particles ; for the denſity of water is to that of ſpirits nearly as 6 to 5, and the changes of specific gravity are nearly as 6 to 3.

We alſo ſee that the changing cauſe, which produces the abſolute condenſation of each ingredient, ceaſes to operate when 75 parts of water have been mixed with 25 of alcohol: for the variation of specific gravity, from diminiſhing comes now to increaſe ; and therefore, in this particular ſtate of compoſition, is equable. Things are now in the ſame ſtate as if we were mixing two fluids which did not act on each other, but were mutu­ally diſſeminated, and whoſe specific gravities are nearly as 9 to 10 ; for the variation 9 of specific gravity may be conſidered as the 100th part of the whole difference, in the ſame manner as 17,5 would have been had water and alcohol ſuſtained no contraction.

The imagination is greatly aſſiſted in the contempla­tion of geometrical quantity by exhibiting it in its own form. Specific gravity, being an expreſſion of denſity (a notion purely geometrical), admits of this illuſtration.

Therefore let AB (fig. 4.) repreſent the bulk of any mixture of water and alcohol. The specific gravity of water may be repreſented by a line of ſuch a length, that AB ſhall be the difference between the gravities of alcohol and water. Suppoſe it extended upwards, to­wards *a,* till B *a* is to A *a* as 10,000 to 8250. It will suit our purpoſe better to repreſent it by a parallelo­gram *a* BFe, of any breadth BF. In this caſe the dif­ference of the specific gravities of alcohol and water will be expreſſed by the parallelogram ABFE. If there were no change produced in the denſity of one or both ingredients, the specific gravity of the compound would increaſe as this parallelogram does, and AGHE would be the augmentation correſponding to the mixture of the quantity AG of alcohol with the quantity GB of water, and ſo of other mixtures. But, to expreſs the augmentation of denſity as it really obtains, we must do it by ſome curvilineal area DABCHD, which va­ries at the rate determined by Sir Charles Blagden’s ex­periments. This area muſt be preciſely equal to the rectangle ABFE. It muſt therefore fall without it in ſome places, and be deficient in others. Let DMHKC be the curve which correſponds with theſe experiments. It is evident to the mathematical reader, that the ordi­nates LM, GH, IK, &c. of this curve are in the ulti­mate ratio of the differences of the obſerved specific gravities. If A α, αβ, &c. are each =5*,* the little ſpaces A α δ D, α *β b δ* &c. will be preciſely equal to the diffe­rences of the specific gravities 0,8250; 0,8387; 0,85 16; &c. correſponding to the different mixtures of water and alcohol. The curve cuts the side of the parallelo­gram in K, where the ordinate GK expreſſes the mean variation of denſity 0,0017,5. IK is the ſmalleſt va­riation. The condenſation may be expreſſed by draw­ing a curve *dm G kſ* parallel to DMGKF, making D *d —* AE. The condenſation is now repreſented by the ſpaces comprehended between this laſt curve and the abſciſſa AGE, reckoning thoſe negative which lie on the other side of it. This shows us, not only that the condenſation is greateſt in the mixture AG X GB, but alſo that in mixing ſuch a compound with another AIxlB, there is a rarefaction. Another curve ANPOB may be drawn, of which the ordinates LN, GP, 10, &c. are proportional to the areas AL *md,* AGmD, AIZGmD (=AGmD—GIk), &c. This curve ſhows the whole condenſation.

This manner of repreſenting the specific gravities of mixtures will ſuggeſt many curious inferences to ſuch as will conſider them in the manner of Boſcovich, with a view to aſcertain the nature of the forces of coheſion and chemical affinities: And this manner of viewing the ſubject becomes every day more promiſing, in conſequence of our improvements in chemical knowledge; for we now see, that mechaniſm, or motive forces, are the causes of chemical action. We ſee in almoſt every caſe, that chemical affinities are comparable with me­chanical preſſures; becauſe the converſion of a liquid in­to a vapour or gas is prevented by atmoſpheric preſſure, and produced by the great chemical agent heat. The action of heat, therefore, or of the cauſe of heat, is a mechanical action, and the forces are common me­chanical forces, with which we are familiarly acquaint­ed.

“ It may be alſo remarked in the column of contrac­tions, that in the beginning the contractions augment nearly in the proportion of the quantity of ſpirits (but more ſlowly) ; whereas, in the end, the contractions are nearly in the duplicate proportion of the quantity of water. This circumſtance deserves the conſideration of the philoſopher. We have repreſented it to the eye by the curve α *g h d.’’*

We ſhould here take ſome notice of the attempt made to elude ſome part of the duties, by adding ſome ingre­dient to the ſpirits. But our information on this ſub­ject is not very exact ; and beſides it would be doing no ſervice to the trader to put fraud more in his power. There are ſome salts which make a very great augmen­tation of denſity, but they render the liquor unpala­table. Sugar is frequently uſed with this view ; 16 grains of refined ſugar diſſolved in 1000 grains of proof ſpirits gave it no ſuſpicious taſte, and increaſed its specific gra­vity from 0,920 to 0,925, which is a very great change, equivalent to the addition of 9 grains of water to a mixture of 100 grains of alcohol and 80 of water.

SPITHEAD, a road between Portſmouth and the Iſle of Wight, where the royal navy of Great Britain frequently rendezvous.

SPITTLE, in physiology. See Saliva. SPITZBERGEN. See Greenland, n⁰ 10. SPLACHNUM, in botany : A genus of plants be­longing to the claſs of *cryptogamia,* and order of *muſci.* The antheræ are cylindrical, and grow on a large co­loured apophyſis or umbraculum. The calyptra is ca­ducous. The female ſtar grows on a ſeparate ſtera. There are six ſpecies, the rubrum, luteum, sphæricum, ampullaceum, vaſculoſum, anguſtatum. Two of theſe are natives of Britain.

1. The *ampullaceum,* or crewet ſplachnum, is found in bogs and marſhes, and often upon cow-dung. It grows in thick tufts, and is about two inches high. The leaves are oval lanceolate, terminated with a long point or beard. The top of the filament or peduncle ſwells into the form of an inverted cone, which Linnæus terms an *apοphysis* or *umbraculum ;* upon the top of which is placed a cylindrical anthera, like the neck of a crewet. The calyptra is conical, and reſembles a ſmall extinguiſher.

2. The *vaſculoſum,* or acorn-ſhaped ſplachnum, is found upon bogs and cow-dung, and upon the points of