**But a much** greater and more **uncertain** correction is neceſſary on account of the variation of the diſſolving power of water by heat. This indeed is very ſmall in the caſe of ſea-ſalt in compariſon with other ſalts. We preſume that our readers are appriſed of this peculiarity of ſea-ſalt, that it diſſolves nearly in equal quantities in hot or in cold water. But although water of the tem­perature 60 will not diſſolve more than 320 or 325 ounces of the pureſt and dryeſt ſea-ſalt, it will take up above 20 ounces more by boiling on it. When thus ſaturated to the utmoſt, and allowed to cool, it does not quit any of it till it is far cooled, viz. near to 60⁰. It then depoſits this redundant ſalt, and holds the rest till it is juſt going to freeze, when it lets it go in the inſtant of freezing. If evaporated in the ſtate in which it continues to hold the ſalt, it will yield above 400 ounces per cubic foot of brine, in good cryſtals, but ra­ther overcharged with water. And ſince in this ſtate the cubic foot of brine weighs about 1220 ounces, it follows, that 820 ounces of water will, by boiling, diſsolve 400 of cryſtallized ſalt.

The table ſhows how much any brine muſt be boiled down in order to grain. Having obſerved its ſpecific gra­vity, find in the table the quantity of ſalt correſponding. Call this x. Then, ſince a boiling hot graining or ſatu­rated ſolution contains 340 ounces in the cubic foot of

brine, ſay 340 : 1000 = x : 1000/340*.* This is the bulk

to which every cubic foot (valued at 1000) muſt be boiled down. Thus ſuppoſe the brine has the ſpecific gravity 1109. It holds 160 ounces *per* foot, and we

muſt boil it down to 1000 x 160/340 or 471 ; that is, we

muſt boil off 529/1000 of every cubic foot or gallon.

Theſe remarks are of importance in the manufacture of common ſalt ; they enable us to appretiate the va­lue of ſalt ſprings, and to know how far it may be pru­dent to engage in the manufacture. For the doctrine of latent heat aſſures us, that in order to boil off a cer­tain quantity of water, a certain quantity of heat is indepenſably neceſſary. After the moſt judicious appli­cation of this heat, the conſumption of fuel may be too expenſive.

The ſpecific gravity of ſea-water in theſe climates does not exceed 1,03, or the cubic foot weighs 1030 ounces, and it contains about 41 ounces of ſalt. The brine- pits in England are vaſtly richer ; but in many parts of the world brines are boiled for ſalt which do not con­tain above 10 or 20 ounces in the cubic foot.

In buying ſalt by weight, it is of importance to know the degree of humidity. A ſalt will appear pretty dry (if free from magneſia ſalts) though moiſtened with 1 *per cent,* of water ; and it is found that incipient humidity expoſes it much to farther deliqueſcence. A much ſmaller degree of humidity may be dis­covered by the ſpecific gravity of a brine made with a few ounces of the ſalt. And the inſpection of the table informs us that the brine ſhould be weak ; for the dif­ferences of ſpecific gravity go on diminiſhing in the stronger brines : 300 ounces of dry ſalt diſſolved in 897 ounces of water ſhould give the ſpecific gravity 1197. Suppoſe it be but 1190, the quantity of ſalt correſponding is only 290; but when mixed with 897 o**unces of water, the weight is 1197, although the** weight of the cubic foot is only 1190. There is there­fore more than a cubic foot of the brine, and there is as much ſalt as will make more than a cubic foot of the

weight 1190. There is 290 x 1197/1190, or 2912/3 ounces,

and there is 81/3 ounces of water attached to the ſalt.

The various informations wlιich we have pointed out as deducible from a knowledge of the specific gravity of the brines of common salt, will ſerve to ſuggeſt ſeveral advantages of the knowledge of this circumſtance in other lixivia. We ſhall not therefore reſume them, but ſimply give another table or two of ſuch as are moſt intereſting. Of thoſe alkaline leys are the chief, being of extenſive uſe in bleaching, ſoap-making, glaſs-making, &c.

We therefore made a very ſtrong ley of the pureſt vegetable alkali that is ever uſed in the manufactories, not thinking it neceſſary, or even proper, to take it in its ſtate of utmoſt purity, as obtained from cubic nitre and the like. We took ſalt of tartar from the apothecary, perfectly dry, of which 3983 grains were diſſolved in 3540 grains of distilled water ; and after agitation for ſeveral days, and then ſtanding to deposit ſediment, the clear ley was decanted. It was again agitated ; becauſe, when of this ſtrength, it becomes, in a very ſhort time, rarer above and denſer at the bottom. A flaſk containing 4200 grains of water held 6165 of this ley when of the temperature 55⁰. Its ſpecific gravity was therefore 1,4678, and the 6165 grains of ley contained 3264 grain of ſalt. We examined its ſpecific gravity in diffe­rent ſtates of dilution, till we came to a brine containing 51 grains of ſalt, and 4189 grains of water, and the con­tents of the flaſk weighed 4240 grains : its ſpecific gravity was therefore 1,0095. In this train of expe­riments the progreſſion was moſt regular and ſatisfactory ; ſo that when we conſtructed the curve of ſpecific gravities geometrically, none of the points deviated from a moſt regular curve. It was conſiderably more incurvated near its commencement than the curve for ſea-ſalt, indicating a much greater condenſation in the diluted brines. We think that the following table, conſtructed in the ſame manner as that for common ſalt, may be de­pended on as very exact.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weight  of | Salt | W eight of | Salt | Weight of | Salt |
| Cub.Foot | cont. | Cub. Foot | cont. | Cub.Foot | cont. |
| oz. | oz. | oz. | oz. | oz. | oz. |
| 1000 | 0 | 1224 | 340 | 1417 | 680 |
| 1016 | 20 | 1236 | 360 | 1428 | 700 |
| 1031 | 40 | 1248 | 380 | 1438 | 720 |
| 1045 | 60 | 1259 | 400 | 1449 | 740 |
| 1058 | 80 | 1270 | 420 | 1460 | 760 |
| 1071 | 100 | 1281 | 440 | 1471 | 780 |
| 1084 | 120 | 1293 | 460 | 1482 | 800 |
| 1098 | 140 | 1305 | 480 | 1493 | 820 |
| 1112 | l60 | 1317 | 500 | 1504 | 840 |
| 1125 | l80 | 1329 | 520 | 1515 | 860 |
| 1138 | 200 | 1340 | 540 | 1526 | 880 |
| 1150 | 220 | 1351 | 500 | 1537 | 900 |
| 1162 | 240 | 1362 | 580 | 1547 | 920 |
| 1174 | 260 | 1372 | 600 | 1557 | 940 |
| 1187 | 280 | 1384 | 620 | 1567 | 960 |
| 1200 | 300 | 1395 | 640 | 1577 | 980 |
| 1212 | 320 | 1406 | 660 | 1586 | 1000 |