eſtimate of the quantity of rain and ſnow that falls in the space of a year, to ſee 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 fill it (if ſecured from evaporating) to the height of about nineteen inches. Which quantity D. Sideleau showed, was not sufficient to ſupply the rivers ; for that those of England, Ireland, and Spain, diſcharge a greater quantity of water annually, than the rain, ac­cording to that experiment, is able to ſupply. Beſides which, another obſervation was made by them at the same time, viz. that the quantity of water raiſed in va­pour, one year with another, 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 800 yards above the level 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 upon that 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 ; this done, he 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 : then, at the end of two hours, he found, by the alteration 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 160 ſquare degrees) ; which, according to the experiment, muſt yield at leaſt 5,280,000,000 tons of water : In which account no re­gard is had to the wind and the agitation of the ſurface of the ſea, both which undoubtedly promote the evapo­ration.

It remained now to compare this quantity of water with that which is daily conveyed into the ſame ſea by the rivers. The only way to do which 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 abſolutcly neceſſary.

The Mediterranean receives the following conſiderable rivers, viz. the Iberus, the Rhone, the Tyber, 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, whereby he allows 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 a-day. If therefore the above-said nine rivers yield ten times as much water as the Thames doth, it will follow, that all of them to­gether yield but 1827 millions of tons in a day, which is but little more than one-third of what is proved to be raiſed in vapour out of the Mediterranean in the ſame time. We have therefore from hence 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 ſources of ſprings.

In order to this he considers, that if an atom of water was expanded into a ſhell or bubble, ſo as, to be ten times as big 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 the 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 land is returned by the rivers into the ſea from whence it came. Another part falls into the ſea before it reaches the land ; and this is the reaſon why the ri­vers do not return ſo much water into the Mediterra­nean as is raiſed in vapour. A third part falls on the low lands, where it affords nouriſhment to plants ; yet it does not rest there, but is again exhaled in vapour by the action of the ſun, and is either carried by the winds to the ſea to fall in rain or dew there, or else to the mountains to become the ſources of ſprings.

However, it is not to be ſuppoſed that all fountains are owing to one and the ſame cauſe ; but that ſome proceed from rain and melted ſnow, which, ſubſiding