

H. *An Account of some Experiments relating to the Production of Fire and Flame, together with an Exploſion; made by the mixture of two Liquors actually cold.* By Frederick Slare, M. D. Cenſor and Fellow of the Colledge of Phyſicians: and of the Royal Society.

I Gave an Account of ſeveral Experiments made by the mixture of various Liquors, ſome of them produced much Heat, others a great Ebullition with a cold Effect, others ſparks of Fire without Ebullition, and ſome few that did produce an actual Flame; but the difficulty to make the *Phoſphorus* (which was uſed in the greateſt of theſe flaming Experiments) is ſuch as has made that ſort of Experiment ſcarce Credible by ſome, and Practicable by few; in ſo much that I queſtion not but that it will be grateful to the Curious *Vir-tuoſo* of this Age, to ſee two clear Liquors both of them actually cold, without any intermediate or third Body, riſe up to a flame by kindling one another; beſides having made it eaſie for them to make or procure the Ingredients which perform this, not common Effect, it may yet be more acceptable.

*Philoſoph.
Transact.
of the year
1683.
Month of
Auguſt.*

The Experiment of Accenſion.

Take of any one of the Eſſential Oyls ſet down in the Catalogue, one part, of the Compound Spirit of Nitre two parts, (theſe may be Drams if you pleaſe) and they will with great Celerity and a great Noiſe produce a Flame, which laſts a very little while, but leaves an inſpid *Caput Mortuum*, as light and taſtleſs as a Cobweb.

But

But lest we should incur the Censure of those that may attempt the making this Experiment, for want of setting down such particular Directions as are necessary to make this nice and curious Experiment, successful, I intend to be very plain and distinct both in the way and Method of preparing the several Spirits and Oyls that are used about it, and also as to the manner of mixing them.

1. This Experiment should be made under a Chimney, or any convenient Draught, that so the offensive steams may evaporate.

2. A Gally-Pot, spacious enough to hold four or five Ounces of Water, may be a convenient Vessel for this Experiment, if you only use the forementioned Proportion; but if you please to use larger quantities, then you must enlarge the Vessel.

3. You must put the Oyl into the Gally-Pot first, and then pour the Spirit on the Oyl, because the Spirit being heavier, does the better pass through the Oyl, and make a more Expeditious Mixture. This must not be dropt in gradually, but conveyed in altogether.

4. Hold not your Head too near the Gally-Pot, lest the sudden Explosion of the Matter should strike up some of it into your Face.

5. The Compound Spirit will lose much of its Vertue if kept too long.

The way of Preparing the Spirits for this Experiment.

Take of Salt-Peter and Oyl of Vitriol equal parts, and Distil these out of a Retort in a good Sand Furnace, so that the Sand continue red-hot for some hours, for the Fire cannot be too great; the Fumes will rise of a very deep red colour, and will settle in the Receiver, in the form of a Liquor, which must be carefully preserved from the Air; this being the Spirit with which all
our

our Experiments were made, which are referred to in the Catalogue.

To make the Common Spirit of Nitre, you need only to mix five or six times as much Clay as you take of Nitre, and Distill them in a Retort, and you may obtain a strong Spirit of Nitre this way, especially if you dephlegm it, and rectifie it to the best Advantage.

With this we have made an Experiment of Accension succeed sometimes, but with great uncertainty: but the first, which I call the Compound Spirit of Nitre, is only to be relied on.

That Chymistry has been very pregnant in producing many good *Phænomena* very Serviceable to the better Explication of Natural Philosophy, and also very useful in Preparing Medicines for Curing Diseases, the Learned Men of this Age do generally allow; and that *Glauber*, though a very Chymist or Laborant, and nothing at all of a clear Philosopher, has yet led on the best of Chymists, not only to make good Furnaces, but also other good Medicinal Preparations, I found the Matter of Fact the truer the more I perused him. He hints at the way of making this Compound Spirit of Nitre, and also the Compound Spirit of Salt, by Distilling them with Oyl of Vitriol, but after such an Invidious and Ænigmatical manner, that he obscures it all he can, and leads the Operator forward and backward on purpose to perplex him; which indeed has had this good Effect, That he has put us upon differing ways of Preparing this Spirit, and making it much more Noble than the Author did himself, who yet so over-valued it, as to think he had found the greatest *Arcanum* in the World, and set this on the top of his Preparations, stiled, *Miraculum Mundi*, and the other Salt must be called *Sal Mirabile*; to which he attributes Twenty Six such extraordinary Properties, as the Experimentors of this Age can no wise find, neither in his Salt, nor in the whole Creation. But had

had he been so Fortunate to have found out this Illuſtrious Experiment, it would have blown up his Fancy to ſome great Rapture.

Having got over this Digreſſion, I come now to attempt ſomething as to the Aetiology of this Experiment, and will firſt endeavour to find out what ſhare our Compound Spirit of Nitre has in making this *Phænomenon*, and then will ſubjoyn my thoughts about the Oyls.

This Compound Spirit ſeems to be the Active Principle that ſtirſ up the Oily, or more Paſſive Particles to take fire, which will more eaſily be agreed to, if we conſider that our Compound Spirit of Nitre does not only conſiſt of all thoſe igneous Particles to be found in Common Spirit of Nitre, but that it has alſo all thoſe igneous Particles which Oyl of Vitriol contains in it, crouded into our Spirit of Nitre made this way.

For further Illuſtration, let us conſider what Oyl of Vitriol is. It is a Creature of the Fire: That the Sulphur, which is plentifully in Vitriol, or in Copperas, is accended, and afterwards diſtilled over in the form of a Liqueur, which is a liquid ſort of Fire, as having many Properties of it. If you put it to Water it will make it boiling hot; it burns not only Linnen and Woollen, but Wood to a Coal, and ſcarce ſpares any thing.

Nitre, the other Ingredient of our Spirit, is very ſuſceptible of Flame, which does alſo incorporate many igneous and corroſive Particles after it has ſo many hours lain ignited in the Fire, comes over, by Diſtillation, very highly impregnated with the ſame fiery Particles; which is obvious to any one that has uſed to make Experiments with it. For Nitre it ſelf has no diſſolving or heating Quality, but is a great cooler, and ſcarce can be reckoned amongſt Acids; but after it comes out of the Fire in the form of a Spirit, it tears in pieces almoſt all Metals, and brings them to a ſort of Fuſion, as actual
Fire

Fire does; it dissolves Animals, and Vegetables, and Minerals; and has many Effects of Fire. Therefore from an Union of these two very fiery Spirits results a much greater quantity of igneous Matter.

That Fire is very apt to incorporate with Fluids, and even such as have had but a small Communication with it, an Experiment which I formerly exhibited at a Meeting of the *Royal Society*, makes probable.

We took of Spirit of Wine that was highly rectified a Wine-Glass half full, and placed a tender Weather-Glass or Thermometer in the Glass, and then put a Spoonful of Water to it, this immediately warmed the Liquor, and made the Weather-Glass ascend two Inches at least: The Liquor in the Weather-Glass subsided as the other Mixture grew cold. I made it more sensible to the Touch by filling the Palm of the then President's Hand with Spirit of Wine, and putting a small quantity of cold Water into the same Hand, which made it sensibly warm his Hand, as well as others that made the Tryal. But from this Spirit, which is too Volatile to endure much Communication with the Fire, you may expect only a mild tepid heat; I am apt to believe, that there is scarce any thing which lies long in the Fire, but is apt to retain some igneous Particles; which does appear to be so in all fixed Salts, in Quick-Lime, and more particularly in Iron. If you take a Bar of Iron, though of a Hundred Years old, and file off about a Pound of it, and then you do mix and imbibe these Filings with a due proportion of Water, enough to make the whole just moist; the Fire, which all this while lay concealed in the Iron, being more disposed to enter into the fluid, does by these means warm the whole Mass. The Iron gained this heating Quality by Fusion in those fierce Fires which first separated the Metal from the Ore. For it is not in the Nature of the Ore before Fusion to emit any heat, as I have found by mixing Water with it.

There are a great many other Instances which make it very plain that Fire will add both to the bulk and weight of Bodies ; but these affect Solid Bodies more manifestly. The Effect it self produced by our Fluid does necessarily prove the inherent fiery Particles to have caused the Accension.

And this leads us to the other part of our Matter, which in conjunction with the Compound Spirit causes this Accension and Explosion.

But here it will not be amiss to premise a distinction of Oyls into Vegetable, Animal, and Mineral ; having made some Experiments with all these, but most of all with Vegetable ; for which reason we subdivide again the Vegetable into those made by Expression, and those made by Distillation : And of those made by Distillation we distinguish those that are made out of the Seeds from those that are made out of the Trunks, or Cortex, or Roots, or any other part of the Vegetable. We further observe a difference betwixt those Seeds that have only a fragrant smell and a pungent tast alone, from those that have both Odorous Emanations and a brisk Tast together, and those that are insipid, and have no smart Tast.

In the first place we must set aside those Oyls made by Expression. For having tryed Oyls of Line-seeds, of Nuts, of Olives, of Almonds, &c. we found these would not make Explosion or Ebullition, or so much as any Fermentation with our Fiery Meteor. Nor could I without much stirring bring them to incorporate : And when they did incorporate the heat was but just sensible, and the reason may be because this sort of Oyl, though allowed to be a true *Pabulum flammæ*, for it may be made to flame alway, yet it is not a true Oyl, although it must be allowed to have one Property of Oyl, that it mixes not with Water ; yet it doth not stand the Test of the Fire, for if you Distil it, you may part from it

Water

Water, and Earth, and Soot, and a true Essential Oyl, which afterwards will bear repeated Distillations without any further dissolution.

Having set by these Vegetable, but not Essential Oyls, we will briefly examine the Mineral Oyls, of which there are some, as Oyl of Vitriol, Oyl of Sulphur *per Campanam*, that have not any Property of Oyls, but are rather Acids, and Corroding *Menstruums*. There are others that have the true Property of Essential Oyls, as *Oleum Petreoli*, and *Barbadoes Tar* highly rectified, which do not produce any Remarkable Heat, much less make an Ebullition or Explosion: Nor does that active Oyl of Amber do any thing more.

The stillatitious Oyl of Bees-wax had much the same Effect when it was incorporated with our Compound fiery Spirit: And this inclines me to believe that the Wax it self may be a Compound more belonging to a Mineral than Vegetable Nature.

And now we will examine those Essential Oyls, which do produce great Ebullition, Explosion, and Flame, with the Compound Spirit. Of these we have two sorts, Vegetable and Animal.

The true Vegetable Essential Oyls do all of them make violent Ebullition and Explosion, and several do actually take fire and Flame, as the Catalogue of Experiments do specify.

If it be enquired into, what share the Oyl has in producing this Fire, whether only it be a *Pabulum*, or Fuel, for the Spirit to actuate, and so be merely Passive? Or whether it contributes any Particles that do help to excite this Flame?

In order to resolving this Doubt, we consider, That these Essential Oyls are produced from Seeds that have very active or warm Parts or Spirits, such as will easily ferment and heat, and have a warming Influence upon our Tongues, and do give heat to the Stomach and

Blood of Animals. That the Seed is the System or Concentration of the whole Plant, and has Spirit or Ferment enough lodged in it to assimilate all that insipid watry Element (which contributes Matter to its growth) into its own Nature; from hence the great quantities of Essential Oyls are produced. It's true, out of the Trunks, and Roots, and Parts of Trees we have Essential Oyls extracted, but with a vast disparity, there being only a very small quantity (in proportion to what is in the Seeds) floating up and down the other parts of the Vegetable.

But I am not only to take notice of the Potential warmth of the Vegetable, there being in my Opinion another Ingredient fit to be observed, which our Essential Oyls may be proved to contain, and that is a Volatile Salt, which gives much of that pungency to the Taste. If we consider the Constituent Parts of these Active Vegetables, they much abound with Salts, which by a moderate Fire are made Volatile, and by a violent Fire are fixt. This seems to me more than probable by what I have found in a quantity of Oyl of Cinamon, having had it in my own keeping for Twenty Years; for about Ten or Twelve Years it continued the same, but within these six later Years it has Annually let fall some Salt, insomuch that it is now one half of it turned to Salt, and this without any addition or any Art used to reduce it to this form.

There is also separated in Distillation of great quantities of Vegetables, as of Thyme, Organ, Penny-royal, &c. a Volatile Salt of a peculiar Nature (which our Excellent Chymist, Mr. *Molt*, first shewed me, and keeps quantities of it by him) this is very clear, or Crystalline, in its Specifick Gravity a small matter heavier than Water, and seems to be Salt and Oyl coagulated into a Body: It will not dissolve in Water, but easily evaporates when heated. I now consider these Salts as Alkalies, which

which all true Volatile Salts are, they do presently Ferment and make great Collision with Acids, and therefore am much inclined to make this Inference, That our Oyl is not a bare *Pabulum ignis*, or an unactive Principle, but does upon a double account as well upon the score of the incalcescent Oyl as of the inherent Salt conspire with the Compound Spirit to make this great Heat, Explosion, and Accension.

In the Catalogue of Experiments,

We may further observe, That of the light Essential Oyls drawn from Seeds of Vegetables, all of them do make a great Ebullition with an Explosion, but that few of them do actually take Fire: And that all of those that are drawn from Trunks or other Parts of our Vegetables, do certainly take Fire and Flame. Wherefore having observed that these that do not take Fire or Flame, did yet make as great an Explosion and Ebullition, and probably as great a Heat as those that did, I was apt to impute it to the Lightness and too great Subtily and Volatility of those Essential Oyls, whose very active Particles did too soon exhale or fly away. And this Conjecture is something justified by the Addition of a more Ramous Body, (which was Balsam of Sulphur made with Oyl of Turpentine) to our most Volatile or Subtile Oyls, which then produced a Flame, whose Particles being more Crais or Ramous, will detain the more Volatile Oyl from too soon an Explosion, and give more time to the fiery Spirit to penetrate, and mix it self with those Combustible Materials. And this may be one Reason why the Ponderous Oyls distilled from the Roots or Ligneous parts of a Plant do all take Fire, namely, because the parts of this sort of Oyl lying closer together, do not so soon dissipate after the Spirit is
cast

cast upon it. And then to the Specifick Gravity the difference is also very considerable, which any one may find by this familiar way: If you fill a Glas with one Ounce of the Essential Oyl of the Seeds, you will require Nine Drams of the Ponderous Oyl of the Vegetable to fill up the same space.

This is also very obvious to any Spectator, that most of these Oyls thus distilled are more Ponderous than common Water, by their sinking to the bottom; whereas all our Essential Oyls drawn from the seedy parts, do swim on Water, and some are lighter than the best rectified Spirit of Wine, but most are lighter than Brandy, which has made our Chymists call them Ætherial Oyls.

In the Catalogue of Experiments you may find which are the Ponderous Oyls, that do constantly take fire. Moreover the Ponderous Oyls have yet one Advantage above the lighter Volatile Oyls, they having been exposed to a longer and stronger degree of Fire than the others, and so do incorporate more Igneous Particles with it self, which being put into motion, may contribute something to cause this Accension.

The Oyls distilled from Animal Bodies do all of them take Fire and Flame, but with this difference, they do not make so great an Explosion as the Vegetable do, but do more certainly take fire, and will continue their flame longer, but not so fierce as the other. If we rightly Examine the Constitution or Texture of this Oyl, we have several Properties adapted to the Production of this Effect. You have a much greater degree of Fire required in the Distillation of this Oyl than is necessary for that of the Vegetable. You have also a great quantity of Volatile Salts (which are true *Alkalies*) that do pass over with your Oyl: And you have a Ponderous Oyl, that sinks in Water; which being considered and weighed together, do make it equitable

table to expect a more constant Accension from the Animal Oyls than from any other.

Oleum Succini is justly put in the Catalogue of Minerals, and is produced by a strong degree of Fire (as is above mentioned) does yet not make any Motion, and scarce any Incalcescence with this Oyl, notwithstanding its abounding with Volatile Salts: The reason is, because these Salts are not properly Volatile, as *Alkalies* are, but do belong to the Family of Acids, and so can make no Ferment with this Compound Spirit, which is it self highly Acid.

Having now made it plain and easie for any one to make two Liquors, actually cold, without any adventitious heat or fire, boyl up to a Flame, it will seem strange that after so many Experiments made in the World by all sorts of Chymists, and with all manner of Fermenting and Fiery Ingredients, none should have discovered a certain way of producing this great and desirable Effect. For though I will not question the veracity of the great *Borichius*, who declares to the World, that he made his Oyl of Turpentine and Spirit of Nitre to take Fire and Flame; yet for my part, after so many unsuccessful Experiments made with the greatest Accuracy I could, I must still own my incapacity to perform it: But if you add some drops of Balsam of Sulphur to that Oyl of Turpentine, the Effect will then very certainly succeed, and your Mixture advance to an actual Flame. However it may prove as to this last mentioned Mixture, the great variety of other Liquids that are made to kindle and produce flames, will now put the Matter of Fact out of Question, which I am told has been by many Experimentors doubted of.

*A Strange Experiment of Explosion and Accen-
sion made in Vacuo.*

I Shall venture here to add one surprizing Effect of this Fiery Mixture, which was done in the Presence of several Spectators.

We took half a Dram of the Oyl of Carui-Seeds, and poured it into a little Gally-Pot, and put a Dram of our Compound Spirit of Nitre in a small Vial into the same Gally-Pot, and placed over it a Glas that held Three Pints upon Monsieur *Papin's* Exhausting Engine, and having soon cleared it of the Air, we turned up the Vial in Order to see what Effect would ensue, in this sort of *Vacuum*, upon this Mixture: But in the twinkling of an Eye the Receiver was blown up, and the Mixture in a flame, which stupendous *Phænomenon* surprized and frightned us all. Nor did I ever see or hear of the like by any Mixtures made in *Vacuo*, though I have my self seen a Thousand. For if we look into those many and Admirable Experiments made by the Immortal Mr. *Boyle*, the removal of the Air did almost always extinguish Light, and Fire, and Flame.

The blowing up of the Glas does also make the Experiment the more astonishing, and puzzles one how to Account for so great a quantity of Air as was produced from these Liquors, which amounted only to a Dram and half; for here was required not only Air enough to fill up the capacity of the Vessel, but also there was required so great a pressure within as did exceed that great incumbent weight of the Air that pressed upon this capacious Glas without, (whose Diameter was Six Inches, and the depth above Eight) for otherwise it would not have thrown it up into the Air.

If we review and consider well the *Phænomena* of this Experiment, we may find the resistance of some Hundred weight that was countervailed ; and not only so, but with a much greater force exploded.

That it was not produced by any Expansion of the Common Air, for that was seen to rise out of the Liquors themselves, and was drawn out of them in their separate state by the Exhausting Engine, which suffers no Elastical Air to lye concealed in any Liquors.

That it was produced in an instant by the mutual Collision and Agitation of these Active and Self-Expanding Liquors.

That it was not absolutely generated, *de Novo*, but that the Air was antecedently there, we may reasonably believe, although in a very differing state from what it is in, when in *Pleno*. For all that the Exhausting Engine does is to deliver the Air from a state of Compression, by leaving it to stretch it self like a Bladder, that has full liberty to swell up, and has no hard Body to streighten or oppose its Expansion : So that we have cause to conclude our Liquors to be furnished with this sort of Air, which, being by the Accension of these two Liquors put to a new and violent motion, do expand themselves, *de Novo*, and to that degree, as to answer so great an Effect as is above-mentioned.

The Circumstances of which *Phænomenon* will allow me to call this Mixture a sort of Liquid Gun powder, which brings me to make

A Comparison with Gun powder and the Fiery Mixture.

These *Phænomena* agree, in that both do heat, and burn, and flame ; and also do considerably resist and raise up Bodies that do oppose them : In both, the Air is much agitated and expanded. For in Gun-powder you have much Air coil'd up and included in Particles

of Nitre, which the Brimstone and Charcoal by their sudden Accension do violently expand and swell to that degree, that like a storm of Wind it bears very heavy and resisting Bodies before it, especially when it is compressed or restrained within just Bounds.

The Experiment just above mentioned can only account for that Explosion by charging it to some little concealed Air our Fiery Mixture expanded; in so much that I doubt not that if a way were invented (which seems to me not impracticable) to make it go off as Powder does out of a Gun, it would project a heavy Body a great way.

We further made an Experiment in *Pleno*, or after this manner:

We put a small quantity of the Oyl in a Gally-Pot, and some of the Spirit in an open Glass, and fixed a Plate of Copper upon the Gally-Pot, so as to cover it pretty exactly, and then set a Weight upon the Plate, and pulling a string, made the Spirit to mix with the Oyl, which did at that instant blow up the Cover, and throw off the Weight.

But though it doth in some respects agree with Gun-powder, yet in others you see a great disparity: For Gun-powder will not be made to take Fire, or make any Explosion in *Vacuo*, both which this Mixture performed with the same Celerity it did in the Air.

Gun-powder is a Composition of the most dry and Combustible Materials we can pack together; in our mixture of two Fluids, one of them is not easily made to burn by it self, and the other will extinguish Common Fire.

Gun-powder requires actual fire to bring it to an Accension, whereas in this you have only two Waters or Liquors, both cold to the Touch, that do produce Fire and Flame by the bare joyning and mixing them together.

And

And now we will conclude this Experiment, only taking notice of the *Caput Mortuum*, (as Chymists call it) or of what remains after the Accension is over, which seems to be something uncommon.

In case you have adjusted the Proportion of Spirit to the Oyls exactly well, you will not fail to make the Mixture flame: And upon the extinction of the flame you will have a light and blackish Substance, which will indeed vary both as to the Bulk and Complexion, according to the difference of the Oyls. But in this they all agree, namely, to leave behind a spongy and exceeding light Matter, and perfectly insipid. Sometimes it swells up into a great Protuberance, as big as a Man's fist above the Gally-Pot; and if you tast it (which you may safely do) and macerate it in your Mouth, you will find it to be as tasteless as Paper, or even Paper when burnt to Ashes. In so much that we may safely conclude that by this Powerful Mixture a third Solid Body results absolutely differing from either of the two mentioned Liquors: And which makes it the more Remarkable, that both of these Fluids, which have so great an impression upon the Organs of Smell, and a very great one on the Organs of Taste, should in an instant be destroyed, and terminate in a dry insipid *Caput Mortuum*, which will not melt in the Air, nor be dissolved by Water, nor other Corrosive *Menstruums*, but remains as much a *Caput Mortuum*, as a piece of Paper, or a Rag burnt to Ashes, if not much more.

Upon a review of the whole, this Experiment will possibly not only surprize and amuse some, but please and delight others; and not only so, but perhaps afford some Instruction to a Philosophical Genius. By this the Power of Motion, in order to the producing those great Effects of Heat, Fire, Flame, and Light, may be considered; the Natures of Oyls somewhat examined and extinguished, the Productions of new Bodies by the

Power of Mixture represented, and I hope in time some Mechanical use made of it, at least its heartily wished fo.

Since this Paper was almost finished, having discoursed with Mr. *Molt*, a most Ingenious Chymist, and deservedly a Fellow of the *Royal Society* (to whom I must acknowledge an Obligation for the liberal use he allowed me of his great and Excellent Collection of Essential Oyls) about his Observations in those Tryals he has made, and particularly about Oyl of Turpentine, whether he did ever make Oyl of Turpentine take fire, which he does affirm that he has performed it; but yet it proves so hard a matter to bring it to an Accension, that he is always doubtful of the success.

I know that if a Candle be brought any thing near the smoak, raised by this Mixture, then the Oyl will certainly take fire from the flame of the Candle. Not but that I am glad of this or any Opportunity to do Justice to the Memory of the Famous *Borichius*, who has Printed an Experiment of this sort in the *Acta Hafniensia*.

Mr. *Molt* did also inform me, that Spirit of Wine would give a flash of Light with this Compound Spirit, but not burn; and he has observed the same Circumstance in his Experiment (which I did formerly in the Year 1683.) That if you put your Spirit of Wine to the Nitre, you will have a great Effervescence immediately ensue; but if you invert the order, and put the Spirit of Nitre on the Spirit of Wine, you will not have any Ebullition for some time: But this Circumstance is quite contrary to all the other Experiments we have made about the Oyls.

That the Spirit of Wine does not take fire, seems to proceed from the same Impediment which hinders light Oyls from coming up to an Accension, because they are so suddenly thrown off; and there seems to be a great Analogy

Analogy betwixt Ætherial Oyls and the Spirit of Wine, both as to Specifick Gravity, and as to other Properties, Spirit of Wine seems to be a more thin and diluted Essential Oyl, that contains some Water and more Air in its Pores, they seem to own the same materal Cause; for if you Distil an Essential Oyl out of any Seed, you shall not then be able to produce any Spirit, and *Vice versa*, if you Distil off the Spirit first, no Oyl will follow. There is also a great affinity in Texture, for the Spirit and Oyl do easily unite and mix together, especially if the Spirit be highly rectified, and have less of Water or other heterogeneous Matter in it; as any one may find if he will take the pains to shake a true Essential Oyl with Spirit of Wine, a good proportion of the former will incorporate with the latter.

POST-SCRIPT.

THE *Pyrites* being the Mother of our Oyl of Vitriol, which is the principal Ingredient in our Active Fiery Meteor or Compound Spirit; I will here set down an Account I received of an honest unphilosophical Friend of mine, who complained of his great Loss, which he attributed as a Punishment of his Covetousness. He was Master of a Copperas Work at *Whitstable* in *Kent*, and engrossed all the *Pyrites* or Copperas-stone to himself, in order to the breaking of a Neighbours Work, in so much that he had laid up two or three Hundred Tun in a heap, and built a Shed over it to keep off the Rain: But in the space of six or seven Months it first smoaked, and then took fire, and burnt for a Week; it burnt down the Shed, some of it look'd like melted Metal, and other parts like red-hot Stones, but discharged so fetid, Sulphurous, or stinking Exhalations, that the People in the Neighbourhood were miserably afflicted, and forced to use all their endeavours to extinguish it.

How far this Communication will serve the Hypotheses of those that derive Lightning, and Thunder, and Earthquakes from the Matter of the *Pyrites*, or will Account for the Rise or Continuance of burning *Vulcans*, or even the Great Conflagration of the World, I leave to their Consideration.