

known to every Plowman; what I further add, I wish were so to every Gentleman, that by the Marriage of these Male and Female Salts, they might enrich both their Country and themselves. The Sea-Salt is too lusty and active of it self, the Lime has a more Balsamick, but gentler Salt; and regularly joined with the other, is thereby invigorated. How to match these two, Glauber thus directs. *Take (says he) Quick-Lime, let it slack by time without Water; then take Salt and Water, mingle them together, and make them into Balls or Pieces, which you please; dry 'em as you do Bricks, then burn them for about two Hours. This Compost will enrich your poorest Land.*

Were I so devoted to Agriculture, as you suppose, I should remove my Dwelling to such a Situation, as were best accommodated with these three, Lime, Salt, and Coals; and did our Gentry understand this Husbandry, they would so far free Salt from its Tax, as it should be employed upon Land, which is not intended to pay for it.

VI. *A Letter from Mr. Edward Lhuys, Keeper of the Ashmolean Museum in Oxford, to Dr. R.R. in Yorkshire; giving an Account of a Book, Entitled, OYPEΣIΘOITHΣ Helveticus, sive Itinera Alpina Tria, &c. Authore Joh. Ja. Scheuchzer, M. D. Lond. 4to. MDCCVIII.*

Honoured Sir,

HAVING had the Favour of a Perusal of Dr. Scheuchzer's *Itinera Alpina*, as the Sheets were printed off, I take an Opportunity offer'd by a Friend, of sending you some Account of Part of that very Learned and Ingenious

genious Gentleman's Observations; because all the Plates being not yet Engraven, it may be some time e're the Book is publish'd; and in regard nothing else occurs at present, that I can suppose so acceptable, or indeed worth sending.

What chiefly falls under his Consideration is the Nature of the Alpine Waters and Meteors; the Height, &c. of the Mountains, and the most Remarkable Minerals and Plants they afford. He has also some Occasional Observations on Animals; and others in the Practice of Physick, and on the Customs and Diet of the Inhabitants; together with some Instances of the Superstition of the Common People, and a few Notes relating to Antiquities. Any of these Subjects he takes notice of, after the manner of other Journals, as they occur; but having now read the Sheets all over, and seen several of the Tables, the Account I send, tho' imperfect, is according to these General Heads.

First as to the ALPINE WATERS; Besides those which are Medicinal, he has several Observations on the Rivers and Brooks. The *Rhine* he affirms to have changed its old Course, between *Roncaolia* and the DISTRICT OF SCHAMS. *As for the Valley* (says he) of *La Via mala*; *If we may not suppose it to have been anciently at the lower end unopen; we must of necessity allow it to have been gradually one Age after another considerably depress'd, by the Impetuous Current of the Latter Rhine. 'Tis most certain, and from the Track of the Water which has polish'd the Stones, demonstrable; that very anciently (we may perhaps suppose it in the First Ages after the Deluge) the Course of the Rhine was along La Via mala, whereas it now runs thro' Deep Caverns and Clefts of Rocks about 200 Foot below that Road.* The like Observation is also made by Mr. *Colweck* on the Course of the *Taminna*, which runs by the *Pepper Bath*, in his *German Treatise* of those Waters; but our Author judges it a difficult Experiment, if at all practi-

practicable, to make any Computation of the Depth a Valley sinks in a Century, by marking Yearly the Height of the Water on the Stones in the narrow Passages of the Mountains; because of the Annual and even Daily Variations of the Quantity and Force of Water, which depends on the Quantity of Rain, as also of melted Snow and Ice; as likewise of the Resistance made by Stones and Trees eradicated by the Torrents.

Betwixt *Andera* and *Spelunca* he takes notice of the frequent Catarrhaets on the *Rhine*, where the Foaming Waters are to dash'd against the Rocky Precipices, that the adjoining Cliffs are thereby continually Water'd, nor do the Travellers always escape, One of these, being that which seem'd most Remarkable, he gives us a Draught of, in the 8th Table of his *Second Journey*. These Catarrhaets are also not uncommon in the Territory of *ENGELBERG*, amongst which, that of *DEUSBACH*, over against the celebrated Mountain *TITLISBERG*, affords the pleafantest Prospect. It. 2. p. 30. But the most agreeable Cascade he met with in all his Travels, is on the River *Maira*, opposite to the Place where the Town of *Plurs* once stood, which is now only Fields and Meadows; that being the most Remarkable of any, for Breadth as well as Depth, which he computes to be about 100 Foot. The River having so Great a Fall, the neighbouring Fields are continually bedew'd with its constant sprinkling; and the Spectators become soon dropping wet; which inconveniency the Pleasant Prospect not only of the Catarrhaet, but also of a Circular Rainbow they stand in, makes such amends for, that 'tis not in the least regarded. Such Rainbows are also seen, at some Catarrhaets of the *Rhine*, as particularly that noted Waterfall at *LAUFF* in *ZURICH*, well describ'd by *Glareanus* in his *Panegyricon Helvetia*. It. 1. p. 27.

On the 23d of *August* he ascended *Monte di Sett*, or (as the Germans call it) *SETMERBERG*, which is part of the *Julian Alps*, to see on the top of it the celebrated Springs of three Rivers, at the distance of scarce twenty Perches: viz. those that flow Northward, constitute part of the *Rhine*; those on the South West, the River *Maira*, which runs through *BERGEL* and *Clavenna*; and those on the East, the *Aqua de Pila*. But the Mountain about the Springs being all cover'd with Snow, his Curiosity was satisfy'd with the *Alpine* Plants and some other Rarities that occur'd. This Observation may be parallell'd in the Origin of divers of our own Rivers; as particularly of the *Severn*, the *Wye* and *Rheidol* at *Pymlymon* on the Confines of *Mongomery* and *Cardiganshire*, and

Several other Places on the Mountains of *Wales* and *Scotland*. But 'tis to be observ'd, that as it is not one Spring that makes any considerable Brook, much less a large River; so no Rivulet carries the Name of the River it flows into, to the Fountain Head; the Names the Rivers are distinguish'd by, being given to the Confluence of divers Rivulets in the Lower Valleys; where if they form a Lake, as they very often do, that Lake is most commonly, not to say always, denominat'd from the River; and not, as some contend, the Rivers from their Lakes. The reason of which is, that the Inhabitants on the Rivers, found it necessary to give them Names, more early than to the Mountain Lakes, which at the first Peopling of a Country, were known comparatively but to very few.

It. 2. p. 45.

But the most Remarkable Place our Author mentions for Springs, is the Town of *Flum*, which he says is thence denominat'd; the Word *Flum* signifying a River in the *Grison* Language. About half a Mile out of Town, there are most clear Springs, which break forth at the Foot of the Mountain, which immediately constitute Rapid Streams, and in the Village it self are reckon'd thirteen; where the Waters gush forth with a sort of noise, in Rivulets from half a Foot to two Foot broad. Some of these are Temporary, which the Inhabitants ascribe to the melted Ice and Snow; others Perennial, supplied from the Great *Hydrophylacia* in the Bowels of the Mountain. The most considerable of these Fountains is call'd the *Gorg*, quasi *Gurges*; which is a Perennial one, and of it self serves to turn a Mill. Another place is call'd *Furnash*, where four Rivulets spring within the Distance of eleven Feet. *Ily Davos* is also a Temporary Spring, but nothing so cold as the rest. *Whoever would be Curious* (says he) *to trace out the first Sources of these Fountains, in the very Bowels of the Earth, may receive some Light if he considers that the Town is situated at the Foot of the OBER ALP, which Mountain is not [as generally they are in the Alps] rais'd to a sharp Ridge; but compos'd of exceeding broad Rocks, such as have no Fissures, but are continued, after the manner of Alembick.* He compares it, he says, to an Alembick; because he is fully perswaded, that this *Phenomenon* ought to be conceiv'd in the same manner, as Distillation is commonly and easily explain'd: *viz.* that there are Aqueous Vapours rais'd in great plenty from the deep Bowels of the Mountain, to the Top, by means of Subterraneous Heat; and that they are (*quoad minimam partem*) exhal'd into Air; which meeting with the Rocks shut on

all

all sides, is condensed into Water; and that trickling down, stagnates in those great Cavities we call *Hydrophylacia*. whence afterwards by Subterraneous Natural Aqueducts, the Waters are convey'd to this Village, and those Neighbouring Places where we see them break forth. The Inhabitants are said to have made an Experiment to find out the Subterraneous Passage of the *Gorg*; which was, the casting down some Saw-Dust at a Cleft of the Mountain, towards the Top, where they heard the noise of running Water; and those who were left to watch below, found the Dust come out at the Spring. They pretend to distinguish some of those Waters from others as to Goodness, tho' our Author, upon Tryal, found them all of the same weight. The People that live here, tho' in all other Respects very lively and healthy, become sooner Gray and Bald pated than elsewhere; and this they all attribute to their drinking these Waters.

I must not here omit the giving you some Account of the *Alpine* Torrents, which do sometimes Incredible Damage in these Countries. These they call *BACHEN*, a Word agreeing with your Northern *BECK*; as their *BRUNNEN* [Springs] does with *BOURN*.

The First he takes notice of, is the *SPREITENBACH* at the *LESSE* *AUBRIG*; which often lays the Farms waste by its sudden Inundations. *The River Nolla*, says he, *which springs at the Foot of Beuerin Mountain, was so called by the Ancients, quasi Nolla, but in our Days it enlarges daily its Bounds; and is so Rapid and Destructive, that it often ruins whole Fields, Houses, and Stables.* It's easily distinguish'd in the *Rhine* from that River, by its Black Colour; which he attributes partly to the Swiftness of both Streams, but chiefly to the weight of the *Nolla*, by which it forces it self thro' the lighter Water of the *Rhine*. The Black Mud of the *Nolla*, which contains plenty of very small Cubical *Pyrites*, is the occasion of its Colour. At *Flims* he saw the Destruction wrought by a small Brook (a little before his coming) call'd, *Der* *BLAUNE*, which flowed with so much Violence from the abovementioned *OBERALP* Mountain, that breaking its Bank, and taking a new course, it almost ruin'd half the Town. The Houses were batter'd thro' by an Infinite number of Stones; Stables and Barns broken, and Rooms of dwelling Houses fill'd up with Mud, Earth and Gravel. Such a Flood they call *RUFIN*, where of one had happen'd at this Place before, in the Year 1687, and

another in 1572, when several Houses, and part of the Church, were batter'd down. But the most surprizing of all he mentions, is that at *NIDER URN*, which had almost destroy'd the whole Town. Of this, the Minister of the Place sent him the following Relation. " This Disaster happen'd (says he) on the 2d of *August*; which was a clear, calm Day. Towards the Evening the Sky seem'd to threaten Rain, but not so much to us as others; upon which I began to be concern'd for those of *MOLLIS*, and others of the higher Villages. There seem'd to be there and elsewhere a great Rain; tho' so tolerably clear with us, that we were rather in hopes 'twould soon be over, than apprehensive of Danger. But 'twas not long after, that our Sky was also cover'd with Black Clouds; and between the Hours of Six and Seven the Rain began to fall, not in Drops, but as if pour'd out of Pitchers; whence fearing, as well as others, some Mischief from our Brook, I began to run to a neighbouring Bridge; to assist at the removing it, but too late as well as others; for as soon as I got out of the House, I met the People in a great Consternation in the Grove adjoining, taking their Flight and forsaking their Houses and Streets for fear of the swelling River; making the best of their way to my House for their Security, and advising me either to flee quickly, or return. Whilst I was in this surprize, and returning home, the Flood begins to dash the Walls of the House, tho' remote enough from the Channel of the River; and to beat so hard at our Heels, that I could scarce shut the Door. Looking out at a Window, nothing appear'd in View, but a *Sky and Sea*, a Lake I mean, brought suddenly over the whole Town, breaking down Mounds, carrying away Timber and whatever else it met with; breaking in many places the Doors of Houses and Cellars; driving before it all Bridges, and in some place throwing down Walls. Destroying several Fruit Trees by rooting them up, and spoiling much more. The Seats were found swimming in the Church; the Buildings near the first Effort of the Flood, a Tucking and Grinding Mill (but such as were not inhabited) so entirely destroy'd, that there was not the least Track of them remaining. Some Men carry'd the feeble Women on their Shoulders to the higher Places; and many by avoiding one Danger fell into a worse; whilst leaving their Houses to flee elsewhere, they were oblig'd to climb Trees. The cause of so great and surprizing a Deluge, seems to have been a vast Storm

" in the higher Grounds mixt with Hail, which fell in such a quan-
 " tity on the Mountains of *Niderurn*, that there were Heaps of
 " them as high as Houses; wherein whole Fir-Trees, which the
 " Waters had eradicated, swam upright; whence so immense a
 " Quantity of Water collected in the *Alps*, after having ruin'd
 " the Mountain Pastures, was born down with such Violence,
 " rooting up Firs and other vast Trees, and rowling before it
 " Gravel and Stones. By this means the Channel of the Brook,
 " at the Foot of the Mountain, may be suppos'd to have been
 " stop'd for some time; whence breaking forth afterwards with
 " the greater force, and at unusual and deep Places, the fatal con-
 " sequence here describ'd naturally ensu'd.

The *Helvetian* and *Grison Alps* afford, it seems, no small number
 of Periodical Rivulets, such as our *Lambourn* in *Berkshire* de-
 scrib'd by the Poet *Sylvester* and Mr. *Hippisley**. These they call
MEYBRUNNEN or *May Springs*; one of which he met with in
 his First Journey, from its White Colour, call'd, *DER MILCH-*
BACH; which flows out of a Mountain Lake, call'd, *ALPELER*
S'EE LIN, only in the Months of *June* and *July*. Another he men-
 tions at *GRAFFENORTH*, betwixt the Abbey of *ENGELBERG*,
 and the Town of *WOLFFENSCHIES*, call'd from the extraordi-
 nary Coldness of the Water, *DER KALTE BRUNN*. This
 breaks out about the third *May*, and desists towards the middle of
tember. It was look'd upon as ominous, that in the Year 1700,
 it should continue to the Month of *October*. Another of the same
 sort, not far off, is call'd, *DER DURBRUNNEN*. In the Val-
 ley of *VATTISTHAL* he takes notice of two Brooks, call'd,
GORBSBACH, one whereof is about two, and the other three
 Foot over, at their first appearance out of the Rocks; whence he
 concludes, there must be some vast *Hydrophylacium*, or Natural
 Cistern in the Bowels of the Mountain. These, tho' they are not
 so call'd, observe the same Course with the *MEYBRUNNEN*;
 and in the 2d Table he has given us a Draught of the Mountain,
 and the issuing forth of these Springs. But the most celebrated,
 and particularly remarkable, is that of the Valley of *HASHTHAL*
 in *BERN*. This Fountain observes a double Course or Period; one
 Annual, and the other Diurnal or Horary. It flows only three
 Months, viz. from the midst of *May* to the midst of *August*;

* *Plot's Nat. Hist. of Staffordshire*, P. 57. Paragraph. 46.

but not (as the rest of the *METBRUNNEN*) continually : For generally it flows only about Eight in the Morning and Four in the Afternoon. But its Course, for what has been hitherto observ'd, is very Irregular. Sometimes the Water breaks forth in an Evening, and continuing all Night, ceases in the Morning ; at other times it resumes its Course in the Morning, and often recovers it at other times of the Day ; very often it runs three or four Days together ; and at other times for several Days no Water at all appears. He affirms the Water of their *Alps* in general to be exceeding light, insomuch, that tho' they are drunk plentifully, they do not in the least clog the Stomach, which is usually offend-

It. 2. p. 6.

ed by other Waters ; and this he Parallels with an Observation of Sir *Rebbert Sibbald's* of the Water of *Hois* in *Orkney*. Several of their Spring Waters when boil'd, turn of a whitish Colour, and precipitate a white Powder ; as particularly that of the *MEZG-BRUNNEN* at *LACHEN*, which is therefore thought impregnated with Alum.

It. 2. p. 7.

Having done with his Observations on the Rivers and Brooks, and Common Springs ; what remains, are those he has on the Mineral and Medicinal Waters. On the highest Plain of *Hacken*, he met with a cold Sulphureous Spring, encompassed with a Wall, and cover'd with Tiles for the use of Travellers ; who take large Draughts of the Water, without the least Inconveniency ; tho' it has a black clayey Earth, of a strong Sulphureous Scent.

It. 1. p. 7.

Not far from the Springs of the River *Oen*, are the Waters of *St Maurice*, so much frequented by the *Grisons*, *Switzers*, *Germans* and *Italians*. He declines here (which is also his Laudable Method throughout the whole Book) the Transcribing what has been written by other Authors concerning these Waters ; contenting himself with the Character *Paracelsus* gives them ; and adding some few Observations of his own. *Before all the Acidulæ I know in Europe (says Paracelsus. *) I must celebrate those I met with at St. Maurice ; in Engedin, which runs most Acid in the Month of August. Whoever drinks that Water as Medicinal, acquires Health ; and never becomes Subject to the Stone, Gravel nor Gout : For it so strengthens the Stomach, that it enables it to dissolve Tartar and divers other Bodies, which taken in our Meat and Drink occasion Distempers.* This Spring gushes out bubbling at the Foot of the Moun-

It. 2. p. 40.

* *Theophr. Paracelsi. de Morbis Tartareis, c. 16. p. m. 323.*

tain in a corner of a Fenny Meadow, about a quarter of a Mile out of the Village. The Well is half a yard over; and has a Building like a small Chappel for preserving it, and to keep it from a mixture with Rain. The Water has a strong Vitriolick Taste, and upon Tryal, he found it to be the heaviest of all he examin'd that whole Journey, *viz.* ziii. zvi. gr. 37 So that a Pound of it contains zi. gr. xxvi. of Vitriolico-Saline and Chalybeat Particles. That they contain such Bodies appears not only from the Taste, but also from these following Experiments. Spirit of *Sal Armoniac* with Spirit of Wine a little alter'd it, and the same Spirit with Urine turn'd it of a whitish Colour. Also Oyl of Tartar *per deliquium* made it Milk white; and Powder of Gauls turn'd it first carneous, and then of a Blackish Red. So that these Waters must proceed from Vitriolico Chalybeat Veins, wherewith the adjoining Mountains and Valleys abound. There are here and there, other Chalybeat Springs in the same Mountains, which leave a yellow Sediment, and have an Acid Taste, as particularly that on the North side of the Valley over against this *St. Maurice's Well*. The Waters of *Andera*, call'd *DAS BAD*, *It. 2. p. 29.* [or] the *Bath*] is an Insipid Chalybeat, containing in a Pound weight 51 Grains of Heterogeneous Particles. It turns a little whitish with Spirit of *Sal Armoniac* prepar'd with *Nitre*; somewhat muddy with Spirit of *Sal Armoniac cum S.V.* Milk-white on Affusion of Oyl of Tartar, with a Sediment of the same Colour, and reddish with Powder of Galls. Not far from the said *Andera* is a very clear Water, which if drunk plentifully creates an Appetite. It's of the same weight with the above mention'd Chalybeat, and strongly impregnated with Iron Particles, to which he ascribes its Quality.

But his largest and most particular Account is that of the *Pep- It. 2. p. 16*
per Bath [or *PFEFFERS WASSER*] which if it does not exceed all the Baths of *Europe*, may vie with the most celebrated of them. There has been an Account given of it in particular Tracts, by *Paracelsus*, *Mr. Kolweck* Secretary to the Abbey of *Pfeffers*, *Dr. Zimmerman*, *Augustinus Stöcklin*, *Abiss*, and *Schmuzzius*; and occasionally by divers other Authors. They were discovered by a Falconer accidentally, in the Year 1240. The Water breaks forth in a dreadful Place, scarce accessible to the Sunbeams, or indeed to Men unless of the greatest Boldness, and such as are not in the least subject to Dizziness; so terrible is the narrowness of the way, and of the Bridge which is supported al

most every where on Rocks, and so affrighting the swift Course and Noise of the *Tamina* dash'd against the Rocky Precipices underneath. The Aqueduct and Bridge are in length about 100 Paces. It is not one single Stream that breaks forth, but several, the chief whereof which is lock'd up, is so large that it suffices to turn a Mill. The side Springs, tho' the Water be of the same clearness and goodness, are not preserv'd for any use; but having got out thro' the Fissures of the Rocks and clayey Earth, mix their Waters with the Rapid *Tamina*.

These Baths have that singularity of all others, that they commonly break forth in the Month of *May*, and that with a sort of Impetuoufness with Beech-leaves, Crabs, or other Wood Fruit, their Course desisting at *September* or *October*; so that they may be reckon'd among the *MEYBRUNNEN*, describ'd above; tho' it must be own'd they flow more plentifully some Years than others.

U. S. P. 1, 2. In the Year 1704, the Author took a Journey to these Baths for the Recovery of his Health. His Distemper being certain Obstructions with no small pain in the Cutaneous and Glandulous part of the Head, especially at Full and New Moon, which he had been afflicted with for some Years; and which occasioned at last a violent Headach, which the Drinking of these Waters remov'd, tho' not the first Malady. Having on this occasion a great deal of leisure time at the Bath, he made it one main point of his Business to examine the Nature, Qualities and Effects of the Water; and after repeated Experiments, he professes himself of Opinion, for several Reasons moving him thereunto, that these Waters are not impregnated with any Minerals; or if they do contain any, that their Virtues in curing Distempers and preserving Health, do not proceed from them.

1. They are exceeding clear, destitute of Colour, Taste and Smell: For as for that seeming Sweetness, which some Drinkers think they perceive, 'tis nothing but what's common to all warm Water.

2. It is therefore accommodated to the Taste of all, because being perfectly insipid, it affects the Organs of all Men alike; that is, their Palates are not made sensible by any Figures of Sulphur, Salts, or other Minerals.

3. By Infusion of Various Liquors or Powders; of *Aqua fortis*, Tincture of Tornesol, Juice of Berberries, Syrup of Violets, Distillation of Vinegar, Spirit C. C. Spirit of Vitriol, &c. no change at all ensued; altho' each Infusion stood for the space of two Days.

Upon

Upon pouring on a Solution of Mercury Sublimate, he perceived at first no change; but soon after there appear'd on the Surface a small Film of the Beautiful Colour of a Peacock's Feather. Also Oyl of Tartar *per deliquium* caus'd no sudden Alteration, save only that some Hours after a small circular white Cloud subsided, the Liquor remaining diaphanous. In like manner *Tartarum tartarizatum Ludovici* produced a certain Whiteneſs. As for the Red Colour it receiv'd from the Tincture of Red Roses it soon disappear'd, the Water recovering its clearneſs. Theſe are but ſmall Changes, and common enough in other Spring Waters, as well cold as hot.

4. By ſeveral repeated Experiments, he found it to be of the ſame Specifick Gravity with Rain Water, whence he ſuppoſes it deſtitute of heavier Bodies of what ſort ſoever; or at leaſt not ſo far impregnated with ſuch, as the Effects might be attributed thereunto. He found this Water when warm, lighter than the cold by a Grain, in the Quantity of ſeven Drams, which he attributes to the rarify'd Air in the Pores.

5. No *Flowers* are here ſublimated, no *Cremor* ſwimming on the Surface no *Tophus* adhering to the Walls or found in the Aqueduct, nor any *Crocus* precipitated. He infers hence, that this *PEPPER BATH* is more pure and refin'd than any other Waters, whether Fountain or Mineral. If together with this, their moderate Heat be conſider'd, and the extraordinary refinedneſs of the Particles compoſing the Water, theſe Obvious *Phenomena* of their Healing and Prefervatory Faculty may be, he preſumes, without much difficulty explain'd; which Explanation, tho' new and curious, becauſe ſomewhat long, I leave to your peruſal in his own Words. As for the Uſe and Vertues of theſe Waters, he ſays, 'twould require a particular Tract; and therefore he only Tranſcribes the following brief Account of them out of *Wagnerus*.

*Theſe moſt celebrated and wholeſome Waters (ſays he) are an inex-
haustible Treaſure of Health, becauſe by drinking them as well as
bathing in them, they remove the Obſtructions of the Brain and Nerves,
afford great benefit to ſuch as are troubled with the Falling Sickneſs,
Apoplexy, Headach, Decay of Memory, Hearing or Sight; the Pal-
ſie, Cra mp, Convulſion, Stiffneſs of the Limbs, Obſtructions of the
Liver, Spleen or Meſentery, or Hypochondriac Melancholy. They
yield Relief to the Gouty, and to thoſe who are afflicted with Tedious
Agues, or with bruis'd or broken Limbs and Malignant Ulcers; with
the Stone in the Reins or Kidney. They dry up Tetters, Cancers, Pi-*

fula's, sore Breasts, immoderate Flux of the Mēstrua, &c. But let those who are afflicted with the Dropsie, Consumption, Hectick Fever, Yellow Jaundice, Gonorrhœa, Leprosy or Bloody Flux, as also all breeding Women, avoid the use of them.

Of the same weight with this of the *Pepper Bath*, which, as is said above, is equal to that of Rain Water, he often found the Waters of other *Alpine Springs*, which he therefore esteems the more refinedly distill'd; and as such, they are not only drank, but even quass'd off in large Quantities, by Strangers as well as Natives.

ii. 1. p. 9. II. Several of his Observations about METEORS, are no less remarkable than those on the Waters. The South side of the *SURENEN ALPS*, he tells us, are perpetually cover'd with Snow, and those Rocks of Perennial Ice of a pale blew Colour, call'd *FIRN*, which, as it seems from other Writers, as well as our Author, are no great Rarity in the *Alps*, tho' I could hear of no such thing in *Scotland*, and am sure there's nothing like it at *Snowdon*, and our other High Mountains of *Wales*. For this reason, the Natives call the Southern side of these *Alps*, *DIE WINTERLICH SEITE* [or *Winter side*;) and the Northern, *DIE SOMMERLICH SEIT*. Even the Valley of *ENGELBERG*, because guarded on all sides with such High Mountains, has always such a cold Air, that it has given occasion to the Proverb:

The pleasant Weather of Engelberg; Winter thirteen Months, and all the rest of the year Summer:

Which agrees with that of the *Grisons* in *RHINWALD*, who say,

The Year with them has three Months of exceeding cold Weather, and nine Winter.

3. 2. p. 4. He is of Opinion that cold Weather gains Ground. *In this Decay'd Age of the World*, says he, *most of the Seasons of the Year grow colder; the Winter longer, the Summer shorter, the Wine pale and harsh.* The *Alpine People* take notice, and he adds, that he can also confirm their Observation; that the Quantity of Snow on their Mountains increases annually; insomuch that in Places where in Man's Memory, the Snow that fell in Winter would all dissolve the Summer following, to the great support of Cattle and

Com-

Comfort of their Owners; 'tis now piled in great Heaps, such as never melt at all, but on the contrary are annually increased.

Whilst they ascended the High Mountain, call'd *SETMERBERG*, which is part of the *Julian Alps*, on the 21st of *August*; they were fatigued with the severe Rain and Sleet that fell, attended with a cold Northernly Wind. This Rain lasted all Night in the Valley, tho' the adjoining Mountains were almost half cover'd with Snow; and to Snow on Mountains whilst it rains in their Valleys, is but what often happens in our Mountains of *Wales*, and doubtless in the North as well in *England* as *Scotland*. It. 2. p. 32.

At *Selva piana* he takes notice of their Fountains being cover'd with a very thick Ice on the 24th of *August*. It. 2. p. 42.

On the *WALLENSTATTER SEE*, or *Lacus Rivarum*, in calm and fair Weather they have Periodical Winds; which the Watermen make good use of, as they sail from *Wesen* to *Wahlenbad*, as also in their return. Early in the Morning before Sun-rising, an East Wind begins, and blows in the calm Summer Weather (whence its common Name of *Hay-weather Wind*) till about Ten. From Ten to Twelve the Wind ceases, and the Air is calm. After Twelve a West Wind begins, and continues till the Evening; and after Sun-set the Eastern (which is then call'd *DER OBERWIND*) resumes its Turn. The Northern Wind, no very welcome Guest to the Sailers, sometimes interrupts these Regular Gales. A Reflection on the situation of this Lake, will give us a clear Account of the *Phanomenon*. The Lake of *WALLENSTATT* is extended, from East to West, in a free open Air; and that Air soon admits of the Rays of the Eastern Sun; as 'tis influenc'd also by the Western till the late Evening. But on the North and South sides of the Lake, there are exceeding High Mountains, which occasion that the Waves being dash'd against the Rocks, are forced back; whence that boisterous Roughness, which so often threatens the Sailers. Hence 'tis easy to conclude, that the Atmosphere being rarify'd, or at least in some degree expanded by the Rising Sun, cannot diffuse it self to all Quarters alike; and so not being able to make an equal Distribution of its Air, nor altogether to get rid of it, being imprison'd betwixt the High Ridges of *GLARIS*, *ZUG*, and *SARGANS*, 'tis forced to take its Course Westward. And whereas it desists at Ten in the Morning, 'tis because the Sun begins then to culminate the Meridian of the Lake, and to affect the whole Atmosphere impending thereon: But from It. 2. p. 52.

Y 2 Twelve

Twelve to Five or Six in the Evening, that part of the Atmosphere which pertains to *WESEN* is the more expanded, and so driven to *WALLENSTAD* directly in the same manner as the Course of the Eastern Wind has been explain'd. And as for the return of the Eastern Wind at Seven or somewhat later in the Evening, he thence infers, that the Portion of the Air which was expanded by the Heat of the Sun, and driven towards *WALLENSTAD*, is by that time returned to its narrow space, and forced, as 'twere by its weight, towards *WESEN*. This Account Dr. *Scheuchzer* gives of the Wind, puts me in mind of his Observation on the Air of this Mountainous Tract. *From repeated Observations* (says he) *on the Height of the Mercury in the Barometer, I gather that the Elasticity of the Air is much greater in these Alpine Countries, than with us at ZURICH, which I attribute to its greater Purity; the Explanation whereof I had rather hear from others of better Judgment and Experience, than pretend to it my self, by obtruding my own Conjecture.*

ii. 2. p. 15.

iii. 1. p. 17.

I must not here omit those Observations, he tells us, the *Alpine* People make, concerning the Signs of Fair Weather. Those of *ENGELBERG* expect Rain, when they see the Top of *STALLICSTOCK* cover'd with Clouds; or when they see grey Clouds appear Northward at the Entry of the Valley. In other Places of the *Alps*, an extraordinary Noise and Murmuring of the Torrents is a Token of Rain. At *Filifur* among the *Grisons* they have a Proverb of the Weather, which I Transcribe, because the only Words I have seen in that Ancient Dialect of the *Italians*,

*Cura ch' il pitz da Stiervi fo chiapi;
Schi lascha der la fotsch, & piglia il rasti:*

WHEN STERWISKNOLL A CAP DOTH
MAKE;
AWAY WITH SYTHE, AND FETCH THE
RAKE.

So at *Novena* near the Fountain of the *Rhine*, a Cloud, great or small, on *Cucarnil* Mountain presages Showers of Rain that Evening or next Morning. At *SIL* in the *UPPER ENGADIN* is a Lake about a Mile in length, and half a Mile broad, on which whenever there are Clouds, 'tis an Infallible Sign of Rain; but he quotes

quotes *J. Leopoldus Cysar* for an Observation (if his Proverb be not an Ironical one) contradictory to these Presages; which is, that *Mons Pilati* at *Lucern* betokens Fair Weather when it puts on its Hood. The Proverb shews so much the Identity of the *High Dutch* and *Ancient English*, that it needs no Translation:

*WANN DER PILATUS HAT EIN HUT,
SO IST DAS WETTER FEIN UND GUT.*

The Rupture with a thundering Noise of the *Alpine* Ice, and the Descending of the *Chamoises*, or *Alpine* Goats, into the lower Mountains, are also look'd upon as Forerunners of Storms. The *PASCHOLER SEE* presages Rain by its rumbling noise; and a small Lake, call'd *Calandari*, is whirl'd about, and swells before an approaching Storm; and roars so loud, as to be heard in the Opposite Mountains and Valleys, to the distance of six Hours; of which *Phenomenon* he gives us the Solution of *Cardan* and *Morhofius*, and lastly offers his own Thoughts.

In Fair Weather, he tells us, that there's almost continually a White Cloud hovering about an Erect Pillar, call'd *DER SENNEN-STEIN*, near *KUNKELS*. These sort of White Clouds the Mountaineers call *TROCKEN* and *HEUWETTER, NEBEL* †; affirming, that such Clouds (from the Appearance whereof they foretel Fair Weather) arise constantly from the Earth; which he afterwards found true himself; in the Ascent of *Speluga* and divers other Mountains. The Pillar above mentioned, he says, is not (as those of *Stonehenge*, and divers other Places throughout *Britain* and *Ireland*) erected by Mens Hands, but Natural; tho' the height of Thirty Foot. This one would think scarce reconcilable with an Opinion he is said to maintain, of an Atomical Dissolution of all Things the Terrestrial Globe consisted of at the Deluge; for if so, we are left to seek, what Mould such a Pillar should be cast in, and thus supported like an Erect Statue, ten Yards above Ground. But the truth is, he has no where hitherto, that I know of, profess'd publickly that Opinion, which has been long since sufficiently exploded in the Ingenious Examination of it. For in his Epistle before the Translation of *Dr. Woodward's* Essay,

† *Viz. Hay-weather Clouds.*

no only tells him, that his Book had convinced him, the Fossil Shells, &c. were of Marine Origin; which amounts to no more than what I had publish'd in the *Philosophical Transactions* two Years before that Essay appear'd*, tho' I since humbly propos'd to Mr. Ray's Examination, the Hypothesis you find at the end of the *Lithophylacij Britannici Ichnographia*; which had not he and other Friends thought useful, on Account (whatever may be said of it self) of the Observations attending it, I should not have been in the least fond of Publishing.

III. The MOUNTAINS he takes notice of, as most remarkable for their Height, are about an hundred; the Height of a great many whereof he calculates by the Barometer; as particularly that of the Broken Mountain or *Mons Pilatus*, One of the Tops of *Speluga*, *Mons Julius* above *Bevio* [or *Stabulum bivium*] and divers others; tho' according to his wonted Candour, he owns that Method liable to a great many Objections. Some of the *Helvetian* Mountains, most celebrated for Height, are *TITLISBERG*, commonly reputed the highest in all *Swisserland*, the height whereof he computes to be 358 Perches; *SPITZMEIL*, an exceeding High Mountain in *Glaris*; *BAMBERG* or *BANBERG*, to the Top of which, call'd *ECK* and *SURENENECK*, are five Hours almost continual Ascent; whereof above one Hour was thro' Snow, tho' in the Month of *August*. Amongst the *Grisons* he takes notice of *Tcherler Alp*, *auf Ammon*, *Tertsnerberg*, *Molserberg*, *Segnes Zuor* & *Zout* [i. e. *Upper and Lower*,] call'd by the *Swiss* *Flimserberg*, *St. Joannesberg*, *Heinzenberg*, *Beverin*, *Buntz*, *Caland*, *Calveissen*, *Den Julien*, *Mortshen*, *Munton*, *Maloya*, *Monte di Set*, &c. The Names of these Hills are, as we may guess by some Notes of the Author, so Ancient and Obscure, for the most part of them, as not to be Intelligible to the present Inhabitants. The Word *BERG*, which is the Termination of so many of them, and which might be added to all, is well known to signify *Mountain*; and we find *Alp* [Plur. *Alpen*] to have been anciently another Appellative for any Mountain of extraordinary Height; whence *Obhagalp*, *Hermisalp*, *Ochsenalp*, *Alplein*; *Firnalpen*, *Gersteinalpen*, *Schwenalpen*, &c. The latter of these two Words *Servius* tells us, is

* *Epistola ad D. Christophorum Hemmer M. D. Hafniensem. Act. Phil. Lond. N. 200.*

Celtic, as the other is *Teutonic*. 'Tis doubtless from this known signification of the Word in that Country, that our Author takes the Liberty of using it occasionally in the Singular Number. *WANDT*, whence *DIE WAND*, *DIE GLATTESWAND*, *DIE STAFFEL WAND*, &c. signifies properly a Wall; and is commonly used, as we find by *Rabman's* Verses on the *Chamoise* It. 3. p. 10. Hunters, for any smooth perpendicular Rock. *GRADT* and *ECK*, whatever they may here signify, are also no unusual Terminations in the Names of their Mountains. As *Niesseck*, *Stoerck*, *Sandeck*, *Scheideck*, *Roserech*; *Settengradt*, *Plangengradt*, *Kigertthalergradt*, &c. *Bamberg* he supposes so call'd *quasi FANBERG*, because of the Penalty inflicted on any one that cuts a Tree thereon, least by the Fall of Stones, &c. Houses should be destroy'd, and Men and Cattle kill'd or wounded. *Ban* or *Bean* in *Ireland*, *Scotland*, and *Wales*, we call any Hill of extraordinary Height; and peradventure the word here had no other Origin; as their River *Tamanna*, which comes from the Pepper-Bath, is perhaps no other than our *Tymyn* warm, which is also the Name of a River in *Montgomeryshire*. Those that have *STOCK* added to their Names, as *GITSCHI STOCK*, *ALPEN STOCK*, *OCHSEN-STOCK*, &c. either still are, or have been heretofore Woody; and the same may be said of *WALD* (whence *UNTERWALD*, *BARNWALD*, &c.) which the *Gauls* seem to have pronounced *Gant*, seeing that in some Parts of *South Wales*, they still use the word in that Sense.

As to the Alteration these Mountains have undergone; that they are made more steep one Age after another, is manifest from the Account of the Inundations of the *Alpine* Torrents. That most Learned and Indefatigable Naturalist *Conradus Gesnerus* has long since given us a Particular Description of the *Broken Mountain*; and I daily expect to see some Additional Observations thereon, in the Ingenious Dr. *Lamius* of *Lucern's* History of the Figur'd Fossils of *Switzerland* and the Countries adjoining.

On the 25th of *August* in the Year 1618, a considerable part of a It. 2. p. 35. Mountain, call'd *Conto* among the *Grisons*, a small Rock on the side of it being undermin'd by Water, fell down on the Town of *Piurs*, a very Rich and Populous Place; which together with an Inundation of the *Maira* at the same time, so entirely destroy'd it, that there remain'd not so much as the least sign of there having ever been a Town, excepting one Pallace, belonging to the Family of *Wertsmar*, still extant; which tho' a stately Fabrick,

it. 2. p. 33. was yet but a Summer-house to a Pallace they had therein. *Casaccia* another Town seated at the Bottom of two Mountains above mentioned, *Maloya* and *Septmer*, was half buried in the Ruins of one of them in the Year 1673; an immense quantity of Blue Clay being born down by a great Storm of Rain in *July*, which had been set at Liberty before, by the melting of the Snow in *April*.

it. 2. p. 46. The steepest Hill he ascended, and that which gave him more fatigue than all the rest, was *FLIMSERBERG*, or (as the *Grisons* call it) *Mount Segans*; but the most dangerous way was the *WAND ZUR WAND*, almost at the Bottom of *TSCHEINGEL* Mountain. This Passage wants not for Length and Tedioufness; but is moreover so exceeding narrow, that in some Places 'tis scarce three Inches over; and the Rock under it, in many Places bare and almost as steep as a Wall, of the Depth of some Hundreds of Feet. Above it is another continued Wall of Rock; insomuch that the Security of the Passengers, must depend chiefly on their fastning on the Bushes or Trees growing out of the Chinks or Fissures of the Rock above them. Such as are in the least subject to Dizziness are, to avoid such danger, conducted a great way about.

As to the Caves of these Mountains, it should seem they either are not very numerous, or else so common that he scarce thought them worth the mentioning, as affording little or nothing remarkable. These they only call *LOCHS* [or *Holes*] whereof those he mentions are *GEISSLOCH* and *BRÜDERLOCH*, with the *SILBERLOCH* and *GOLDTLOCH* on the steep Mountain of *Diarthelm*; and which is most worth notice, St. *MARTIN'S LOCH*, or rather (as some probably conjecture) *MATTHISLOCH* on the Top of *FLIMSERBERG*, through which the Inhabitants of the Town of *ELM* see the Sun yearly on St. *Matthew's Day*, as through an Optick Tube; concerning which he refers us to *Wagner's Hist. Nat. Curiosa Helvetia* *. He mentions an *Eolian Cave* at *BLATLISBERG* near *WESEN*; but the most remarkable in that kind are those at *Kiavenna*, or (as the *Germans* call it) *CLEFFEN*, amongst which the Inhabitants build those pleasant Cellars, call'd *Grotti*; where in the Summer Time, on account of the continual motion of the Air, the Wine is so exceeding cold,

* *Wagn. H. N. Helv. p. 237.*

that it cannot be drunk in them, but by those of a hardy Constitution, without some hazard of Health. Nor is it safe for Men to continue long in any of them. If a Paper be stuck up in one of these Grotto's; 'tis always bandied to and again with the Wind. They are remarkably warm in the Winter; but in the Dog Days so excessive cold, that in some of them one is scarce able to continue half an Hour. It's no small Labour in the building these Grotto's, to find out the *Spiracula*, or Vent-holes, whereof there are either one, or two, or three, and seldom more in each Cellar. The most cold are those which have their Vent from above. They who enter them Sweating, sometimes catch Agues, or else some other Fever. On account of the Vapours being collected into Drops, the Locks, and any other Irons of the Doors, become Wet on the change of Fair Weather to Rainy. The Liquor included in a Thermometer descended in these Cellars remarkably; and in the Barometer, the Mercury ascended a Scruple and a half.

IV. Having some Years since Publish'd his *Specimen Lithographia Helvetica*, and perhaps designing a *Lithography*, his Observations on Figur'd Fossils are not so numerous as we should otherwise have wish'd; which defect he makes amends for, by taking notice of all the other MINERALS that any where occur'd; which tho' I've reduced to a Catalogue, I omit sending you at present, as not having time to Transcribe it.

The *Strata* of Fossils he tells us, in their Mountains, are not Horizontal, but generally inclining towards the South. He takes notice that the Mines at the *SCHAMS*, and elsewhere among the *Grifons* (the Iron-works excepted) are rarely found in continued Veins; but that the Oar lies scatter'd in Lumps at uncertain Distances; nor are they here, as in the Rich Mine Countries of *Hungary* and *Saxony*, found in the deep Bowels of the Mountains, but near the Surface of them; a Particular Instance whereof he gives us of the Mines near *ANDER*, where the Oar next the Surface is well known to be considerably richer, than that which lies thirteen Fathom deep. He also affirms, that the Grounds where these Oars are, in this *Alpine* Countrey, are exceeding fertile; whereas in *Saxony* and *Hungary* such places are generally barren; the Grass being shrivel'd up by the Exhalations of their Rich Mines, which the *Alps* do not seem to abound with; and where those they have,

the Layers are of exceeding thick Stone, which suppresses those Noxious Steams.

V. His Observations on PLANTS being very numerous and Curious; and on such as are for the most part unknown to me; I can say little or nothing to them. His *Gramen montanum specieâ foliaceâ gramineâ* Raij, which I have often seen at *Snowdon* and our other High Mountains, is well represented in his IVth Table f. 2. as is also his *Saxifraga Alpina ericoides flore caruleo* Tourn. whereof they have great Plenty at the *Van* above *Brecknock*, as well as at *Snowdon* and *Ingleburrough*. The Moss-figur'd *Iter. 1. Tab. VI. fig. 2.* which he entitles a Variety of Mr. Ray's *Muscus terrestris repens clavus singularibus erectis foliosis*, seems referable rather to the *Muscus abietiformis*; and indeed from the Figure, I should take it for no other than our common *Fir-Moss*; as I should the 1st Figure of the same Table for our *Muscus terrestris Polypermos*; because the Fangs by which it creeps, and which would sufficiently have distinguish'd it, are not express'd. I find our High Mountains of *Wales* and *Ireland* afford several Plants not yet discover'd in these *Alps*; and perhaps those of the *Highlands*, none of which, tho' they are numerous, have been yet search'd, may afford some others; or at least some *Alpine* Plants not yet discover'd to be Natives of *Britain*. But on the other hand, the *Alps* afford much more Variety than we can pretend to. By the Mountains he mentions as abounding with Plants, and his Account of the height of them, I find that their Highest Mountains, as well as ours, afford the greatest Variety of these *Alpine* Plants. You have found, Sir, by Experience, that the Mountains of *San Leixid* and *San Berys* in *Carnarvanshire*, afford more sorts of *Alpine* Plants, than have been as yet discover'd on all the other Mountains of the Isle of *Britain*; and that amongst the Rocks of those Mountains, *Klogwyn Karned i Dyſva*, which being under the Peak of *Snowdon*, is the very Highest of them, has the most Variety; and indeed where such High Mountains want naked Rocks, the *Alpine* Plants they afford, are but few; as I have experienced by *Pym Lyon*, *Kader Veruyn*, and the Mountains of *Brecknock*. Those he most takes notice of in *Switzerland* for Rare Plants, are the *ECKER*, *SURENENECK*, *TITLISBERG*, *IOCH* [or the *Yoke*] *ENGELBERG*, *OCHSENSTOCK*, and *WALDNACHT*; and among the *Grisons*, *Spelunca*, *Monte de Set*, *Mcme de Soglio*, *Segnes*, and

and *Malogia*; not but that the other Mountains he names, may have probably the same Plants; but amongst those he search'd, these afforded the best Satisfaction.

The *Alps*, he tells us, above a certain Height, produce no Trees; It. 2. p. 31. and it should seem that even in their Fertile Valleys, some sorts do not grow so high, as they do elsewhere, seeing he looks upon It. 2. p. 22. as a Thing very Extraordinary, that a Hawthorn on the Bank of the *Rhine* near *ROTHENBRUN*, should arrive at the height of almost Ten Foot.

On *Guntzen* Mountain above *Sargans*, the *Beech* Wood is observed to be harder and heavier than elsewhere; and much more wreath'd and knotty. The Inhabitants attribute this Hardness, It. 3. p. 12. &c. of the Wood, to the Influence the Steams of the Iron and Steel Oars of that Mountain, may have on the Trees: *Which reason* (says he) *we need not too hastily reject; when we have consider'd that Wood by steeping it in Chalybeat Waters, is render'd so hard as in a great measure to resist Iron.* Another Observation he has on Timber, is that the Deal of the Red Fir, which grows on the highest Forests of *GLARIS*, and is therefore call'd *HOCH-WALDER HOLZ*, or *Upwood Timber*, is lighter and more Porous; and so fitter for Cabinet Works and Musical Instruments, than any other. The Circles, or (as they are commonly call'd) *Years*, are closer; so that those Trees of *GLARIS* are of a less Diameter than such as grow at *ZURICH*, tho' of the same standing.

VI. As to *ANIMALS*, his Industrious and Deservedly Famous Predecessor *Gesner*, having left him little to say; and his method being to pass by (as I have before observ'd) whatever has been well perform'd by others; we had but little to expect here, besides the following Account he gives of the *Chamoises*, or as the *Grisons* call them *Chiamuotsch*. About the *Pepper-Bath*, says he, It. 3. p. 7. *The High Mountains of Galand, the Gray Horns, and several other Alps* abound with Herds of the *Chamoises*; some Account of which I must not omit on this occasion, which has so often afforded plenty of their *Venison*. Amongst other Notes which *Gesner* has of these Animals*; One is, *That they meet often about certain Sandy Rocks,*

* *Lib. I. p. 331.*

and thence lick off Sand, as Tame Cattle do Salt, in order to cleanse their Tongues and provoke Appetite. The Alpine SWIZZERS call such Places SULZEN, as if Salt; and its usual for the Huntsmen to lodge themselves in some Private Shelters near them, that so they may be ready with their Guns, whenever they come to lick. Alfo Wagner in his Natural History of Switzerland, mentions Rocks impregnated with Nitre, resorted unto by the Chamoises. Such Places, says our Author, are not uncommon in the Alps; so worn for many Ages by the Tongues of Beasts, that even the Rocks are made hollow. - The Grisons call it GLACK, and those of Glaris and the other Swizzers, LACKINEN and SULTZ LACKINEN. But such Stones are not, or at least but very few of them, impregnated with any Salt; but somewhat Gritty and Friable, infomuch that they can easily lick off Sand from them. But whether they do this to excite the Appetite, or to rid their Tongues of Slime, or else to promote Digestion, is what he will not undertake to determine; but affirms it is certain, that when they cannot come at such Places, they'll take up with any Earth or Sand that comes in their way; as will also sometimes the Cows and Goats. " When they are hunted, says Gesner, they constantly ascend, till they get into such high Steep Rocks, " as are Inaccessible to the Dogs; where Dr. Scheuchzer takes notice, that in these Days, they use no Dogs in the Hunting them: And whereas Gesner says, that when taken, they may be tamed; he says, he could not mean those that were full grown, but their Young ones; which, if only a few Days or Weeks old, are easily caught, because they cannot follow the Herd. If older, their Method is, when a Huntsman shoots one of the Old ones suckling her Young, he lies down on the Ground, and holding her up as well as he can on the four Feet, the Young one coming to Suck, is snatch'd up and carried home bound; and even sometimes the Slaughter'd Goat on the Huntsman's Back, is enough to allure the Kid to follow him down to his House. These Kids (or rather as some others would call them Fauns*) being brought home, are fed with the Milk of Domestic Goats, whereby they become so tame, that they afterwards

* Raij Synops. Meth. Quadrup. & Serp. p. 78. Quod ad formam corporis hoc animal ad cervinam nobis accedere visum est.

herd with them in the *Alpine* Pastures, and also return to the Cots at their Dairy Houses: Tho' sometimes they forsake the Lower Pastures, and betake themselves to the Highest Rocks, as Places more agreeable to their Nature. They generally wander about the *Alps* in Herds; but not without some Order. They have a Leader, whom the Huntsmen call the *VOR-GEIS* or *Fore-Goat*; which standing on some remarkable Eminence, listens diligently with erect Ears, whilst the rest are feeding, looking about on all sides at the least noise: And if it hears or sees any thing, it alarms all the rest with a kind of Whistle; all which, after twice or thrice cropping whatever they feed upon, lift up their Heads, and take their Flight to some other Place. And thus they never live secure, excepting in the inaccessible Rocks, in the Winter Time, or at Night. They are no less careful in preserving the Lives of their Kids than their own; and therefore defend them with all possible Diligence from the Vultures; which when very Young and Tender, are apt to snatch them in their Claws, and when somewhat Older, by beating them with their Wings on the Shelves of the Rocks, to force them down Precipices, that they may afterwards Prey on them. They also take especial care, not to bring them to any dangerous Rocks, till they have had some Experience in Climbing and Leaping.

In the Winter they lodge themselves under such Parts of the Rocks as are hollow or shelving about the midst of the Mountains, which secures them from the danger of being involv'd in those vast Heaps of Snow, that so frequently slide down the *Alpine* Rocks; during which time their Food is either the Roots of Herbs, the Sprigs of Trees and Shrubs, or Green Herbs which the Snow had cover'd. The other part of the Year, they feed in Sunny Places; but before Sun-rising, and after Sun set, they either lie in the Snow, or under the Shadows of the Rocks. They who hunt these Beasts have a very laborious as well as dangerous Task. The high and steep Ridges of the *Alps* must be climb'd, thro' Horrid Rocks and Cliffs, to other Men inaccessible, and over Perennial Ice and Frozen Snow; for which reason they walk with Iron Instruments fasten'd with Tongs to the Soles of their Shoes. It happens that sometimes standing on a narrow Shelf of a Rock, having scarce half the breadth of their Feet to support them, they drive a *Chamoise* to that Pass, that it has no other way but that most narrow Passage to escape. In such an Accident, either the Beast is shot by the Huntsman, or else it endeavours to make

its Escape by him ; in which case the best Course he can take, is so to close up his Body to the Rock, that there be no Intermediate Space ; so that then the Beast returning on the outside, the Huntsman is safe himself, and most commonly forces the *Chamoise* down the Precipice. But if it should perceive the least vacant space, betwixt the Man and the Rock, it endeavours to enter it with such force, that the Man is thrown down Headlong. To such necessity are these Men sometimes driven, that in order to save their Lives by Leaping, they are obliged to take off their Shoes and slash their Heels with a Knife, that their Feet being Bloody, may be the more Clammy, and so not so apt to slide. It's remarkable, that when these Goats are thus pursued, they will rather stand still and expose themselves to be shot by the Huntsman, than enter a *FIRN*, or Rock, as it may be call'd, of Perennial Ice, especially those of a Blue Colour, unless they should be cover'd with Snow ; by which means a *Grison*, not long since, shot three of them in the space of one Hour. These Huntsmen expect the best Success when the Wind is in their Faces ; for if it be with them they smell the Powder, and even Men, tho' they should not have any about them, at a very great distance, which immediately sets them a running. And indeed were it not a thing well known, that they excel in the Sense of Smelling, the Largeness of their Olfactory Nerves would be a sufficient Indication of it.

H. 2. p. 21. As for that sort of *Topho* or Ball found in the Stomachs of these Animals, those that live on the *Galand* seldom or never have any of them ; which the Mountaineers attribute to the Barrenness of those Rocks. However that the *Chamoises* of one Mountain are much more apt to have them, than those of another, is what all the *Alpine* Huntsmen agree in ; and it's well known, that in the Northern Mountains of *RHINWALD* they never have any ; whereas those of the Southern, after they are three Months old, seldom or never want them.

H. 1. p. 19. In the Year 1699, it happen'd that one of these Goats quitting its own Kind and Native Soil, which is always the Highest *Alpine* Rocks, descended to the Lower Pastures in the Valley of *ENGELBERG*, and there herded among the Cows and Horses, nor would by any means be driven away. A Neighbouring *Chamoise* Hunter, surprized to hear a thing so unusual, gets his Gun and does that without any Trouble, which at other Times had cost him a great deal of Fatigue. A Curious Gentleman, being desirous

desirous to learn the Cause of a Thing so unnatural, dissects it, and finds the *Dura meninx* cover'd with an *Hydatis* full of *Serum* and small Sand; whence it appear'd, that this *Chamoise* had the *Vertigo* or Giddiness, seeing that such an *Hydatis* is well known in all Countries, to be the Cause of it in Cows and Sheep. When the Cows are troubled with it in the *Alps*, the Effect it often has, is that they turn themselves about continually, making at any place where they hear the noise of Water, until they come to the Bank of that Brook or River, where neglecting their Food, they stand stock still, as if delighted with the sound.

Thus, *Sir*, I have given you some small Account of that Part of the Author's Observations, that regards *Natural Philosophy*, properly so call'd; all which (together with the other Part of the Work) is illustrated with about 40 Copper Plates. As to those he has on the Customs and Industry of the People; on the Diligence of the *Grisons* in repairing the *Alpine* Roads; on some late Improvements in *Agriculture* and *Gardening*, and the *Antiquities* he takes occasion to mention, I leave them to your Perusal in his own Words; adding only, that to me he seems a Person of no less Candour than Learning, and that I doubt not, but making Allowance for the Interrupted Transitions, unavoidable in a Diary of such Variety of Subjects, you'll find the Perusal of the remaining Part of the Work, agreeable. At least I must acknowledge the whole appear'd so to,

Oxford,
April 3d.
1708.

Honoured S I R,

Your most Humble Servant,

E. Lhuyd.

L O N D O N,

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