



1. HONORS

Throughout December 1783 the Academy of Science occupied itself with reaching provisional judgments upon the accomplishments of the past half-year in aviation and with planning for its development in the future. The commission named in July, though appointed to consider the Montgolfier invention, had naturally included the Charles balloons within its purview. Its members had attended all the experiments and demonstrations except the test in early October when Etienne privately tried the balloon himself. Among the eight commissioners, the two who counted for most were Lavoisier and Desmarest, Lavoisier because of his preeminence in science and his influence with government, Desmarest because of his knowledge of the background. All except the latter had been ignorant of the Montgolfier technique until Etienne exhibited it in the disastrous demonstration of 12 September in the Réveillon factory. By the time of their report in December, they made no doubt that hot air balloons drew lifting force from the expansive effect of heat whereas the Charles variety depended on the production of a gas different from the atmosphere.¹

In the eyes of the commissioners, the contrast had thus become one between physical and chemical methods, though they did not put it that way. Etienne may have helped to sharpen the distinction, albeit unwittingly. The commissioners referred in their report to the memoir that he had read before the Academy on 15 November. They stated that he and his brother had systematically investigated the lifting potentiality of every vapor lighter than air, and had considered steam, hydrogen, and various products of combustion before settling on the dilation of ordinary air by

heat as the simplest and cheapest technique. In fact the 15 November memoir—the same that Joseph, who wrote it, presented before the Academy of Lyons on 25 November—was nothing like so categorical. The brothers dismissed the possibility of inflammable air with little more than a mention. The expense would have been prohibitive. In the latter part of the memoir, Joseph developed the opinion that the effects of electricity augment the buoyancy due to heat.² It would appear, therefore, that the commission attributed its own view of the alternatives to the inventors. In any case, they acknowledged the justice of the Montgolfier choice. After all, combustion of eighty pounds of straw and seven or eight of wool at Versailles had sufficed to lift a load of almost a thousand pounds in less than ten minutes.

The Charles alternative, the commission allowed, was far costlier in the current state of the art. At the same time it was natural that chemists and physicists in the capital, many of them preoccupied with newly discovered gases in their own research, should have looked to hydrogen. The success of the Charles-Robert flights was undeniable, and who knew whether a gas lighter than hydrogen might turn up? The science of gases, even like the age of flight, was in its infancy. The Montgolfiers for their part had already proposed several improvements in their technique. Clearly, it was much too soon to make a choice. All that could be said provisionally was that the facility and economy of the Montgolfier method bade fair to make it preferable for civil uses, whereas the hydrogen alternative, lifting the same weight with a much smaller balloon and requiring no replenishment of fuel in flight, might well offer advantages for scientific uses. The meteorological observations Charles had made at a great altitude showed how much was to be learned.³