through the ſurface of the earth, makes its way into certain cavities, and thence issues out in the form of ſprings ; becauſe the waters of ſeveral are found to increaſe and diminiſh in proportion to the rain which falls : that others again, eſpecially ſuch as are ſalt, and ſpring near the ſea-ſhore, owe their origin to sea-water perco­lated through the earth ; and ſome to both theſe cauſes: though without doubt most of them, and especially ſuch as ſpring near the tops of high mountains, receive their waters from vapours, as before explained.

This reaſoning of Dr Halley’s is confirmed by more recent obſervations and diſcoveries. It is now found, that though water is a tolerable conductor of the electric fluid, dry earth is an electric *per ſe,* conſequently the dry land muſt always be in an electrified ſtate compared with the ocean, unleſs in ſuch particuler caſes as are mentioned under the article Earth­quake, n⁰ 82. It is also well known, that ſuch bodies as are in an electrified ſtate, whether plus or *minus,* will attract vapour, or other light ſubſtances that came near them. Hence the vapours that are raised from the ocean muſt neceſſarily have a tendency to approach the land in great quantity, even without the aſſiſtance of the wind, though this laſt muſt undoubtedly contribute greatly towards the ſame purpoſe, as Dr Halley juſtly obſerves. In like manner, the higher grounds are al­ways in a more electrified ſtate than the lower ones : and hence the vapours having once left the ocean and approached the ſhore,are attracted by the high moun­tains , of which Mr Pennant gives an inſtance in Snow­don. Hence we may ſee the reaſon why ſprings are ſo common in the neighbourhood of mountains, they be­ing ſo advantageouſly formed in every reſpect for col­lecting and condensing the vapours into water.

The heat of ſprings is generally the ſame with the mean temperature of the atmoſphere. The mean temperature of the ſouth of England is 48⁰ ; in Scotland, near Edinburgh, it is 45⁰ ; in the north of Ireland it is 48⁰, and on the ſouth coaſt about 51⁰. At Upſal, in Sweden, it is 43⁰, and in Paris 53⁰. According to accurate experiments made by eminent philoſophers, the heat of the ſprings in theſe different countries correſponds with the medium tem­perature. We have not heard that ſimilar experiments have been made in other countries, or we ſhould have been careful to collect them. We do not, however, doubt but they have been made in moſt countries of Europe ; yet we ſuſpect little attention has been paid to this ſubject within the tropical regions.

Though this coincidence of the heat of ſprings with the mean temperature of the climate where they flow, ſeems to be a general fact, yet it admits of many ex­ceptions. In many parts of the world there are ſprings which not only exceed the mean temperature, but even the ſtrongeſt meridian heat ever known in the torrid regions. The following table will give a diſtinct notion of the degrees of heat which different ſprings have been found to poſſeſs, according to the experiments of phi­loſophers. It is necessary to remark, that experiments made upon the ſame ſprings, made by different perſons, vary a little from one another, which may be owing to many accidents eaſily accounted for. Where this is the caſe, we ſhall mention both the loweſt and higheſt degree of heat which has been aſcribed to the ſame ſpring, according to Fahrenheit's thermometer.

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| Places. | Springs. | Higheſt degree of heat. | Loweſt degree of heat. |
| Briſtol, | St Vincent’s or the hot well, | 84 | 76 |
| Buxton, | Gentleman’s bath, | 82 |  |
| Matlock, |  | 69 |  |
| Bath, | King’s bath, | 119 | 113 |
| Aix-la-Chapelle, |  | I 46 | 136 |
| Barege, |  | I 22 |  |
| Piſa, |  | 104 |  |
| Caroline baths in Bohemia, | Prudel or furi­ous, | 165 |  |
| Iceland, | Geyzer, | 212 |  |

In cold countries, where congelation takes place, the heat of the earth is conſiderably above the freezing point, and continues ſo through the whole year. From experiments that have been made in mines and deep pits, it appears that this heat is uniform and ſtationary at a certain depth. But as the heat of theſe ſprings far exceeds the common heat of the internal parts of the earth, it muſt be occasioned by cauſes peculiar to certain places ; but what theſe cauſes are it is no eaſy mat­ter to determine. We are certain, indeed, that hot ſprings receive their heat from ſome ſubterranean cauſe; but it is a matter of difficulty to inveſtigate how this heat is produced and preſerved. Theories, however, have been formed on this subject. the ſubterranean heat has been aſcribed to the electrical fluid, and to a great body of fire in the centre of the earth : But we ſuſpect that the nature of the electrical fluid and its ef­fects are not ſufficiently understood. As to the ſuppoſition that the heat of ſprings is owing to a central fire, it is too hypothetical to require any refutation. From what then does this heat originate, and whence is the fuel which has produced it for so many ages ? To enable us to anſwer theſe queſtions with precision, more information is necessary than we have hitherto obtained reſpecting the ſtructure of the internal parts of the earth. It is peculiarly requiſite that we ſhould be made acquainted with the foſſils which are moſt common in those places where hot ſprings abound. We ſhould then perhaps diſcover that hot ſprings always paſs thro' bodies of a combuſtible nature. It is well known to chemiſts, that when water is mixed with the vitriolic acid, a degree of heat is produced ſuperior to that of boiling water. It is also an eſtabliſhed fact, that when water meets with pyrites, that is, a mixture of ſulphur and iron, a violent inflammation takes place. If, there­fore, we could prove that theſe materials exiſt in the ſtrata from which hot ſprings are derived, we ſhould be en­abled to give a satisfactory account of this curious pheno­menon. As ſome apology for this ſuppoſition, we may­ add, that moſt of the hot ſprings mentioned above have been found by analyſis to be impregnated with ſulphur, and ſome of them with iron. It muſt, however, be ac­knowledged, that the hot ſprings of Iceland, which are 112⁰, the heat of boiling water, according to an accurate analyſis of their contents by the ingenious Dr Black, were neither found to contain iron nor ſulphur. It will therefore, perhaps, be necessary that we ſhould wait with patience, and continue to collect facts, till the ſciences of chemiſtry and mineralogy ſhall be ſo far ad­vanced as to enable us to form a permanent theory on this ſubject.

Springs are of different kinds. Seme are perennial,