ten feet in length. Charles, it is said, did most to give popularity and fame to the kite experiment.

Charles, who was fortunate in having Fresnel as his successor and Fourier as his eulogist in the French Academy, was born at at Baugency on the 12th of November, 1746. He was inspired to undertake physical investigations by the brilliancy of Franklin's career. To this end he left the public service, and lectured on science for thirty years, being honored sometimes by the presence of Franklin and Volta. Franklin complimented his experimental skill by confessing that Nature refused nothing to him, but obeyed him as her master. It is worth remembering, as being perhaps partly the secret of his success, that he studied the minutest points of his lectures with remarkable care; and often expended days in preparing an experiment in his laboratory which flashed off before the public in a few minutes. Among several who experimented with the kite, we may mention Cavallo, who discovered as Islington, in 1775, a large amount of electricity in the air when there was no thunder, and only here and there a solitary cloud. About 1800, Cuthbertson tried experiments on atmospherical electricity with a kite. He made the remarkable observation that the spark was very pungent when a long string was used, and from experiments with an electrical machine he came to the accurate conclusion, that the increased intensity was caused in some way (now better understood) by the length of the string as such, and not by the greater elevation of which a long string admitted. When a jar was slightly charged and the spark was only one tenth of an inch in length, it gave a smart shock if the charge was sent through a long string. For attaining unusual elevations, Cuthbertson conceived the idea of sending out one kite after another, in tandem style, sometimes to the number of three, each with five hundred feet of wire. The opposite currents, which are often encountered at different heights, make this experiment a very difficult one. Sturgeon, of Woolwich, England, made four hundred kite experiments, extending over a period of six years. He describes at length an experiment at Addiscombe in March, 1824. When he had half a mile of string out, he obtained a rapid series of sparks, through a plate of air one and a half inches thick. In the afternoon he attached the lower end of this string to the back of another kite, so as to let out one quarter of a mile more of string. Now the sparks became painful. At other times, even with three kites deployed in line, the electrical effects were insignificant. In hot and sultry weather, Sturgeon found the shocks violent when the kite had risen no higher than a church-steeple, and the string not even insulated. Sometimes they became so intolerable, that he could not pay out the string through the hand, and was obliged to use a reel. Electric disturbances were felt often when the kite was not within a quarter of a mile of any cloud. These were the effects of electrical induction. Sturgeon remarks that "Sergeant Rudd, of the Royal Artillery, if still alive, remembers well the effect of an electrical wave. Having presented his hand to the kite-string several times without experiencing even a spark, in the Artillery Barrack grounds at Woolwich, he began to laugh at the idea of electric shocks from the air. Shortly, however, I espied a cloud making its appearance behind the Repository, and on its approach asked the Sergeant to try again. He did so, but before he got his hand near to the string, a discharge struck it and sent the sceptic reeling, to the great amusement of his brother non-commissioned officers who were present." On the 29th of March, 1842, Sturgeon floated his kite with three hundred yards of wired cord just before the approach of a hail-storm, when he obtained a rapid succession of sparks through an interval of air six inches in length, or a constant stream of fire through a length of three inches. It was no unusual sight for the string and reel to bristle with purple light, and the blades of grass for yards around to be tipped with fire. Once Sturgeon lost a kite by the melting of the wire nine hundred feet from the ground. A cloud was visible, but no thunder was heard. In 1834 a man received a severe shock from a kite-string which he touched with a stick four feet long. This occurred during a hail-storm. On one occasion, Sturgeon received a shock through three feet of dry ribbon, attached as a handle to the kite-string, when no visible cloud was within a mile. The end of the string was tied to a tree, and it was not possible to take down the kite until a cloud far to the windward had passed over to the leeward. And generally, the presence of a cloud makes a decided effect on the electrical activity of the atmosphere. Franklin and Saussure were under the persuasion that lightning never issued from a lone cloud. But Arago has adduced five cases in which destruction to trees and animals has come forth from this source. As such a cloud approaches the kite, the electrical sparks drawn from the string increase in length and intensity.

Weekes has objected to the kite experiment as a proper means of studying atmospherical electricity, because it is calculated to give only local phenomena. He thinks that the more general features of the case would be better obtained by horizontal wires of great length, and presenting a large amount of surface to the influence of the air. About 1841, Weekes erected a wire for this purpose at Sandwich, on the south-east coast of England. This wire was stretched over the town, a distance of 1095 feet, and one end was attached to the vane-spindle on the tower of St. Peter, and the other to the vane-spindle on the tower of St. Clement. The elevation of the wire at the two extremities was one hundred and thirty-six feet above a base line running between the two edifices. Its average elevation above the sea was fifty-five feet. A vertical wire was attached to the middle of this horizontal wire, and descended into the room of the observer. Provision was made to carry the charge, in whole or in part, to a distant well, whenever it became dangerous in magnitude or suited the purpose of the observer to do so. Weekes observes, that, "even the light and feathery aggregations of the summer cloud are sufficient to effect the electroscope, through their inductive action on the outstretched wire. And when thunder-clouds were forming, the action was so potent that liquids were chemically decomposed, metals were deflagrated, and large quantities of coated surface were charged and discharged in a few seconds. Some inconvenience arose from the weight of birds, particularly of swallows, which settled on the wire. Sometimes they occupied the whole length of wire in a protracted session, debating as it might seem in relation to their autumnal departure for fairer climes. Weekes remarked, that on the 16th of September, 1840, during a sudden rain, there were witnessed furious discharges of sparks from ball to ball of his apparatus, though there was but little thunder, and an interval of five or six seconds between the flash and the report showed that that little was a mile distant. Weekes after a time found it necessary to confine the horizontal wire near the middle, to protect it from the violence of the winds. Before he did so, it gave out music, as the telegraph-wires are known to do, like a vast Æolian string. His neighbors regarded these sounds with superstitious awe, and predicted that no good would come of them. No good did come to Weekes; for they persecuted him in all the little ways which are still possible in an age of freedom and intelligence.

The apparatus and experiments of Weekes have served to attract attention to observations which Crosse had been making