"Having thus glanced briefly at his career, I now pass to the discovery upon which Count Rumford's fame in the future will chiefly rest. It is described in a paper published in the transactions of the Royal Society for 1798.

"He was led to it while superintending the operations of the Munich arsenal, by observing the large amount of heat generated in boring brass cannon. Reflecting upon this, he proposed to himself the following questions: Whence comes the heat produced in the mechanical operations above mentioned? Is it furnished by the metallic chips which are separated from the metal?

"The common hypothesis affirmed that the heat produced had been latent in the metal, and had been forced out by *condensation* of the chips. But if this were the case, the capacity for heat of the parts of metal so reduced to chips ought not only to be changed, but the change undergone by them should be sufficiently great to account for *all* the heat produced. With a fine saw Rumford then cut away slices of the unheated metal, and found that they had *exactly the same capacity for heat as the metallic chips.* No change in this respect had occurred, and it was thus conclusively proved that the heat generated could not have been held latent in the chips. Having settled this preliminary point, Rumford proceeds to his principal experiments.

"With the intuition of the true investigator, he remarks that 'very interesting philosophical experiments may often be made, almost without trouble or expense, by means of machinery contrived for mere mechanical purposes of the arts and manufactures.' Accordingly, he mounted a metallic cylinder weighing 113.13 pounds avoirdupois, in a horizontal position. At one end there was a cavity three and a half inches in diameter, and into this was introduced a borer, a flat piece of hardened steel, four inches long, 0.63 inches thick, and nearly as wide as the cavity, the area of contact of the borer with the cylinder being two and a half inches. To measure the heat developed, a small round hole was bored in the cylinder near the bottom of the cavity, for the insertion of a small mercurial thermometer. The borer was pressed against the base of the cavity with a force of 10,000 pounds, and the cylinder made to revolve by horse-power at the rate of thirty-two times per minute. At the beginning of the experiment the temperature of the air, in the shade, and also in the cylinder was 60°F.; at the end of thirty minutes, and after the cylinder had made 960 revolutions, the temperature was found to be 130°F.