

PHILOSOPHICAL TRANSACTIONS.

July 19. 1669.

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Observations

Concerning the Bath-Springs, communicated by Mr. Joseph Glanvill, in a Letter to the Publisher dated June 16. 1669: at the Bath.

Sir, I Have now made the most carefull Inquiry, I can, concerning our Baths; and have these particulars to return to you in answer to your *Queries*.

1. The Country round this Citty is very hilly and uneven;
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but the Hills lye in no order; they are generally rocky and steepe from South-west and by West, to North and by North: th, whole Tract of the Country, within 5. and 7. miles, abounds with Coal-mines, more or less. But there are no other considerable Mines, that I can hear of, nearer then *Mendip*, which is 10. miles hence, excepting some of Lead at *Berry* in *Glocester-shire*, which lyes up on the North of this place, about 4. or 5. miles distant.

2. The Hills for the most part afford a Free-stone; and on the North-west of *Lansdown* (which hath that situation to the Town, and is just above it) the Stones, digg'd there, are a sort of hard stone, commonly call'd a *Lyas*, blue and white, polishable.

3. The Town and Baths are of very great Antiquity. Besides what I find in very ancient Chronicles to that purpose, one of our great Antiquaries (Mr. P.) asserts, that these Baths were 800. years before Christ. Which if so, would give occasion to inquire, how consistent with it that *Hypothesis*, concerning the Cause of the Heat of these Waters, would be, which makes it to be the Fermentation of Minerals in *feri*; and, whether it be likely, that the Minerals, through which these waters pass, should be in that state of imperfection so many hundred-years, and that the whole dispos'd matter in those places should not be perfectly concreted in so great a Tract of time. You doubtless know the other conjecture, which supposeth the cause of this heat to be, That two streames having run through and imbibed certain sorts of different Minerals, meet at last, after they have been deeply impregnated, and mingle their liquors, from which commixture arises a great fermentation, that causes heat; like as we see it is in *Vitriol* and *Tartar*, which though separately they are not hot, yet when mingled beget an intense heat and ebullition between them. This seems to me a probable cause of the lastingness of the heat of these waters. But it is not my business to offer *Hypotheses*; therefore craving pardon for this digression, I proceed in my Account.

4. It is affirm'd here, that the Town for the most part is built upon a Quag-mire, though the places all about it are very firm ground. Some workmen, that have been employ'd in digging,
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have found a mire ten foot deep: without the North-gate, the highest place of the Town, at heaven. The Earth between is a kind of rubbish; sometimes they find pitching a mans length under ground, and passages for the water to pass: 7. or 8. foot down they have met with *Oyster-shells*.

5. The Town and Country circumjacent, generally abound with cold Springs: and in some places the hot and cold arise very near each other; in one place, within two yards, and in others, within 8. or 9. of the main Bathes.

6. The Guides of the *Cross-Bath* informe me, that, when there is a great West-wind abroad, standing by the Springs they feel a cold air arising from beneath: if the Wind be at East, and the morning close with a little missing rain, the *Cross-Bath* is so hot as scarce to be endur'd, when the *Kings*-and *Hot-Baths* are colder than usual. In other winds let the weather be how it will, this Bath is temperate. The Springs that bubble most are coldest. The *Cross-Bath* fills in 16. hours, both in Winter and Summer, without any difference from heat or cold, floods or drought. That of the *Kings*, in 12. or 14.

7. A man may better (ordinarily) endure 4. hours bathing in the *Cross-bath*, than 1½ in the others. In the *Queens Bath* (which hath no Springs of its own; but comes all out of the *Kings*) they have found under a flat stone, which upon occasion was taken up, a Tunnel, and a yeelding mudd in and under it, into which they thrust a pike, but could feel no bottom. In the *Kings-bath* there is a Spring so hot, that it is scarce sufferable, so that they are fain to turn much of it away, for fear of inflaming the Bath. The hottest Spring will not harden an Egge.

8. The Bath-water does not pass through the body like other Minerall waters; but if you put in Salt, it purgeth presently. Upon settlement it affords a black mudd, usefull in aitches, applyed by way of *Cataplasm*; to some more successful then the very waters. The like it deposits upon Distillation, and no other. Nor hath any more been discover'd upon all the Chymical examinations, that have come to our knowledge. One Dr *Astendoff* found, that the colour of the Salt, drawn from the *Kings*-and *Hot-bath*, was yellow; that, which was

extracted from the *Cross-bath*, white. This Doctor concluded, that the *Cross-bath* had more of *Allum* and *Niter*, than the hotter Bathes, which abound more with *Sulphur*. And yet that Bath loosens shrunk sinews, by which it should seem it abounds not much with *Allum*. It is harsher to the taste than the other Baths, and soaks the hands more.

9. A man cannot drink half the quantity of strong drinks in the Bath, that he can out of it; but if he hath drank before to excess, it allays much, and is a great refreshment to the body. The Bath provoketh Urine.

10. They are very usefull in diseases of the Head; Palsies, Epilepsies and Convulsions: In Cuticular diseases, Leprosies, Itches and Scabbs: In all Obstructions of the Bowels, as Spleen, Liver, and Mesentery; and the scirrosity and hardness of those parts: In most diseases of Women; In the Scurvey and Stone: as to which last, while I am writing, an Alderman of the City assures me, that his Wife, who had been exceedingly troubled with the Stone, went into the *Cross-bath* for it, and voided there several stones as bigg as those of Olives, and was never troubled with that distemper after. The Bath is also good in cold Gouts, as they call them. The same Alderman tells me, that it gives him present ease, when he is troubled with the fits of it. He uses to goe in, as soon as the fit takes him, which then goes off presently, and returns not in a considerable time after: He puts his feet upon the hottest springs in the *Kings-Bath*. But it hath a contrary effect in hott Gouts; and some, who are troubled with that distemper, tell me, that the Bath puts them into a fit, if they goe into it without preparation; or, if they have the fit before, it inflames it more, and sends it about the body, and disables the Joynt so, that there is no treading on it for the present. Further, the Bath is effectuell in the diseases of Children, particularly the *Rickets*, removing the humors, that proceed from it, without faile. 'Tis also good for Women, that are apt to miscarry, if us'd moderately. The Bath guides goe in, when they are ready to lye down; and other woe-men of the Town use it ordinarily throughout their time, and are never observed to miscarry. It facilitates deliverance. Besides, it is very effectuell for the strengthening of broken Bones, and
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good in all cold and moist distempers and weakness of Nerves, Stupefactions, Relaxations, and violent Pains: in all which it gives ease, except the *Lues Venerea*: for in that (except the malignity be overcome by the methods of Physick) it exasperates the pain more. 'Tis an excellent remedy to remove the remaining weakness in Gouts, as hath been remarkably exemplified in old men, even to the age of 83. years.

11. There is no instance of Cures perform'd by it in former times, but we have experience of the same in ours; yea and in some others, as in Dropsies, Cachexies, Spleen &c. In which cases they were shy heretofore of using the Bath, for fear of confirming those Obstructions, whereas 'tis now found, that their Cure is facilitated by it.

12. The Bath-guides live to a very great age, sometimes to near 100. years; ordinarily, if they are temperate, to 70. There are two at this time above 80, a man and his wife.

13. In the *Cross bath* the Guides have observed a certain black Fly with sealed wings, in the form of a *Lady-cow*, but somewhat bigger. They say, it shoots quick in the water, and sometimes bites. It lives under the water, and is never found but in very hot weather: They suppose, it comes up with the Springs. It is not to be seen elsewhere. I had one of those Insects sent me last year, which I preserv'd till I came to *London*, intending to have given it you; but I know not, how I lost it there.

14. The *Cross-bath* eats out silver exceedingly; and I am told, that a shilling in a weeks time hath been so eaten by it, that it might be wound about one's finger. The Baths agree (as the vulgar speaks) with Brass, but not with Iron: for, they will eat out a ring of *this* metall in 7. years, when Brass-rings seem to receive no prejudice at all from it.

15. When Women have wash't their hair with the mixture of beaten eggs and oatmeal, this will poison the Bath so, as to beget a most noisome smell, casting a sea-green on the water, which otherwise is very pure and limpid. This will taint the very walls, and there is no cleansing of it, but by drawing the Bath.

16. In Summer the Baths purge up a green scum on the top, but in Winter never; but then leave a yellow on the Walls.

17. The

17. The Walls that keep in the hot Springs are very deep-set, and large; 10. foot thick, and 14. deep from the level of the street. The cement of the wall is tallow, clay, lime and beaten bricks. In the year 1659. the *Hot-bath* (a Bath particularly so call'd, of equall heat with the *Kings-bath*) was much impaired by the breaking out of a Spring, which the workmen at last found again, and restored. In digging they came to a firm foundation of factitious matter, which had holes in it like a Pumice-stone, through which the water played; so that 'tis like the Springs are brought together by Art: which probably was the Necromancy, the people of antient times believed and reported to have contrived and made these Baths; as in a very antient manuscript Chronicle I find these words: *When Lud Hidibras was dead, Bladud his Son, a great Nygromancer (so 'tis there writ) was made King, and he made the wonder of the hot Bath by his Nygromancy, and he reigned 21. years, and after he died, and lyes at the new Troy.* And in another old Chronicle 'tis said, *That King Bladud sent for Necromancers to Athens to effect this great business,* who 'tis like were no other then cunning Artificers, well skill'd in Architecture and Mechanicks.

18. It hath been observ'd, that leaves, like those of Olives, come sometimes out of the Pump of the *Hot-Bath*.

These, Sir, are all the Observations I have been able to collect yet: if any thing else material shall hereafter come to my knowledge about these matters, I shall not fail to impart them, God permitting. Perhaps these things may administer occasion to more Questions relating to the Bath, and their *Phanomena*. If you or any other ingenious person of the R. Society shall propose any to me, I shall take what care I can to have them punctually answer'd. I am &c.

Extract of a Letter,

Written by Mr. Muraltus of Zurich, to M. Haak, a Fellow of the R. Society, concerning the Icy and Chrystallin Mountains of Helvetia, call'd the Gletscher. English'd out of Latin by the Publisher, as follows;

THe highest Jcy Mountains of *Helvetia* about *Valesia* and *Augusta*, in the Canton of *Bern*; about *Taminium* and *Tavetsch* of the *Rhatians*, are alwayes seen cover'd with Snow