

fible the Map of the Province of *Peking*, by Father *Martini* called *Pekeli*, and by the *Chinese Tcheli* or *Lipafou*. I am, &c.

J A R T O U X.

XXVI. *An Examen of the Chalybeat, or Spa-Waters, called by the Germans Acid or Sowre-Brunns, or Fountains; but prov'd to be of a contrary Nature, that is, Alkali's. By Dr. Fred. Slare, Fellow of the Coll. of Physicians and Royal Society.*

I Have, for many Years past, had more than a bare Suspicion, that Physicians and Learned Persons had impos'd upon themselves and others Erroneous Notions about the Nature and Properties of those Mineral Waters, which are of the *Chalybeat* or Iron Species. *Germany* abounds much with these Waters, and they bestow one general Name upon them, and call them *Sowre Brunns*, that is, sower Wells or Springs of Water. The Learned *Germans*, when they name them, or write of them, do call them *Acidulae*, ex. *Gr. Spadenses, Smalbaccenses vel Pyromontanae, &c.* *Henricus ab Heers* agrees with *Vitruvius, Fallopius*, and the Sagacious *Helmont*, and other Men of great Fame, in justifying the Acidity of the several sorts of *Spa* and *Chalibeat* Waters; but, not being satisfied with their Reasons, assigns others; and after a tedious and obscure Harangue, concludes, That they owe their Birth and great Virtues to Vitriol and Sulphur. He observes, that Vitriol and Sulphur are found in the Globe or Earth, from whence these Waters do spring; but yet
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does not give us one Proof or Experiment of his having found any real Vitriol, or true Sulphur, or any Acidity in these Waters; but fills his Book with Imaginations, and Quotations, exposing other Mens Ignorance.

Dr. *Jordis*, a Fellow of the *Royal Society*, with whom I kept a Correspondence for above thirty Years past, practis'd Physick at *Francford*, and often at *Swalbac* in Summer-time: I desired him to examine those Waters, and give me an account of the Contents of that *Sowr-Brunn* or *Acidula* (so much celebrated for its Virtues, and Concourse of Persons of the greatest Quality.) He gave me an Account of some *Ocres*, or Ferrugineous Parts, which he calcin'd and tortur'd in the Fire, to make them confess their Sulphur Original; but in all his Experiments did not satisfy me that the Water held one Drop of an Acid by Distillation, &c.

That which gave me the first Suspicion, that the *Chalybeat* Waters did not contain any rough, or Vitriolic, or Acid Salts in them, proceeded from an accidental Use of a strong Iron Water, in which I dissolved Soap, and found it lather and wash my Hands well, and then I us'd a Wash-ball and shav'd with it; and try'd several other Waters of this sort, which did the same, and much better than some Pump-Waters.

I. I consulted my Palate, and try'd whether I could discover any Sharpness or Acidity in our *English* Steel-Waters at *Tunbridge*, at *Black-Boy* in the Parish of *Franfield* in *Sussex*, *Hampsted*, *Sunning hill* in *Berkshire*, &c. but I was so far from discovering any such Thing, that these Waters seem'd rather to leave a sweetish Flavour or farewell behind: Thus many Alkaly Salts, if nicely examin'd (of the fix'd kind) have affected my Taste.

II. I made Experiments with several sorts of such Spirits as are apt to ferment with Acids; such as Spirit of *Hart's-horn*, of *Sal Armoniac*, &c. but these made no Ferment,

Ferment, nor any Motion or Change in these Waters.

III. I consider'd the Diseases in Human Bodies, which these Waters were prescrib'd, by Physicians, to cure; that they were often such as proceeded from Sharp, Acid, or Acrimonious Causes, as *Cardialgie* or Heart-burnings, sower Vomitings, Corrosive *Diarrhæa's*, Colicks from Scurvies and Stranguries; and that for these Distempers sweetning and Alkalifate Remedies are made use of.

IV. I consider these Waters as containing in them the Properties of Iron; and I find by experience, that it is most opposite to Acids, being one of their great Correctors, and therefore rather to be esteemed an Alkali.

1. Take some filings of Iron, perhaps a Dram, and pour on them about an Ounce of the milder Acids, such as Vinegar, Verjuice, or the Juice of Lemons, and it will destroy the sharpness of these Juices: Or if you pour on these filings Mineral Acids, as the very corrosive Spirit of Nitre, or of Salt, or what is call'd Oil of Vitriol, they will immediately lose their Acidity, be disarm'd of their sharp Points, and by Evaporation give a Salt that will taste sweetish, and is by Chymists call'd *Saccharum Martis*, if duly prepared; which is safely given inwardly, and is esteemed a good altering Medicine.

2. Steel beaten to a fine Powder is, without any farther Preparation, given inwardly with great Success for Stomachic Diseases, as in the Green-Sickness, Hypochondriac and various other Acid and Acrimonious Disaffections.

V. I consider'd Milk to be a very proper and obvious Subject to bring this Controversy to a plain and unquestionable decision. I made this Experiment with all possible exactness: I first prov'd the Chalybeat Waters, more particularly the Spaw-Waters, by trying whether

they tinged with Galls. These being very good, I put part of the Waters to cold Milk; some I only made lukewarm, and some I boil'd together, in equal proportions: But they were so far from affording any Curd or Coagulation, that they continued several Days without being sour.

Since Mineral Waters, especially those that are Chalybeate, are of such important use in Physick, and have gain'd amongst us so just a Reputation for their excellent Virtues, and are the greatest refuge in very potent and obstinate Diseases; this has made me judge it a work not unacceptable to Virtuoso's, especially those of the faculty of Physick, to have this Medicine fairly examin'd, its genuine Properties asserted, and what was call'd an Acid to be demonstrated an *Alkali*. Is it not a sort of Justice due to the World, that the *Germans*, who sent us over these Waters, with this false Character of Sower Waters, should banish this misguiding Term from their *Spa's*?

It is from this mistake, that their Physicians do prohibit the use of all manner of *Lactinia*, as if they were as noxious as deadly Poisons, whilst they are in a course of their Medicinal Waters.

Since this prejudice has prevail'd very much amongst most of our Water Drinkers in *England*, I do attest that I have frequently advis'd, in some Cases, Milk to be given daily in the Evening, thro' a whole course of Steel-Waters, with good Effect: Nay, I do affirm, that some others could not bear the Waters without having a third part of Milk or more mix'd with 'em, and have continued 'em so for many Weeks with good advantage: Nor do I find the least reason to prohibit the use of Milk in a course of *Bath Waters*, having been here above a Year and half, making the best Scrutiny I can into the Properties, Virtues, and Vices (if they have any) of these Waters: But of these Waters I may probably give some Account hereafter,

VI. Since our Experiments discover, that those Things which are of a sweetning *Alkalifate* Nature, do so very well agree with these Mineral Waters, it will appear by the following Experiment that *Acids* do very much disagree.

1. I put but one drop of Oil of Vitriol to a large Glass full of strong *Spa-Waters*, which before the addition of this *Acid* did give a deep purple to the Solution of Galls; but now would not give the least Tincture, tho' I put in four times as much of the Galls: From hence I conclude, that the Virtues of the *Chalybeat* Ingredients, which I take to be the Life and Soul of these Waters, were so far bound up or destroy'd as to have lost their Cordial or corroborating Faculty; and that the Bile or Gall in the Humane Bowels could not be able to separate the *Chalybeat* (which are the only Medical) Particles, and mix them with the Chyle, in order to answer any End in Physick.

Let this be a caution to those that design to make these Waters pass better by Urine, that they do not make use of any *Acids*; it being a common Practice to use Spirit of Vitriol, *Spiritus Nitri dulcis*, &c. as a Diuretick: Unless it should so happen that they have a design to take off, and divest them of their warm cordial or altering Power, and so to bring them near to common Water; which I must confess we are forc'd to do, especially in the use of *Bath Waters*, in some hot Inflammatory Cases.

2. I shall conclude with one short Experiment in favour of our *Alkalis*; That if you put any *Alkali* Salt, volatile or fix'd, such as Volatile Salt of Hartshorn, or of *Sal Armoniac*, or fix'd Salt of *Tartar*, of Wormwood, or any other true *Alkali*, you will then destroy the above-nam'd Acid Spirit, recover the virtue of the Waters, and dispose them to give their Tincture as they used to do in their Natural State.