it meets with proper receptacles, from which it supplies the fountains. Now this is a mere hypothesis, without foundation or probability : for, in the first place, we know of no internal heat of the earth sufficient to cause such evaporation ; or if that were allowed, yet it is quite incredible that there should be any caverns so smooth and void of protuberances as to answer the ends of an alembic, in collecting and condensing the vapours together in every place where foun tains arise. Varenius,and others, suppose that the water may rise through the pores of the earth, as through capillary tubes, by attraction. But here they show that they are quite unacquainted with what relates to the motion of a fluid through such tubes : for when a capillary tube opens into a cavity at its upper end, or grows larger and larger, so as to cease to be capillary at that end, the water will not ascend through that tube into the cavity, or beyond where the tube is capillary ; because that part of the periphery of the cavity, which is partly above the surface of the water, and partly below it, is not of the capillary kind. Nay, if the cavity is continually supplied with water, it will be attracted into the capillary tube, and run down it as through a funnel, if the lower end is immerged in the same fluid, as in this case it is supposed to be.

It has been a generally received opinion, and much espoused by Mariotte, a diligent observer of nature, that the rise of springs is owing to the rains and melted snow. Ac cording to him, the rainwater which falls upon the hills and mountains, penetrating the surface, meets with clay or rocks contiguous to each other; along which it runs, without being able to penetrate them, till, having descended to the bottom of the mountain, or to a considerable distance from the top, it breaks out of the ground, and forms springs.

In order to examine this opinion, Mr. Perrault, De la Hire, and Sideleau, endeavoured to make an estimate of the quantity of rain and snow that falls in the space of a year, with the view of ascertaining whether it would be sufficient to afford a quantity of water equal to that which is annually discharged into the sea by the rivers. The result of their inquiries was, that the quantity of rain and snow which fell in a year into a cylindrical vessel would, if secured from evaporating, fill it to the height of about nineteen inches. This quantity, Sideleau shewed, was not sufficient to supply the rivers ; for those of England, Ireland, and Spain, dis charge a greater quantity of water annually, than the rain, according to that experiment, is able to supply. Another observation was made by them at the same time, viz., that the quantity of water raised in vapour, one year with an other, amounted to about thirty-two inches, which is thirteen more than falls in rain ; a plain indication that the water of fountains is not supplied by rain and melted snow.

Thus the true cause of the origin of fountains remained undiscovered, till Dr. Halley, in making his celestial observations upon the tops of the mountains at St. Helena, about eight hundred yards above the leveI of the sea, found, that the quantity of vapour which fell there, even when the sky was clear, was so great, that it very much impeded his observations, by covering his glasses with water every half quarter of an hour ; and he attempted to determine by experiment the quantity of vapour exhaled from the surface of the sea, as far as it rises from heat, in order to try whether that might be a sufficient supply for the water continually discharged by fountains. The process of his experiment was as follows. He took a vessel of water salted to the same degree with that of sea water, in which he placed a thermometer ; and by means of a pan of coals brought the water to the same degree of heat which is observed to be that of the air in our hottest summer ; he then fixed the vessel of water with the thermometer in it to one end of a pair of scales, and exactly counterpoised it with weights on the other. At the end of two hours, he found, by the alte ration made in the weight of the vessel, that about a

sixtieth part of an inch of the depth of the water was gone off in vapour ; and therefore, in twelve hours, one tenth of an inch would have gone off. Now, this accurate observer allows the Mediterranean sea to be forty degrees long, and four broad, the broader parts compensating for the narrower, so that its whole surface is one hundred and sixty square degrees ; which, according to the experiment, must yield at least 5,280,000,000 tons of water. In this account no regard is had to the wind and the agitation of the surface of the sea, both which undoubtedly promote the evaporation. It now remained to compare this quantity of water with that which is daily conveyed into the same sea by the rivers. The only mode of proceeding was to compare them with some known river, and accordingly he takes his computation from the river Thames; and, to avoid all objections, makes allowances, probably greater than what were absolutely necessary.

The Mediterranean receives the following considerable rivers, viz., the Ebro, the Rhone, the Tiber, the Po, the Danube, the Niester, the Borysthenes, the Tanais, and the Nile. Each of these he supposes to bring down ten times as much water as the Thames, and he thus makes an allowance for smaller rivers which fall into the same sea. The Thames, then, he finds by mensuration, to discharge about 20,300,000 tons of water aday. If, therefore, the above nine rivers yield ten times as much water as the Thames, it will follow, that all of them together yield but 1827 millions of tons in a day, which is little more than one third of what is proved to be raised in vapour out of the Mediterranean in the same time. Here, therefore, we have a source abundantly sufficient for the supply of fountains.

Now, having found that the vapour exhaled from the sea is a sufficient supply for the fountains, he proceeds, in the next place, to consider the manner in which they are raised, and how they are condensed into water again, and convey­ed to the source of springs. He considers, that if an atom of water expanded into a shell or bubble, so as to be ten times as large in diameter, as when it was water, that atom would become specifically lighter than air ; and therefore would rise so long as the warmth which first separated it from the surface of the water should continue to distend it to the same degree ; and consequently, that vapours may be raised from the surface of the sea in that manner, till they arrive at a certain height in the atmosphere, at which they find air of equal specific gravity with themselves. Here they will float, till, being condensed by cold, they become specifically heavier than the air, and fall down in dew ; or, being driven by the winds against the sides of mountains (many of which far surpass the usual height to which the vapours would of themselves ascend,) are compelled by the stream of the air to mount up with it to the tops of them ; where, being condensed into water, they presently precipitate, and gleeting down by the crannies of the stones, part of them enters into the caverns of the hills; which being once filled, all the overplus of water that comes thither, runs over by the lowest place, and breaking out by the sides of the hills, forms single springs. Many of these running down by tlιe valleys between the ridges of the hills, and coming to unite, form little rivulets or brooks ; many of these again meeting in one common valley, and gaining the plain ground, being grown less rapid, become a river ; and many of these being united in one common channel, make such streams as the Rhine and the Danube ; which latter, he observes, one would hardly think to be a collection of water condensed out of vapour, unless we consider how vast a tract of ground that river drains, and that it is the sum of all those springs which break out on the south side of the Carpathian mountains, and on the north side of the immense ridge of the Alps, which is one continued chain of mountains from Switzerland to the Black Sea.

Thus one part of the vapours which are blown on the