A RICH CABINET,

WITH

Variety of Inventions,

Unlock'd and open'd, for the Recreation of Ingenious Spirits.

Being Receits and Conceits of several Natures, and fit for those who are lovers of Natural and Artificial Conclusions.

AS ALSO

Variety of Recreative Fire-works both for *Land*, *Air*, and *water*. And Fire-works of Service, for Sea and Shore.

Whereunto are added divers Experiments in *Drawing*, *Painting*, *Arithmetick*, *Geometry*, *Astronomy*, and other parts of the Mathematicks. Together with several Curious Receits of Great use, collected out of *Alexis*, *Mizaldus*, *Wecker*, &c.

By *John White* a lover of Artificial Conclusions.

The Sixth Edition, with many Additions.

LONDON,

Printed for *William Whitwood*, next door to the *Bible* in *Duck-Lane*. 1689.

TO
ALL LOVERS
of Ingenious and Artificial Conclusions.

COurteous Reader, (you know and I know, that) the Wits of this Age are acute and various, therefore how to please all mens fancies, is a Task too ponderous for my undertaking. I have here unlock'd and opened to your view a rich Cabinet of varieties; if there be any thing therein contained that may yield you profit, solace of the mind, recreation of the spirits, or content, I shall think my labour well bestowed, and be glad; If it be otherwise, I shall be sorry that I have nothing therein to please your mind, intreating you to shut down the lid again, and then I hope there is no hurt done.

This may be compared to a Garden composed of sundry varieties, wherein you may pick and cull out those Flowers that best please you, and are fittest for your pleasure or profit: For the laborious Bee gathereth her cordial Honey, and the venomous Spider her corroding poison (many times) from the same Flower. And I know that there are some envious Criticks that will snarl at me for publishing many things contained herein; But I care the less, because I aim at the publick (and not my own private) good; and no Man (I think) should be born only to himself, and hide his Talent: And therefore these few Receits which I have collected, with divers of my own (gentle Reader) I dedicate freely to thy use; Knowing that Art imitating Nature, glories always in the variety of things which she produces, to satisfie the minds of curious inquisitors of Natural and Artificial Conclusions. Therefore I doubt not but there are many things contained in this small Volume, that will give satisfaction to the Ingenious, for whose sakes I have compiled it: So taking leave, I will ever remain

An Artist's Friend,

JOHN WHITE.

A Table for the ready finding of each several Receipt in this Book.

How

The Table.

Some few (but choice) Physical Receits, &c

A Table or Heads of the several sorts of Fire-works both for Land and Sea-Service, contained in this ensuing Treatise.

Experiments performed by Legerdemain.

Experiments in Arithmetick.

Pleasant Questions in Arithmetick.

Experiments in Geometry.

Experiments, *&c.*

BOOKS

Several BOOKS *lately Printed for* W. Whitwood, *next to the* Bible *in* Duck-lane.

1. M. *Juniani Justini ex Trogi Pompeii Historiis Externis Libri 44. Omnia quam diligentissime ex Variorum Exemplarium Collatione recensita & castigata in usum Scholasticæ Juventutis, cum Vita ejus ex Gerard. Johan. Voss.* Price One shilling. This Book is now carefully Corrected, with Notes, by a *London* School master.

2. The Wars of *Hungary*, since it was first invaded by the *Turks*, to this time, *viz.* The Relief of *Vienna*, the Taking of *Newheusel*, *Gran*, *Buda*, with the memorable overthrow of the *Turks* on the River *Drave*, the Taking of *Essecke*, and the success of the Christian Arms to this present year 1688.

3. A Collection of Apophthegms or Sayings of Ancients, out of *Plutarch*, *Diogenes Laertius*, *Elian*, *Erasmus*, and others; wherein the Manners and Customs of the *Grecians*, *Romans*, and *Lacedæmonians*, are represented.

4. The *Spanish* History, or Relation of the difference between Don *John* of *Austria*, and Cardinal *Nitard*, are represented with Letters and Politick Discourses between Persons of the highest Quality, relating to that Affair.

5. *Ovid*'s Heroical Epistles, Englished by *W. S.* and illustrated with twenty four Pictures curiously Engraven on Copper-Plates.

6. The Curiosities of Scurvy-Grass, in which are exhibited to publick Use the Preparations of Medicines both Galenical and Chymical, either for internal or external use, in which that Plant or any part thereof is employed; with Figures of all the sorts of Scurvy Grass: By Dr. *Sherley*.

7. Reflections upon Ancient and Modern Philosophy, Treating of the *Egyptians*, *Arabians*, *Græcians*, &c. in French by the famous Monsieur *Rapin*; Englished by Mr. *Loveil*.

8. The Illustrious Lovers, or Princely Adventures in the Courts of *England* and *France*, a Novel.

9

9. The Lives and Actions of several notorious Counterfeits, who from the most abject of the People, have Usurped the Titles of Emperours, Kings and Soveraign Princes; in Twelve several Histories.

10. *M. Juniani Justini ex Trogi Pompeii Historiis Externis Libri 44. Cum Notis Vossii Tristii Bongarii.* Price Two Shillings.

11. The Fortunate, Deceived, and Unfortunate Lovers; three excellent new Novels, containing many pleasant and delightful Histories.

12. The Worthies of *England* in Church and State, illustrated in the Lives and Characters of the most Eminent Persons since the Conquest, being an Epitome of Dr. *Fuller*.

13. A Philosophical Essay, declaring the probable Causes whence Stones are produced in the Greater World; from which is taken occasion to search into the Origin of all Bodies, discovering them to proceed from Water and Seeds; by Dr. *Sherley*.

14. Curious Observations in that difficult part of Chirurgery relating to the Teeth; an account of their Cause, of Corruption, and Putrefaction, with proper Remedies: Considerations on the Tooth-ach, loosness of the Teeth, the use of the Polican or Instrument with which they are drawn on all occasions.

15. A Treatise of Lithotomy, or of the Extracting the Stone out of the Bladder; wherein an Account is given of the various Instruments used, and the Method observed in that curious but difficult part of Chirurgery; illustrated with twenty Figures, curiously engraved on Copper-Plates.

16. The History of the damnable Life and deserved Death of Dr. *John Faustus*, the famous Conjurer of *Germany*, newly Printed from the Correct Copy from *Franckfort* in *Germany*.

17. The History of *Justin*, Translated out of the Four and Forty Books of *Trogus Pompeius*; Containing the Affairs of all Ages and Countries, both in Peace and War, from the beginning of the World, to the Time of the *Roman* Emperours; now Reprinted, with the Life of *Justin*, and the time when he flourished; by *Gerard John Vossius*; Published by *Rob. Codrington*, Master of Arts.

A rich Cabinet with variety of Inventions.

RECEIPT I.

How to make a glorious light with a Candle, like the Sun-shine.

THIS is a rare Conceit, and fit for those Artists, or others that perform curious and fine works by Candle-light, as Jewellers, Ingravers, or the like, or those which are weak-sighted to read by, never dazeling the eye.

Go to the Glass-house, or Glass-shop, and let them blow you a thin round Globe-glass, bigger than a penny Loaf, (the bigger the better) with a short neck like a bottle, they know how to make them. When you have this Glass, with Glew or Wax bind a piece of Tape or Packthreed about the neck or top, making a little loop therewith to hang by; then fill your Glass with the purest Conduit or spring-water you can get (putting some Aqua-vitæ therein to keep it from freezing) stopping it close, to keep the dust out; having thus done, if you will use it at a Table or Bench, knock a Tenterhook or Nail into the Seeling or Shelf, and with a Tape or Pack-threed fasten it to the loop, and hang it up; (but a round stick were better to hang it on, putting it into a post or hole in the wall, that you may let it higher

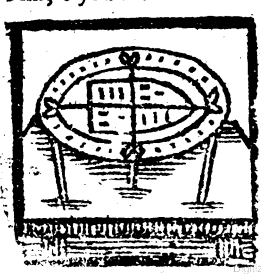
lower at your pleaſure in turning the ſtick: then behind your Glaſs ſet a Candle lighted upon the Table, and you ſhall have a glorious light through the Glaſs and water for your purpoſe; behold the figure following.

Some uſe to place a ſheet of oyled Paper betwixt them and a candle, and this will cauſe a good light.

RECEIPT II.

How (for a Wager) to cleave a thin Groat, or other piece of Silver in ſunder, like two Groats.

THis to many will ſeem impoſſible, yet may thus be done. Take three ſmall Pins, and prick them down upon a board, or table Triangular-wiſe, and then take a thin whole Groat, and lay it level on the heads of the three Pins, as you ſee in this ſame Figure; having thus done, take a piece of Brimſtone and bruiſe or beat it to Powder, covering the Groat therewith all over, in a pretty thickneſs, and then with a lighted piece of Paper, or a candle, ſet the Brimſtone on fire until it be conſumed; when this is done, and the fire out, you ſhall ſee the edges to open a little like a dry Oyſter, then take a Knife and put into it, and it will eaſily

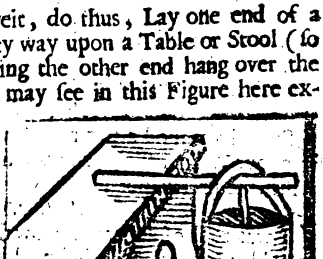


easily cleave in sunder; having the impression on both sides very perfect.

RECEIPT III.

To lay one end of a Staff or Stick upon a Stool or Table, and to hang a Pail full of Water at the other end, having nothing to hold on the Stick, nor nothing under the Pail.

TO perform this Conceit, do thus, Lay one end of a Staff or Stick a pretty way upon a Table or Stool (so that it roul not off) letting the other end hang over the Table likewise, (as you may see in this Figure here expressed) then take a Pail full of Water, and hang the Pail or handle upon the same; but you must have another short stick that will reach just from the inside of the bottom of the Pail, to the long Stick on the Table, placing the short Stick just under the Pail very stiff,



and then shall the Pail of Water hang from the ground upon the long Staves end on the Table without falling, seeming very strange, but this is somewhat difficult at first, till you hit just in the center of gravity: yet I have often done it.

RECEIPT IV.

How to make dainty sport with a Cat.

IF you will have some sport with a Cat, then get a little Bell, such as the tame Hawks have at their legs, and tye the Bell something hard at the end of the Cats Tayl and let her go, the feeling of her Tayl smart, and hearing of the Bell gingle, she will run up and down as if she were mad, flying against the walls and windows: then if she can, she will get into some hole to hide her self, but when she wags her Tayl never so little, then out she comes, and is as mad as before, and never will rest in quiet till it be taken off, or she can get it off her self.

Another.

Some have shod a Cat round, with putting melted Pitch into four Walnut-shells, and placing her feet therein, and she will make pretty sport.

Another.

I was told of a merry Fellow that came into an Ale-house in cold weather, and finding but a reasonable Fire, said, He would make the Cat pis it out, and watching his opportunity, he getteth his Hostesses Cat, putting her head betwixt his thighs, and holding her four feet fast in one hand, and with the other hand held up her tayl near the fire, and did pis such abundance that she quite quenched the same.

RECEIPT V.

How to make very pretty sport with Ducks, or Poultry.

ONE Summers day my self and two or three Friends walked into the Fields for our recreation, and being dry and hungry, we went to a Victualling-house in a Country Village,

Village, where we could get nothing to eat but Bread and Cheese, and sitting in an Arbour, the Womans Ducks being near us, we flung them our parings of Cheese, the Ducks were very greedy of the same, (then quoth one of the Company) I will shew you some sport.

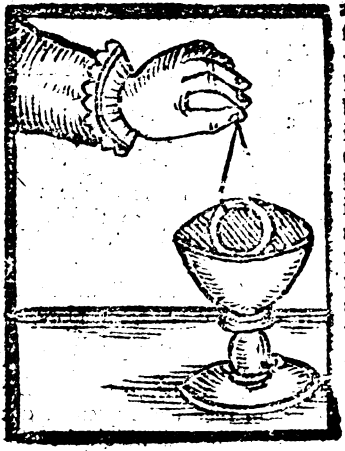
Presently he getteth about a yard of strong threed, and finding a little rag of red cloath, tyeth it to one end of the threed, and at the other end tyeth a piece of Cheese (somewhat lesser than a Bean) with part of the rind on: and throweth it amongst the parings to the Fowle, presently one of them swalloweth it down, now the rest of the threed and the Rag dragged behind her, and she wadling up and down, perceived the red Rag to follow her, of which she was sore afraid, then she did run from place to place, not knowing what to do, at length she took wing and flew into a Pond of Water, and there she quackt, but presently she spy'd the Rag to swim after her, then down she dived, then up again, then down, then up, at length out of the Pond again in her former posture, at which the Woman was amazed and thought her Duck was bewitched. But at the length the threed was tangled at some bush or other, and so broke, or pulled the Cheese out of her Belly, and then she was quiet.

The like sport you may have with other Poultry, by tying a long white Goose-quil, (or a light stick with a rag on the top) upright at her tayl.

RECEIPT VI.

How to know the hour of the day or night at any time, by a Ring and a Glass, being a dainty Clock.

TAke a small threed, and put it through a Gold Ring, or other like Ring, and doubling the threed, tye a pretty big knot at the end, and cut it off, and let the doubled Threed be seven or eight inches long, then take a Bole glass, and set it on a Table, and hold the knot of the threed something hard betwixt the ends of your fore-



and your thumb, as you ſee here in the Figure, which will cauſe the Pulſes of your wriſt to beat; let the Ring hang in the middle of the Glaſs a little within the Rim, then the working of your Pulſe will make the Ring to move, ſtriking upon the ſides of the Glaſs the hour of the day or night, and then the Ring will ſtand ſtill again.

RECEIPT VII.

Another excellent Rule, to know the hour of the Day or Night at any time.

IF any two (or more) Parties be in company together, let one of them take ſomething from the ground, (what they pleaſe) and give it to another Party ſtanding by.

Now, if the thing taken up hath grown, and may grow again, as Seeds, Herbs, or the like, it is then 1. 4. 7. or 10. of the Clock, or very near.

If it did never grow, nor never ſhall, as Stones, Metals, Pot-ſherds, Glaſs or the like, it is then 2. 5. 8. or 11. of the Clock, or very near.

But if it hath grown, and will never grow again, as Sticks, Chips, Shells, or ſuch like, it is then 3. 6. 9. or 12. of the Clock, or very near.

But

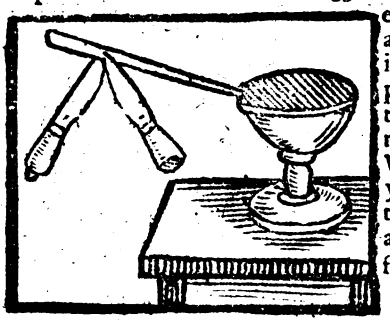
But remember this Caution.

That both they that give the judgment, and they that take up the thing, do not know what hour it is before they try the Conceit.

RECEIPT VIII.

How to make two Knives (with a short stick) to hang upon the brim of a glass without falling.

TAke a little stick, some four inches long, and make it sharp at one end like a Butchers Scuer, and then get two Knives, somewhat of an equal poise, and prick the points of them towards the bigger end of the stick on each side slope-wise, as you may see here in the Figure; then put the small end of the stick upon the rim of a Glass of Wine or Beer, and you may take up the Glass and drink, and they will not fall off.



RECEIPT IX.

How one may put his finger, or wash his hands in melted Lead without danger, or burning.

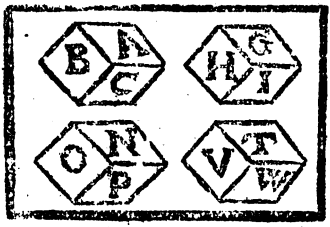
TAke an ounce of Quick-silver, two ounces of good Bole-armoniack, half an ounce of Camphire, and two ounces of Aqua vitæ, then mingle them together, and put them into a brazen Morter, and beat them with a Pestle: h

thus done, anoint your hands all over throughly well with this Oyntment, and then you may put your finger into melted Lead, or you may wash your hands therewith, if one pour the Lead upon them, and it will neither scald nor burn you.

RECEIPT X.

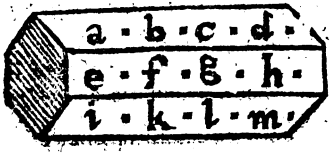
A very pretty and ready way to teach Children or others, suddenly to learn their ABC *in manner of Play.*

CAuse four pieces of Bone or Wood to be cut into six square like Dice, and upon every side or square let one of the Letters of the Alphabet be ingraven or writ; as A.B.C.D.E.F. upon one of them, then GHIKLM on the other, and so of the rest in order, as you may see here in the Figure.



Now the Child taking delight, and using to play with them (amongst other Children) and being told what Letters are uppermost, will soon learn their Alphabet, as it were by the way of sport and Pastime.

Also, you may cause one piece of bone or wood to be made into six long square sides, about an inch and a half of length, and let each side be ingraven, or written with four Letters, as a.b.c.d. and so of the rest of the sides, and let them throw it, and name those Letters which are uppermost; and when they have learned the great Letters, you may write the small Letters on, as it is here on the Figure.



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RECEIPT XI.

An excellent way to teach one to read ſpeedily and truly, that before could not diſtinguiſh their Syllables.

LET a Scholar or one that can read well, take any Book of ſmall value, and at every Syllables end underneath or at the top, with a ſmall Pen of Ink, let them make a little ſpeck or mark: but if the ſpeck or mark were made with ted Ink, it were the better; Or if it be in a Book that you would not deface, then take a ſmall Pin, or Needle, and prick little holes at each Syllable, which will hardly be perceived. This experiment is beſt to be made with hard words of many Syllables, as in the example following.

Abraham, Achitophel, Bartholomew.

Chriſtopher, Demetrius, Anabaptiſt,

Mathematician, Nebuchadnezar, Quotidian, Patrimony, &c.

Theſe to the ingenious will ſuffice, for I have known thoſe which by no means could be brought to read, yet in a ſhort time by this method they have learned to read perfectly.

RECEIPT XII.

Of divers rare and dainty conceited motions, performed by the operation of the Magnet, *or* Load-ſtone.

MAny and wonderful Mathematical concluſions are performed by the *Magnet*, or *Load-ſtone*, only I will give a touch at ſome few for recreation.

Theſe ſtones are to be had at the Ironmongers, but they ought to be poliſhed and made fit by a cunning Artiſt. This ſtone hath his two Poles, one North, the other South, a-

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ſwerable to the Poles of the world. For if you take a piece of Wyre of 4 or 5 Inches long, and touch one end thereof with a *Load-ſtone*, and then thruſt it through a piece of Cork, putting it to ſwim in a Baſon of water, preſently you ſhall ſee one end of the Wyre will turn full North, and the other full South.

This Receipt is profitable for ſome Travellers, who having a Sewing-needle about them that is touched with this ſtone, may prick it into ſome little light piece of Wood or Cork, and place it in the water, and it will ſet out the North and South inſtead of a Compaſs.

If for recreation you take two Wyres, and put each Wyre into a Cork, touch one Wyres end with the North end of the ſtone, and the other Wyres with the South end of the ſtone, and then put them both into a Baſon of water a pretty way aſunder, yet they will begin to move and ſtir, and draw nearer together, and on the ſudden joyn and meet: Now if upon thoſe Wyres or Corks there were placed little paper Tilters on Horſe-back, they would run their courſe at one another in the water very prettily.

Alſo, if this ſtone or *Magnet*, be incloſed in a Box of Wood, Stone, Silver, or Braſs, yet it will extend its operation and working by many pretty and ingenious practices admirable to behold.

As for Example, if you will make the forms and pourtraitures of divers things in thin Paſt-board, as Horſe-men, Foot-men, Ships, Boats, Beaſts, Birds, Flyes, Worms, Serpents, or the like, you may cloſely convey into them a ſhort piece of Wyre, and ſet them upon a Board, Trencher, or Paſt-board, and if you will have them move or walk, then hold the *Load-ſtone* cloſe in your hand, under the Board, and that way which you move your hand underneath, that way the images will move and creep on the top.

Alſo, if you place the *Load-ſtone* privately to, or near the Seeling, or over a Door, and then hold a piece of Iron near to it (tying a thread to the Iron) that it touch not the ſtone, which will attract it, and then the Iron will ſeem to hang in the Air. If you touch an Iron Ring with this ſtone, it will take up a dozen or more Rings together,

hanging

hanging one to the other like a chain. Alſo if a knives point be touched therewith, it will take up Needles or Wire, and by it you may know the counterfeit, or Newgate half-penny, as ſome call them.

Many other rare concluſions may be performed by this ſtone, which I forbear to write of. Fire, Garlick, or Onions, ſpoileth the vertue of this ſtone; therefore let it not touch or come near them.

RECEIPT XIII.

A pretty way to catch Kites, Ravens, Crows, Magpies, or the like, alive.

GO to the Apothecaries, and beſtow two pence in *Nux vomica*, then beat it to powder, or ſlice it as you do Ginger; this being done, take raw Fleſh or Liver, and cut it into little pieces or gobbets, that the Fowl may ſwallow them whole, then cut holes in the ſame, and put your powder or ſlices therein, and then lay theſe pieces where they haunt, but as ſoon as they have ſwallowed down the ſame, they will flie to the next high Tree they can come at, and this preſently makes them ſo drunk, or ſick, that they ſtreight will fall down from the top of the Tree to the ground, that you may take them up alive with your hand: But you muſt be ſure to watch them and run preſently to the Tree, for they will ſoon recover and flie away.

I believe if it were ſodden with other Grain, it would have the like operation with other Fowl.

RECEIPT XIV.

A ready way to catch Pidgeons, or other Fowl.

TAke pieces of brown Paper, and roul them round, making Coffins of them, ſuch as the Grocers make to put their Fruit in; let them not be above a finger long, paſte the ſides

a-

and ends of them with some starch, clip the upper part of them round with a pair of Sheers, then anoint the inside of the uppermost skirts of them round about with Birdlime, or some stuff that will but cling to the Feathers: But you must (a day or two before you use it,) lay or strew some Pease or other Grain to make them haunt the place, and they will be the less fearful; then if you please, make a hole in the ground a little way, and put your Coffins upright or sloping therein a few Peason or Corn in them, strewing here and there Peason near them, and when she picketh into the Coffin, she is immediately hooked, and blindfolded, not seeing which way to flye; and thus you may take them easily.

RECEIPT XV.

A merry Receipt, being a ready and sure way how to catch a Pick-Pocket.

AS I was writing the former Receipt, it put me in mind of a pretty conceit that a friend once related to me, which was thus: A Gentleman being in a throng in a Fair, had his Purse pickt out of his pocket, he missing it, was somewhat vext, but could not mend it, but studied how (if he could) to be revenged: presently he buyeth two pennyworth of Fish-hooks, and causeth a Taylor to sew them round about toward the upper part of his pockets, with the points of them down-wards, and so the next day away he goes to the Fair again amongst the throng, throwing his Cloak on one shoulder, seeming careless of his pockets, wherein he had store of Money: Presently there was a Diver nibling at the bait, and nimbly had his hand in his pocket: The Gentleman being wary (perceived that the Fish had swallowed the hook) gives a jerk aside which caused the hooks to catch good hold in his hand, and then he had him sure: Then said the Gentleman, Fellow what maketh thy hand in my pocket? O good Sir, (replyed the pick-pocket) pardon me, I cannot pull it out. Come (faith

(saith the Gentleman softly to him, because no body should take notice) go along with me; So cheek by joll they walked together, with his hand fast in the pocket (but covered with his Cloak) and to the Tavern lovingly they go together, where the Gentleman told him of the loss he had sustained the day before, and making of him to restore back his money, he cut out his pocket, and let him go. Surely this pick-pocket had good store of picking work to get the hooks out of his hands again.

RECEIPT XVI.

How to make Fowls and other small Birds drunk, that you may take them with your hands.

YOU must observe what meat they love or use to eat, as Wheat, Barly, or other Grain, and lay the same to steep in the Lees of Wine, or in *Aqua vitæ*, or in the juyce of Hemlock, and strew the same Grain in the places where the Birds do haunt.

Another.

Take Tormentil and boyl it with strong Wine, Wheat, Barly, or other Grain, then strew this in those places where you intend to take them, or where they use to haunt, and the Birds will eat the pieces among the grain, which will make them so drunk that they cannot flye away.

Another.

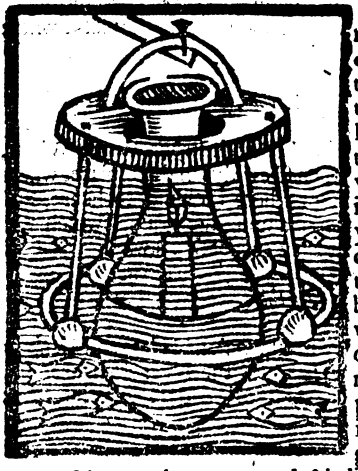
Make Past with Barley meal, Onion blades, and Henbane seeds, and put or throw it where the Birds do haunt.

These experiments are best to be done in Winter in a deep Snow.

RECEIPT XVII.

A dainty way to catch Fish in a dark night, with a Candle under Water.

GEt an Urinal, and put pretty soft Clay therein, and with something that is flat at the end press the clay gently to the bottom of the glass, smoothing it as well as you can, then take a stick and shape it about the bigness of a Candles end, wet the stick, and put it into the neck of the glass, making a hole in the middle of the clay, as you make clay candle-sticks; then make a little hoop of a Willow stick, and tie pieces of cork in four places of the hoop equally distant, and get a thin light round piece of board, and with four little sticks of an equal length, tie one end of them to the Corks, and the other ends fasten to the board to support it, as you may see here in this Figure.



In the board you must make a hole in the middle to put the neck of the glass through, and there tie it and make a loop with a string to the board that you may with a long pole put it into the water: when you will use it, put your candle into the glass in the clay socket, a little below the brim, that the wind blow not the light out. If you please you may with wax or glew put little pieces of looking glasses, or other glass under the board, on the side next the water, and this light will shine a great compass in the water, and the Fish will streight resort

to

to the ſame, where you may very eaſily take them with a Net.

This might be done with the Glaſs alone, by tying Corks about the neck of the Glaſs, to keep the mouth above water.

RECEIPT XVIII.

An excellent Bait to catch Fiſh with an Angle.

MAke Paſte with fine Wheat-flower, tempered with a little Saffron and Sugar, and bait your hook therewith, and they will bite apace. This is a good bait for Roch, Dace, and ſuch like.

Another.

Take the crum of a new penny White-loaf and an ounce of *Coculus India*, and an ounce of Henbane ſeed finely powdered, temper the ſame well with good *Aqua-vitæ* into a Paſte, and divide them into ſmall pieces bigger than grains of wheat, and then caſt handfuls in at once into the water where is ſtore of Fiſh, and you ſhall preſently ſee the operation of the ſame.

RECEIPT XIX.

How to make one watching Candle, that it ſhall out-laſt three Watching Candles.

TAke a Pail, or Bucket, and fill it full of water, and ſet it in the place where you intend that your light ſhall ſtand: then take your Candle and warm it at the lower end, and there ſtick a braſs farthing token, or ſuch like; and when you will light your Candle, put it gently down into the middle of the water, (but be ſure that the bottom of the Candle do not touch the bottom of the Pail

and then it will swim upright to the very edge near the light. The reason that the Candle will last so long is caused by the coldness of the Water; and this is a sure way that no Rat can run away with the Candle lighted, as I have heard that they have done; by endangering the House with fire.

RECEIPT XX.

How to write any name or mark upon a Paper, and then burn it to ashes, yet afterward it may be read plainly.

TAke a new clean Pen that was never written withal, and dip in your own water as you do in Ink; then strip up your Shirt-sleeve above your Wrist and upon your arm write your name, or any name or any mark, and then let it dry on your skin, and nothing will be seen, then put down your sleeve and button your wrist. (Do this privately, and it will cause some to wonder:) then take a piece of white Paper, and write your name or the mark thereon, with another Pen of black Ink, (but let it be written as like the other as you can) then take the Paper and burn it, and lay the ashes on a Table, and stripping up your sleeve, rub the ashes hard with your finger, where you had written with your water, then blow off the ashes, and the name or mark will plainly be read on your arm in black Letters.

RECEIPT XXI.

How to view the back part of your head by Glasses.

IF you would behold the back part or shadow of your Head (for a wound, or the like) take a Looking-glass and hold it behind your head, and then take another Looking-glass and hold it before you, and from the Glass behind, you may see your shadow in the Glass before you.

RE-

RECEIPT XXII.

A pretty trick to tell, or name all spots or court Cards in the Pack, and yet never see them.

YOu must privately drop a drop of water or drink (about the bigness of two-pence) on a table before you where you sit, and let any body shuffle the Pack of Cards, and then taking them into your hand, place a candle on the table before you (for this trick is best to be done by candle-light) and holding down your head (as you may see in the Figure) lift the Cards above the brim of your Hat, close to your head, that the light of the Candle may shine on the Cards, then in the drop of water (like a Looking glass,) you shall see every speck of each Card before you draw them, which you may name; or putting your finger upon the spots, you may say that you feel them out; then lay down your first Card, and name the next, as your first Card was the Deuce of Clubs, the next is the five of Spades, and so of the rest.

RECEIPT XXIII.

How to keep or preserve any Fowl, Venison, or other pieces of Flesh, sound and sweet for three weeks, or a month together, although the weather be never so hot.

MAke a strong Brine with Bay Salt and white mingled together, so as the water be over glutted with Salt, and being scalding hot, parboyl therein the Fowl, or Flesh which you intend to keep for some reasonable time, (that is to say, according to the greatness and greasiness thereof,) then hang it up in a convenient cool place, and it will last a sufficient time, without any bad or over-saltish taste.

This is a good way for Sea-men, and others in hot countries, who are inforced sometimes to victual themselves in such intemperate climates where no flesh will last sweet four and twenty hours together, by reason that they have no means to make the same to take Salt, which without question will enter this way and make penetration very speedily, by reason of the hot and fiery spirit of Salt thus prepared.

RECEIPT XXIV.

How to make a speedy or present Drink that Travellers may brew for themselves, when they cannot relish their Beer or Ale at their Inns.

TAke a quart of good water, put therein five or six spoonfuls of good *Aqua-vitæ*, and an ounce of Sugar, with a branch of Rosemary, brew them a pretty while out of one pot into another, and then is your drink prepared.

RE-

RECEIPT XXV.

How to make on the ſudden, good drink for Mariners, Soldiers, or for poor people, when Beer is ſcant, and Malt dear.

IN time of extremity, theſe things following will ſerve to ſuffice nature (as hath been often proved;) put a good quantity of wholſom fair water, a ſmall portion or few drops of the Oyl of Sulphur, incorporating them well together, and it is ready.

Another.

One drop or two of the Oyl of Vitriol added to a good quantity of fair water, and well ſtirred together, performeth the like.

Some mingle Vinegar with good water, and it ſerveth very well to quench the thirſt.

Others will carry a piece of Alom in their pocket if they are to travel, and know not how to get drink or water, and when they are a dry, they put a piece of that in their mouth, and it will fetch up moiſture which will aſſwage the thirſt.

RECEIPT XXVI.

A profitable way to harden Leather, that it ſhall outlaſt other Leather a long time.

THis is a good and profitable Receipt for many poor labouring men, and is thus performed; Take and lay ſuch Leather as is well tanned to ſoak in water, wherein there hath been ſome ſtore of filings of Iron, a long time, or elſe in the water that hath long lain under a Grinding-ſtone, into which ſuch Iron as hath been from time to time ground away, hath there ſetled.

This is good alſo to harden Leather for the Cawkers or Pumps of Ships, or others, to make them laſt long.

RECEIPT XXVII.

An Excellent Receipt to make a dainty ſtreight Walking-ſtaff to have knots where you pleaſe.

GEt a ſtreight piece of wood (of your deſired length) of Holly, Aſh, Service-tree, Walnut-tree or Pear-tree, let it be free from knots, or ſhakes, then plain it into ſix or eight ſides, a good deal bigger than your Staff ſhall be; this being done, get a ſhort Punch of Iron, and let the ſmall end be filed about the bigneſs that you intend your knobs ſhall be, filed about a bench or table, and where you will make the knobs with a hammer punch holes therein, and ſo do on every ſide, then plain it over again till you have made your ſtaff ſmooth, that there be no dents ſeen thereon; when you have thus done, put it into ſome cauldron of boiling water for a good ſpace, and when you take it out again, you ſhall ſee that it will be full of knobs, for with the heat of the water it forceth the bruiſes (which were made with the Punch) to ſwell out of the wood again.

You may file your Punch like a Star, or other work, and it will ſhew very pretty; I once ſaw a Partizan, or Captains Leading ſtaff, which was done in this manner, and being put into a Dyers Cauldron when he dyeth blacks, when it was dryed, and rubbed well with Linſeed oil, it ſhewed like Ebony.

RECEIPT XXVIII.

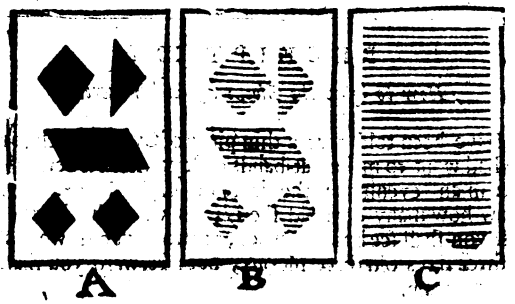
How to write a love-letter ſecretly, or from one Friend to another, that cannot be diſcovered.

TAke a ſheet of white Paper, and double it in the middle, then cut holes through both the half-ſheets, let the holes be cut like the panes of Glaſs-windows, or other forms what you beſt fancy, and then with a pin prick too little holes

holes at each end, and cut your paper in two halfs, give one half to your Friend (to whom you intend to write) the other half keep to your self: Now when you do write, lay your cut paper on a half-sheet of writing paper, and stick two pins through the two holes that it stir not; then through those holes that you did cut, write your mind to your Friend; when you have done, take off your paper with the holes again, and then write some other idle words both before and after your lines, but if they were written to make some little sense, it would carry the less suspicion; then seal it up and send it.

When your Friend hath received it, he must lay his cut paper on the same, putting pins into the pin-holes, and then he can read nothing but your mind which you writ, for all the rest of the lines are covered, observe the Figure, and it is easily apprehended.

Where the Letter A is placed, that doth signifie the half-sheet of cut paper with holes; where the Letter B is placed, doth signifie the substance of the Letter which you write, and where the Letter C is, doth signifie the Letter filled up with lines to joyn to the other words. Now when your Friend writes to you, he must do the like.



Another.

Write a Letter (what you please) on one side of paper with common Ink, then turn your paper, and write on the other side with milk, (that which you would have secret) and let it dry; (but this must be written with a clean pen:) Now when you would read it, hold that side which is written with Ink to the fire, and the milky Letters will then show blewish on the other side, which may be perfectly discerned.

RECEIPT XXIX.

How to know when the Moon is just at the full, by a Glass of water.

TAke an ordinary Drinking-glass, and fill it full of water up to the very brim, so that it doth not run over, let this be done a little before that the Moon be at full, and then at the very instant that the Moon is at the full, the water will presently boyl over.

RECEIPT XXX.

How to know the Moons age at her Increase.

I Have been told, that a thin piece of Cypress, such as they had wont to make Hat-bands of, if you hold it before your eyes in an evening at the increase of the Moon, you shall know how many days old she is; As when she is one day old, you shall see but one Moon, at two days old two Moons, at three days old three Moons; but afterward you shall see but one again.

RE

RECEIPT XXXI.

A dainty way how to fetch Oyl, or Greaſe, out of Books, writings, Papers, or Garments.

GO to the Apothecaries or Grocers, and buy a penniworth or two of the Oyl of Turpentine, and put a drop or two upon the place which is Oyly or Greaſie, rubbing it on, and then you ſhall ſee how it will drink up the Oyl or Greaſe, and be preſently dry and fair; for this Oyl of Turpentine is a great dryer, and is good to put amongſt Oyl colours, to make them dry ſpeedily.

RECEIPT XXXII.

How to refreſh and ſcoure old pictures, that are wrought in Oyl, making them to look almoſt as freſh as if they were new done.

TAke the Picture out of the frame, then wipe, or bruſh off the duſt very clean, and then lay it level upon a board, or table, pouring good ſharp Vinegar all over the ſame, and there let it lye and ſoke for three or four hours; if the Vinegar be dryed up, then pour on more, continually keeping it wet: then beat a piece of dry brick very fine to powder, (and ſee there be no lumps or ſtones therein, for they will raze and ſcratch the Picture) and then put the powder into a courſe linnen rag, and tye it, and then dip it well in a Porrenger of Vinegar, and with your rag and powder, rub and ſcour your Picture all over very hard, and then with fair water or a wet clout, waſh the filth away: But if you ſee any ſpots or filth remain, then ſcour it again and waſh it; then dry it very well with a cloth, and when you have dryed it, put it again into the frame, and ſet it in the Sun for a day or two, (for the Sun refreſheth the Colours very much) and then rub it hard with a dry wool

len cloath till you make it ſhine, and then hang it up. This will cauſe it to look almoſt as freſh as when it was new.

Some uſe to waſh them in Soap, and then Oyl or Varniſh them over, but that is not good, becauſe that the Oyl or Varniſh will turn yellow, and gather duſt.

RECEIPT XXXIII.

How to keep Sword-blades, Halberts, Piſtols, Knives, Edge-tools, or other things free from ruſting for ſeven years or more, in a dry houſe.

TAke Fiſh Glew, or Iſing-Glaſs, and cut it in pieces, then with a Hammer beat or bruiſe it upon an Anvile, or ſtone, and then put it into a little skillet, or ſuch like, with water, and let it diſſolve over a gentle Fire, ſtill ſtirring it as you do your common Glew; then when it is well boyled take it off, and with a *Pencil*, or ſmall hair-bruſh, lay the ſame, while it is hot, all over your Sword-blade as thin as may be, and then lay it to dry, and it is done. This thin coat keepeth the moiſtneſs of the Air from the Mettle, that it cannot ruſt; but when you are to wear it or uſe it, take a blunt knife, and you may eaſily ſcale off the thin ſubſtance, and then it will be as bright as any Silver.

I verily believe, that our common Glew will do the like, keeping of it in a dry room.

RECEIPT XXXIV.

An excellent Cement for broken Glaſſes, China-diſhes, or Cups and ſuch like.

TAke one part of Virgin-wax, and two parts of the tears, or clear drops of Maſtick, melt them together and Cement therewith. But the better is, if you beat the whitiſh Fiſh-glew or Iſing-glaſs with a hammer till it begin to be

clear

clear, and then cut the same into very small and short pieces, and dissolve and melt the same over a gentle Fire with *Aqua-vitæ*; then let one that standeth by, hold both the pieces that are to be cemented over a chafing-dish of coals till they be warm; and during their heat, lay on the dissolved Glew with a fine Pencil, then bind the Glass with Wyre, or Pack thread, to keep it steady, and so let it remain till it be cold and dry.

Another.

Take a little quantity of unslaked Lime, wheat-flower and the white of an Egg, and incorporate them together. Mastick, *Aqua-vitæ*, and white Lead is good; so is Isinglass, being dissolved and melted with Rhenish-wine.

RECEIPT XXXV.

How to graze Arms, Posies, or other devices upon Eggs, which may be served at a Table.

MElt Suet pretty warm, and dip in your Eggs in this manner, hold the Egg between your thumb and your fore finger, and quickly dip one half therein, and hold it in your hand till it be cold, and then dip in the other end that is be thinly covered all over, then take a little Bodkin or needle, and grave in the Suet what Letters or Words you please, then lay the Egg thus ingraven in good wine-vinegar, or other vinegar in some stone Pot or Vessel for the space of six or eight hours more, or less, according to the strength or sharpness of the same, then take out the Eggs, and in hot water dissolve the Suet from the Shells, then lay the Egg to cool, and the work will appear to be graven in the shell of Russet colour. And if the Egg lye long enough in the Vinegar after it is so graven, the Letters or Works will appear upon the Egg it self being boyled, and so you may serve them up at the Table. And if you care not to lose the meat, you may pick out the same, w[illegible]

the ſhell is through graven, and you ſhall have a ſtrange piece of work performed on the ſame.

RECEIPT XXXVI.

How to make wax either red or green.

TAke to one pound of Wax in Summer, three ounces of the cleareſt Turpentine; but if you make it in Winter, take four ounces of Turpentine, melt theſe together over a ſoft fire, ſtirring them with a ſtick, and when they are well melted together, take it off, and let it cool a little, and then mix with the ſame the red roor of *Anchuſa*, or Vermilion ground an ounce, and an ounce of ſweet Oyl; ſtir theſe well together again over the fire, then take it off to cool, and pour it into cold water, and then upon a wet board, and your hands wet, you may roul it into what form you pleaſe. Inſtead of Vermilion, you may take three times as much Red-lead, but that is not ſo good.

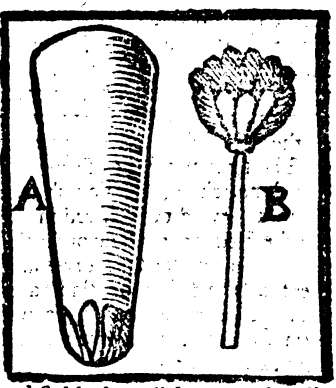
If you will make Green wax, inſtead of Vermilion take the like quantity of Verd'greaſe.

RECEIPT XXXVII.

A pritty way how to caſt off Flowers in wax, of divers colours.

CAuſe a Stick to be turned round at one end, (ſomewhat Taperwiſe) like the faſhion of a Poking ſtick, leſſer, or bigger, (according to the bigneſs of the Flower you intend to caſt) and at the ſmaller end thereof, with your knife, cut tents or nicks in the ſame, long-wiſe as you

ſee



see here in this Figure; The letter A. signifieth the Stick, the letter B. signifieth the Flower: then take a little panikin, & in the same melt your Wax with a gentle fire, and when it is melted take it off, and then take your Stick (having a Porrenger of fair water by you) and dip the end into the water, and then shake off the water, or suck it off, and then dip the stick into the Wax, and suddenly pull it out again, dipping it into the water again to cool it, and then you may take off your flower and lay it by: and in this sort you make as many as you please: for yellow Flowers, melt yellow Wax; for Red, red wax; for white, white wax; for green, green wax. Now for stalks for your Flowers you may stick in a small wyre, or a Bent of a raison-frail, or the like. You may have the coloured wax ready made at any of the Wax-chandlers.

RECEIPT XXXVIII.

How to make a bunch of Grapes with Green Wax, that will seem to be natural.

YOu must get a little stick turned round at the end, about the bigness of an Arrow; and then have your vessel of green wax melted, (as was shewn in the former Receipt,) dipping your stick in the same about the third part of an inch deep, and it will be almost in the fashion of an Acorn cup, make a good many of them. Then take an Egg, and make a little hole in the bigger end of the shell, less than a penny, and get out the yolk thereof and dry the

ſhall; then with a piece of your green wax hold it to the fire, rub or daub the ſhell therewith thinly all over, then hold the ſhell in your left hand, and with your other hand take up firſt one cup, holding the ſame a little near a candle to warm, and quickly ſtick it on your egg, and ſo do with all the reſt of the cups, till you have filled it all over; they muſt be ſet ſomething cloſe together. Now when you have thus done, take a little ſtick, about the bigneſs of the tag of a point, and tye a pack-thread in the middle thereof, and then put the ſtick into the hole of the ſhell, and ſo hang it up; You may cut leaves like Vine leaves in green paper; and faſten them to the ſtring or ſtalk above the bunch: I have made ſome womens teeth to water at this conceit, they ſeem ſo natural to the eye; and theſe Grapes will laſt all the year.

RECEIPT XXXIX.

How to grave and in-lay Colours into Gold, Silver, Iron, or Copper, to ſhew like Ammel.

FIrſt, cover your Mettal with a cruſt of warm Wax, and when it is cold, with a fine ſharp bodkin draw, or cut out the ſhape or proportion of what you pleaſe, either Letters, Flowers, Borders, or Scutcheons, of reaſonable largeneſs: then pour upon the ſame empty places (which you have ingraven upon the wax (ſome few drops of ſtrong water or *Aqua-fortis*, and let them lye a while, and when you find them deep enough graven, mingle Orpiment and Maſtick melted together for a yellow colour, and Vermilion and Maſtick for red, and Bice and Maſtick for a blew, and Ceruſe for white, and Ivory burnt for a black. Now when your Maſtick hath been melted with any of the foreſaid colours, let it cool, and beat the ſame into powder, and lay the ſame powder within the graving, and after lay the mettle upon a ſmall Char-coal fire till the Maſtick be melted, and it will remain faſt and firm therein a long time.

RE-

RECEIPT XL.

How to In-lay Boxes, Cabinets, or other things with hard Wax.

With a pen draw upon your Box any thing what best pleaseth your fancy, as Birds, Beasts, Flies, Flowers, Fruits, Leaves, Travls, Anticks, Letters, *&c.* Then take a little knife ground sharp at the point, and cut or grave out the work pretty deep which you have drawn with your Pen upon the wood; when you have so done, lay upon the same some red or green hard wax, and with a hot Iron melt and rub hard the wax all over into the crevices, or works which you have cut out, and so let it cool: then take a knife and scrape away the wax to the board, and then you shall have your work which you drew, to be in-laid very perfectly in the colour of your wax, as though it were drawn with a Pen, and will never wash nor wear off, when you have scrap't it clean, hold it a little to the fire, and it will fetch a gloss on the wax, and make it to shew the pleasanter.

RECEIPT XLI.

How to harden the white of Eggs into an Artificial Gum fit for many uses.

Separate the Whites of Eggs clean from the yolks, and beat the Whites very well into a clear oyl, or water, and when it is settled, skim off the froth; then put the same into Bladders, and hang them in a chimney-corner, where fire is usually kept to dry, and in a few days the same will become as hard as Gum Arabick: in hot weather you may hang your Bladders in the Sun to dry: This Gum may be used in stead of other Gums, and with it you may varnish Prints, or other things that are washed in colours.

RE-

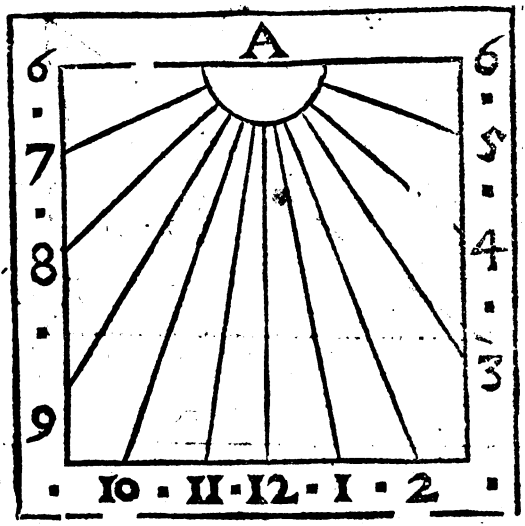
RECEIPT XLII.

How to make a true South Sun-dial, to be placed upright against a Wall or on a Pole.

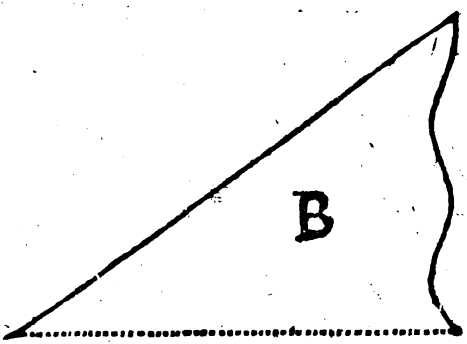
I Intend not to speak of the multiplicity of Geometrical and Artificial sorts, and making of Sundials, (of which many ingenious Artists have copiously written (but a Mechanick way of two sorts, for the benefit of some who would be glad to know how the hours of the day pass away.

Take a piece of good writing paper, and rub it over with Linseed-oyl, and hang it to dry in the Sun, when it is thorow dry, take and lay it over this print of the Dial (or some other of this nature) that you may see the hour lines through it, holding of it fast from stirring, (which may be done by pinning it to the margent,) then at the center by the letter A. stick a Needle or pin upright, and laying a straight ruler close to the pin draw all those hour-lines which you see through the Oyled Paper; then take off the paper, and when you would mark out a Dial, do thus: get a board of what size you please that is smooth plained, and will not warp, drawing a streight line just down the middle thereof, and lay this paper thereon, and then put your pin thorough the center hole toward the top of the streight line on the board, and put another pin towards the bottom of the line, which is your 12 a clock line, bodkin prick a hole through every hour-line of your paper into the board, and then take it off; then stick your pin into the center hole of the board again, and laying the (these two pins keep your paper steady,) then with a small ruler close to the pin, and close to each hole in the board, mark and draw your hour-lines; (and note that you may extend these hour-lines to what length you please, according to the bigness of the board;) and then figure it as you see in this example following.

Now



Now for the Cock or ſtile of your Dial, it muſt be ſet in the 12 hour line, and muſt be juſt equal in height from the board, as the triangular Figure marked with B. ſheweth; the line with pricks is but to direct you which ſide muſt be next to the board: The Stile may be made of a thin Iron plate, and cemented in, or of a ſtiff wire; the upper end of which muſt be put juſt to the center by A. equal to the 6 hour line: when this is done, you muſt get ſome Painter to paint it to in Oyl-colours, and ſo ſet it up.

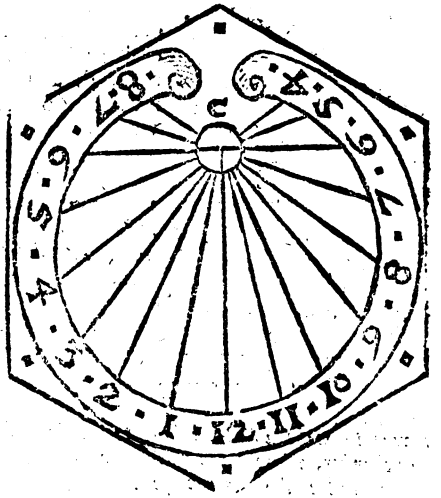


RECEIPT XLIII.

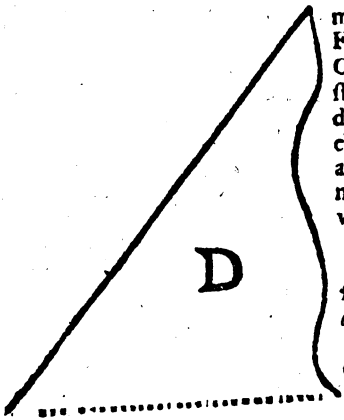
How to make a Horizontal or Flat Dial, to ſtand upon a Poſt, or other place.

THis Dial may be made into ſundry forms, either four-ſquare, ſix, or eight ſquare, or round as you pleaſe, and it is to be placed on the head of a Poſt; either in Garden, Yard, or at the out-ſide of a Glaſs-window where the Sun cometh: behold the form.

You



You must note, that the hour-lines of this Dial do vary from the former, and so doth the Stile in height: But you must work with this as in the other with your oyled paper, to draw the hour-lines, and to make a line just in the middle for your 12 a clock line. The center of this dial is hard by the letter C. and must be more near the middle than the other, because it containeth more hours thereon, for the other will serve but from 6 to 6, but this from 4 to 8. You may make this Dial in Stone, Wood or Metal, and remember to make the height of this Stile or Cock according to this triangle marked with the letter D. for it must be higher, as you



may perceive by this Figure. You may make Cement for to fasten the stile, with Rozen, powder of brick and some chalk, mingled together, and with a hot Iron melt it into the crevise.

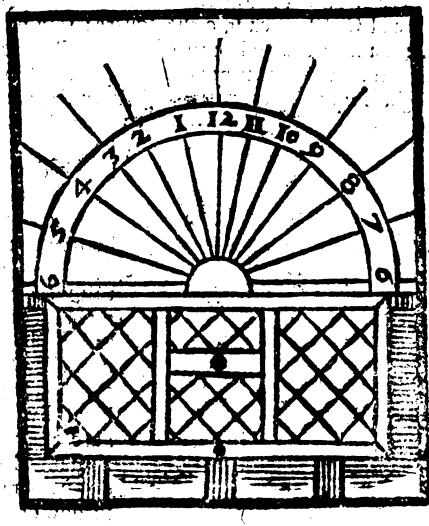
Note, That these Dials will not serve in any part of England, *but within* 10 *or* 20 *miles of* London.

RECEIPT XLIV.

A pretty way to make a Sun-Dial on the Cieling of a room, or chamber, whereby you may know the time of the day, as you lye in bed.

IF you have any window South-East, or South, which is best, and that is for your turn, in the lower post or frame of the inside of your window, about the middle, fasten with wax a little round piece of Looking-glass, or other glass, about the bigness of a two pence, (you may cut it round with an old pair of Scizzars; but if you place it higher in your window on a ledge, it will be the better, (as you may see here in the Figure,) setting it level with the Horizon; and the reflection of the Sun in the Glass will shew on the Cieling the hour of the day, the center of the Dial will be without the window and not perpendicular to the Glass. This Dial must have no Stile, and it must be made like the last Horizontal Dial: you may draw the circle, hour-lines, and figures with a pencil or coal, the black spot is the piece of Looking-glass, the Dial is the cieling.

R E-

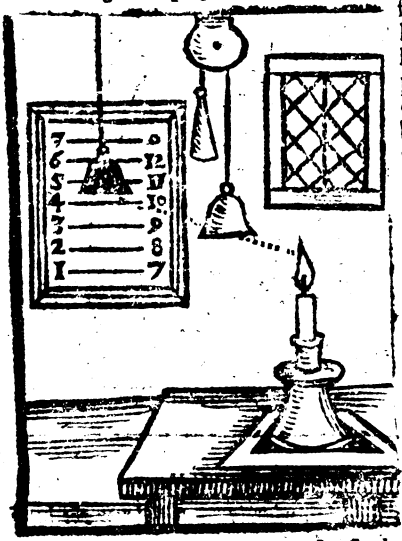


RECEIPT XLV.

How to make a Candle-Dial, whereby you may know the hour of the night.

ONe Winters evening sitting by the fire, me thought there might be some device for a Candle-Dial; at length it came into my head, I made a little four square frame of Wood, of a piece of a thin Trencher, making the inside thereof fit for the bottom of a Candle-stick to stand in, which I did ordinarily use; on two sides of the square I fastened a little piece of Wyre, not a quarter of an inch long, and just where the Candle-stick should stand, on a Table or Board, I made two little holes with a Bodkin for

the ends of the two Wyres to go into, and then I ſet down my Candle and Candle-ſtick into the ſquare: Having thus done, I made a long Frame like the Frame of a Picture, and paſted half a ſheet of white paper therein upon a thin board, and ſo hang'd it up againſt the wall; Then in the Cieling I faſten'd a ſmall Pulley, & on that Pulley I had two little plumets of lead, one broader at the bottom than the other, & ty'd them to a piece of Packthread at each end, and ſo hung them in a Pulley, (as you may better apprehend by the figure, the broadeſt Plummet I pulled down till it gave a ſhadow on the lower end of the paper in the frame on the wall, (which is now the 1 & 7 a clock line,



and where the broad bottom caſt a ſhadow I made a ſpeck with my pen, and then turned an hour glaſs, and when that was run out, I made another ſpeck, which is the 2 and 8 line, and ſo of the reſt: by theſe diviſions, you may with a pair of compaſſes divide the reſt of the hour line upwards, you muſt Pull down the broad Plummet and ſet it at any time to what hour you pleaſe, as by this, it ſhews that it is half an hour paſt 4 or 10 of the clock. You muſt remember to have your candles always of one ſize or weight, as of the eights, or twelves in the pound, or ſuch as you uſually burn. You may take away your Candle and candleſtick out of the ſquare frame if you have occaſion, and then ſet it down in its

its place again, which keeps all right. I have placed the Figures at each end of the hour-lines, as from 1 to 7 on the first side, and then from 7 to 12 on the other side. Note when it is just 7 on the first side, then pull down the Plummet to 7 on the other side, which I hold to be the best way.

RECEIPT XLVI.

How to keep Cherries, Pears, Nuts, or other Fruit a year as fresh as they came from the Tree.

WHen they are pretty ripe, cut off the stalks, and put them into an earthen pot well leaded, and then cover them well with Honey, then stop the pot with Pitch, or wax, that no ayre may enter in, and then put the pot in some Cellar, or cool place, burying it well in Sand; and so let it remain till you use it.

RECEIPT XLVII.

How to make Grapes, and other Fruit to have no stone or kernels.

IT is said, that if you do plant or set the smaller end of the twig of a vine some-what deep into the earth (which will take root (that those Grapes that will grow thereon shall have no stones: the like effect have peaches, Apricocks Damsons, and other Stone-fruits, if the small end of the cyons be grafted into the stocks. Also if you bend down both the ends of an apple or pear-tree cyon, and graft them on both sides of the stock; and the next year when they have grown, cut the cyon in the middle, one shall bear fruit with kernels, the other none.

RECEIPT XLVIII.

How to make yellow Roses grow, and to make Trees and other things grow green all the year.

I Have been informed, that if you graft a white Rose upon a Broom stalk, or on a Furzen bush, that the same will bear yellow Roses, but they will have no sweet scent.

Also, if you will graft a Rose, or other thing upon a Holly-stock, the leaves of the same will grow green all the year.

RECEIPT XLIX.

How to make Apples, Pears, and other Fruit of several colours, and to give them a dainty taste of Spices.

IF you will give a pleasant colour to your Fruit, do thus; For a red, boyl Brasil, Turn-soyl or Sanders, and for a yellow, use Saffron, or Turmerick. Now to give them a dainty taste and smell, you must beat Cloves, Mace, Cinnamon, and Nutmegs, to powder, and mix them with the water of your colours with some honey; then with an auger bore a hole in the biggest part of the tree, unto the middle, some-thing shaping downwards, and then pour your water and spices into the hole, then with a pin made of the same Wood, or tree, beat it hard into the hole, and saw off the end, and wax it about: This must be done in Winter before the Spring, because when the sap riseth, the colour, scent, and taste also ascendeth with the same.

RECEIPT L.

An excellent way for baking of Bread that it shall not be hard crusted, nor yield so many crums.

GO to the Plate-worker, (such as maketh ordinary Dripping-pins) and cause him to make a pot, or Pots of his

his Latten-plate, which may contain half a peck, or greater, or leſs, as you pleaſe, according as you mean the bigneſs of your Loaf ſhall be; let this pot be made with a bottom at the lower end, and open at the top, almoſt like a beaker, as you may ſee here by this Figure, and when it is done, take a little Butter, and anoint the in-ſide of the pot therewith, and when your Dow is moulded, put it into the ſame, (not full to the top) and thruſt it down hard to the bottom, and then ſet it into an oven amongſt other bread, with the leſſer end downward; and when it is baked, it will eaſily come out: this Loaf will have no hard cruſt, nor crum as other Loaves do, and will ſhew ſmooth, ſtanding like a Sugar-loaf upon the Table, and in a little compaſs.

RECEIPT LI.

A dainty, ſtrong, and gliſtering Mortar, or Plaſtering for Cielings, or for Walls.

IT is ſaid that in *Italy* they much uſe this Conceit for Plaiſtering of their Cielings, Floors, or Walls, which is by mixing and well tempering together Oxen and Cowes blood with fine Loam or Clay, and it will be a very ſtrong and binding ſubſtance, and being well ſmoothed it will gliſter, and become very hard.

RECEIPT LII.

How to give ease, and help the raging pain of the teeth without drawing.

THis is also performed with the spirit of Wine, or good *Aqua-vitæ* (as you have read in the former Receipt) by pouring it into the ears, especially on that side where your pain lieth: but after that you have let the water run forth of your ears, then with more of the same water (against the fire) you must rub and chafe your cheeks, and under your jaws, and behind your ears, stroaking of them upwards with your hands toward the neck, to drive back the humours: for it is nothing else but a cold rheum that distilleth from the head into the gums which causeth the pain: therefore be sure to keep the head very warm when you have done.

I have been certified (but how true it is I know not) that three teeth taken out of a dead mans skull, and sowed in a clout, or piece of leather, and worn about them, which were much subject to the Tooth-ach, gave them present ease, and they never were troubled with the same so long as they had those about them.

RECEIPT LIII.

A dainty Receipt for curious Artists, or others, to strengthen, and comfort the eyes.

THis Receipt I had of a curious Ingraver, and my Friend who every morning before he went to work in the corner of his Hand-kerchief, (or a clean linnen rag) did put a few drops of Aqua-vitæ, and with the same did wipe the corners of his eyes, eyebrowes, and temples, which did keep back the Rheum, and greatly did strengthen and comfort the eyes; of which I have often made triall and found much comfort.

RE-

RECEIPT LIV.

A precious Salve for all those that have had any member out of joint, called Jeremy of Brunswick's Salve.

THis famous Chirurgeon, with this Salve, hath healed those that had formerly their members out of joynt, or those that had been wounded and could not stir or bow the member where they had the hurt; for by this Salve did he bring many stiffe and crooked joynts again to their former strength, to the great admiration of all men, both Chirurgeons and others.

How to make the Salve.

Take two ounces of old Hogs-grease, and of Ducks-grease, and Goose-grease, Hens or Capons-greate, of each two ounces; Linseed-meal, Fenugreekmeal, of each two ounces, Oyl-olive eight ounces; Opopanax, Mastick, and Frankincense, of each an ounce: dissolve the Gums in white wine that are to be dissolved, and powder the other, mingle them all together, and add wax and turpentine to them, then boyl them all together with good stirring.

RECEIPT LV.

An excellent Unguent, or Liniment for green Wounds, especially for those in the head.

TAke of the best Turpentine an ounce and a half, and as much of Gum Elemi, or Capons-grease an ounce, melt these at the fire, and mingle them. When you use it, melt it, and anoynt the edges of the wound, and dip a pledge of lint in it, and then lay a plaister on the top of the same, and roll it gently.

RE

RECEIPT LVI.

How to make a soveraign Oyl, or balm for all wounds simple or confused.

TAke three pound of common Oyl, two pound of Turpentine, wheat that is cleansed five ounces, Saint *Johns* wort a pound, Valerian, Carduus Benedictus, of each fourteen ounces; bruise the Herbs, and infuse them in white-wine six or eight hours, then put thereto the Wheat and Oyl, and boyl them on an easie fire, till the wine be consumed: then strain them, and put the Turpentine in, and then boyl them again on a soft fire to perfection.

RECEIPT LVII.

An excellent Emplaster, which is good for all wounds or Ulcers.

TAke Deers suet four ounces, Rosin, and Perrosin, of each a pound and a half, white wax, and Frankincense, of each four ounces, Mastick an ounce; melt the wax and suet, and powder the gums, and put them together, and when they be melted, strain them through a piece of Canvase, then add to them a pottle of white-wine, and boyl them all to the composition of the wine, with continual stirring, and then take it from the fire, and when it is almost cold, put thereto four ounces of turpentine washed in white wine, and of camphire powder'd two ounces; then make roules of it, and keep it for your use.

ERCEIPT LVIII.

Another excellent Plaister for wounds in the Breasts, or other parts.

TAke Rosin that is fresh, clear and sweet, a pound, Oyl of Bayes, and turpentine, of each two ounces; Gum Elemi

Elemi sweet and good four ounces; melt the Rosin and Gum together, and stir them well; then put in the Oyl and turpentine, and let it boyl, with continual stirring, and then strain it, and reserve it for your use in a close pot.

When you use it spread it on a piece of leather, bigger than the wound by three fingers breadth, and make a hole in the middle of the leather for the corruption to run forth, this doth it without tent or pledget, dress it twice a day in the Summer, and once a day in the winter.

This plaister is good for all wounds in the breast, or other parts, for it draweth the hollow parts of all wounds, and strengthens the parts, clearing them from unnatural matter, and dryeth all wounds caused by thrusts.

RECEIPT LIX.

Of the general significations of sicknesses, either present or near at hand.

THese following presages and tokens of sicknesses are worth the observation of all men; First, to prepare themselves for God, if he be pleased to call them; otherwise that they may in time, before they be too much spent, have the counsel and help of learned and expert Physicians.

Signs of Sickness are these.

If the body be hotter, colder, moister, dryer, leaner, fatter, or the colour more pale, or more swarthish, or the eyes more hollow than they were accustomed to be, and on the sudden change, all these are certain fore-runners and messengers, that the body is disposed to sickness, or already sick.

RECEIPT LXI.

Of the signification of the several colours of some Urines.

THe colours and Symptoms of Urines are many and various, as are the Diseases, and therefore ought

be judged on by the learned: but thus much in brief.

Red and thick urine, betokeneth sanguine.

Red and thin, betokeneth melancholy.

White and thick, signifieth flegm.

White and thin, betokeneth melancholy.

The highness of the colour signifieth heat, but the pale, black, or green, betokeneth cold.

Also, the grosness, or thickness of the urine signifieth moisture, the clearness, or thinness, dryness.

Urine of the colour of bright Gold, or of the colour of Gilt, signifieth perfect digestion, or health.

Red as a red Apple, or Cherry, or base red like bole Armoniack, or red like glowing fire betokeneth excess of digestion.

Clear and white like water, or gray as a horn, or white like whey, or the colour of a Camels hair, signifieth lack of digestion.

Pale, like to broth, or flesh sodden, betokeneth the beginning of digestion.

Citrine colour, or yellow, sub-citrine, or paler, signifieth the middle of digestion.

Colour of a Beasts liver, or of dark wine, or green like to Cole-worts, sheweth adustion of humours.

Urine of a leady colour, or black as Ink, or black as horn, or dark above, and clear beneath, betokeneth feebleness of nature, mortification, and death.

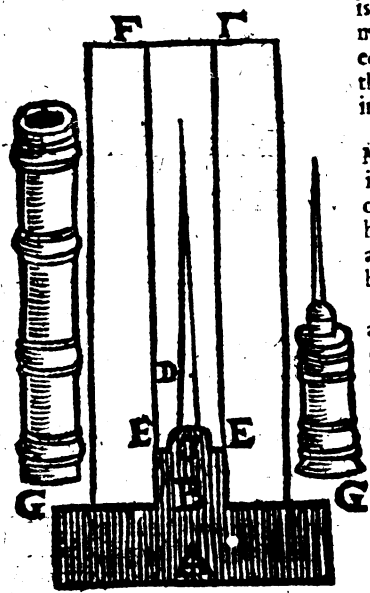
The

The School of Artificial Fire-Works.

FIRST.

The order and making in a true proportion all sorts of Moulds for Fire-works.

BEfore you proceed to the making of Rockets for Fire-works, it is requisite to understand how to order, and make your Moulds and other instruments for the same, and first for your moulds you must provide a piece of good dry Box, Holly, Walnut-tree, Crab-tree, or some such like tough wood, without shakes or knots, and when you have thus done, it is fit to know of what length and breadth you desire to have your Mould, for following this kind of proportion, all other sorts of moulds are made great and small, therefore you ought to have a Turner to turn and bore the same: as for example: I would have the hole of a Mould bored but an inch diameter, or wide, then the length of the Mould must be six times so long as the hole is wide (which is six inches) and on each side of the hole half an inch thick: So that when the Mould is turned round, it is two inches over in breadth. When you have done this, you must have a bottom made, that



is to be fitted in this manner, as is described by the letters in the Figure following.

A. Is the foot of the Mould, and must be in height two inches, must be in breadth an inch and a quarter, whether it be square or round.

B. Serveth only for a stay, and must rise one inch into the Mould, and so proportionable in all other Moulds.

C. Is for the mouth of the Rocket, and is in breadth two third parts of an inch, and then setting one foot of a pair of Compasses in the middle or center, describe the arch, which is the full height required.

D. Is the length and bigness of the Needle, which is two third parts, the length of the Mould and the bigness of the bottom one sixth part, the breadth of the bore, and taper toward the top.

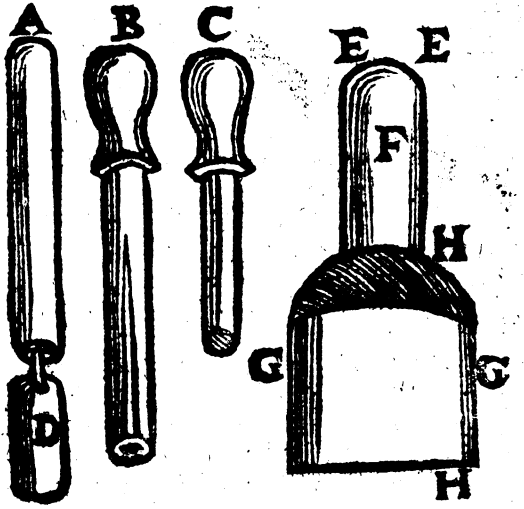
F. E. Serveth for the Paper being rouled, and must be one sixth part of the breadth on each side.

F. F. Is the thickness of the Mould, which is half the breadth of the bore, that is in this Mould half an inch.

F. G. Is the length of the Mould, which is six times the breadth.

2. *The order and making of Rowlers, Rammers, and other things for the Coffins.*

HAving provided your Mould, then you are to fit your Rowler, which muſt be two third parts of the breadth of the bore of the Mould, and the length thereof ſix inches longer than the Mould, which is for rouling of your paper, and is deſcribed by the letter A in the figure



following, with a hole to be bored in the bottom to receive a Wyre, which muſt be faſtned in another piece of wood ſomewhat ſhorter, to take out at your pleaſure, which is deſcribed by the letter D, the uſe thereof ſhall be deſcribed, when I ſhall ſhew the order of making the Coffins.

When you have fitted your Rocket, then proceed to the mak-

making of your rammers, which must always be two at the least, for each several Mould as they increase in largeness, so you must be fitted with several rammers, by reason of the Taper Needle. the manner and form is described by the letters B, C, in the figure following.

B. Is the hollow rammer, and hath a hole in it answerable to the length and bigness of the Taper Needle, it must be a small matter less than the rowler, because that otherwise in putting it in, you will put down the paper. The other rammer is not half so long, and flat, that when you have beaten to the top of the Needle, you may make use of this, which is marked with the letter C.

Having fitted your rammers. provide a piece of Box made after the form as you see described by the letter E. which must serve to make your large Coffins, to put the whole work which you intend, on the head of your rocket.

E E. Sheweth the breadth, which is the just bigness of the Rocket, and must be so in all sizes.

G G. describeth the largeness of the Coffin, and must be twice the breadth of the Rocket.

The Letters H, H, sheweth the length of the Coffin which ought to be twice the breadth of the rocket, but you are not tyed to that so precisely, because you may alter that according to the work which you put therein.

3. *How to order, and make the Coffins of paper.*

HAving explained the manner and form of the mould, with the other things belonging to the same I will now shew the use of them in their several orders: and first for the use of the Rowler described by the letter A. in the Figure before.

Provide you some good large strong Paper for your work: and to know what length your Paper must be, let it be always the length of your mold, so shall you have one breadth left above the mould, the use whereof shall be shewed hereafter. Now having provided your Paper in length ready, take your rowler and one length of Paper, and begin to roul; when you have rouled one sheet, you must have a board with a handle, to roul it with, (the board is marked

in

in the figure following with the letter B.) which must be done in this manner: you must hold the rouler in your left hand, and with your right hand hold the board by the handle, and then lay down your rowler upon some smooth chest, or table, which when you have done, roul another length of Paper, and so proceed in rouling between every sheet, until you have rouled on so much, as will fill the mould very streight. When you have thus done, draw forth the rouler about an inch, and then take the other short rouler, which is marked with the letter D. in the other Figure, and put it in as you see described, and there you shall have a place left for the choaking of the Rocket, of which is next so lowing.

4. The order and manner how you shall choak a Rocket.

WHen you are to choak a Rocket, you must have an Iron hook, or a staple driven into some post, to which you must fasten your cord; which must be bigger or less, according to the bigness of your Rocket, by reason that a small cord will not choak a great Rocket for want of strength, and a great cord will not serve for a small one, in regard that it will make too great a choaking, so that you must have a bigger & a less; & when you have so done, you must tye one end of

the cord to the hook or ſtaple, and at the other end, about a yard off, tye a ſtrong ſtick, in faſhion of a ſwing, it muſt be ſtrong, becauſe it beareth the weight of the body, (as you may ſee in the Figure following, marked with the letter K) which when you have provided, put the ſtick between your leggs, and wind the cord about the Rocket-caſe in the place appointed, which muſt be between the long rowler and the ſhort: when that is done, girt it by degrees, ever turning the rowler, to the end it may come together more cloſe and near, and when you have ſufficiently choaked it, draw forth your ſhort rowler, and where the choaking is, tye it about with ſtrong Pack-thread, and then draw forth the rowler, your Coffin is ready to be filled when occaſion ſerveth, the form whereof followeth, by this letter A.

5. *The manner of driving a Rocket, with the Inſtruments belonging thereto.*

YOur Coffin of Paper being finiſhed, take it, and with your hollow Rammer, force the ſame down cloſe into the mould, and when you have done, ſtrike two or three hard blows, to ſettle the Paper into his right form: Which being done, then you muſt fill the Coffin, in doing whereof you muſt

muſt have a care, providing a meaſure which may contain but the twentieth part of your whole Rocket; ſo by that means you ſhall not fail, but every Rocket ſhall have a true proportion alike: as for example, I have a Coffin, which being filled, will hold an ounce of mixture, or thereabout: then I take the twentieth part, and when I find what quantity it is, I make a meaſure of horn or Latten marked with the Letter F. which ſhall contain ſo much, and then I begin to fill my Coffin with one meaſure at a time, & putting in my Rammer, I ſtrike four or five ſmart blows with a good heavy mallet, and then fill another meaſure, and ſtrike again, ſo I continue till I come to the top of the needle, then I take the ſaid Rammer, and ſo continue with it, till I come to the top of the mould: now the paper which is above the top of the mould muſt be turned down and beaten hard: which being done, the rocket is finiſhed from the mould, which being forced out with as much eaſe as you can, for the leſs you force it, (being filled, and the Needle taken out,) the better it is, for knocking looſens the Powder, and ſo cauſes the Rocket for to fail. You ſhould have a Funnel to fill your ſmall Rockets, which is marked with the letter G.

6 Of the Compoſition and Receipts for your Rockets.

HAving thus finiſhed your Rockets, it now reſts to know the Receipts: For in the making of them, the chiefeſt thing to be regarded is the compoſition that they ought to be filled withall: forasmuch as that which is proper to Rockets which are of leſs ſort, is very improper to thoſe which are of a greater ſize: for the Fire being lighted in a great Concave, which is filled with a quick compoſition, burns with great violence: and ſo contrary, a weak compoſition, being placed into a ſmall Concave, maketh no effect: Therefore we ſhall here deliver Rules and directions, which may ſerve for the true compoſition, or matter wherewith you may charge any Rocket; from Rockets which are charged but with one ounce of powder, unto greater, which require for their charge ten pound of powder: and here follow the ingredienees for ſeveral rockets.

First, for Rockets of one ounce.

Unto each pound of good musket powder beaten, put two ounces of ſmall-coal duſt, and with this charge the Rocket.

For Rockets of two or three ounces.

Unto every four ounces and a half of powder-duſt add an ounce of Salt-perer, or to every four ounces of powder-duſt add an ounce of Coal-duſt.

For Rockets of four ounces.

Unto every pound of Powder-duſt add four ounces of Salt peter, and an ounce of Coal-duſt, but to have it more ſlow, unto every ten ounces of good powder-duſt, add three ounces of Salt-peter, and three ounces of Coal-duſt.

For Rockets of five or ſix ounces.

Unto every pound of Powder-duſt, add three ounces and a half of Salt-peter, and two ounces and a half of coal-duſt, and an ounce of Sulphur, and an ounce of File-duſt.

For Rockets of ſeven or eight ounces.

Unto every pound of Powder-duſt, add four ounces Salt-peter, and three ounces of Sulphur.

Fo

For Rockets of ten or twelve ounces.

Unto the former Ingredients, add half an ounce of Sulphur, and it will be sufficient.

For Rockets of fourteen, and sixteen ounces.

Unto every pound of powder-dust, add four ounces of Salt-peter, of Coal-dust two ounces and a quarter, of Sulphur and File-dust an ounce and a quarter.

For Rockets of one pound.

Unto every pound of Powder-dust, add three ounces of Coal-dust, and an ounce of Sulphur.

For Rockets of two pound.

Unto every pound of Powder-dust, add nine ounces and a half of Salt-peter, of Coal-dust two ounces and a half, of File dust one ounce and a half, and of Sulphur three quarters of an ounce.

S C B

For Rockets of three pound. 4 1 1/2 1

Unto every pound of Salt-peter, add six ounces of Coal-dust, and of Sulphur four ounces.

For Rockets of four, five, six or seven pound.

Unto every pound of Salt-peter, add five ounces and a half of Coal-dust, and of Sulphur two ounces and a half.

Here note that in all great Rockets there is no powder put, because of the greatness of the Fire, which is lighted at once, which causeth too great a violence, and therefore ought to be filled with a more weak composition.

Now when you have provided your Powder, you must first meal it, and then searce it, so that it may be free from any corn, though never so small. Likewise take good dry coal, well burnt, and beat it to dust: searcing it very fine, which when you have done, mix them according as your occasion requireth, and follow your directions.

7. *The manner of heading a Rocket, with the order of capping it.*

IN the manner of heading a Rocket, you must use the thick Rowler, which you may see described by the letter F in the second figure: upon which you must rowl some paper or fine Paste-board, and paste it so that it may be very

close, and then chouk it at the length of the thicker part, so that it may come close to your stick in the lesser part, which will be fit to be tyed to the top of the Rocket: so shall you have a Coffin to put in your works, which must be of divers sorts. This being done you must provide taper-Caps, which must be joyned to the top of the large Coffin. The use of them is to keep in your works, and to cause them to pierce the Air more swiftly. The manner of making these Caps, is to take a pair of Compasses, and describe a circle in a Past-board; then cut it out with a pair of Sheers, and that will make two caps, being cut in the middle, and turned one corner under the other, and so pasted: and let them so pasted, be put in a Napkin-press till they be dry, and when they be dry, cut out a half circle in Paper, which shall sit round about the said cap, and shall serve to paste on the cap to the coffin; So you have all things ready to the finishing of your Rocket, which must be done in the manner which followeth. R. in the next figure, is the crackers fastned to the top of the Rocket, S. is the cap. T. is the Fisgigs finished, H. is the stick tyed to the Rockets.

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8. *The manner of fastning a Rocket.*

HAving driven your Rocket, as I have shewed, with the Paper turned down, you must first prime it, which must be with cotten wick made for that purpose, which you must put into the vent, leaving a piece to hang lower then the mouth of the Rocket by three or four inches; which being done, tye a piece of Paper over the mouth, that it may not fall out. Now having primed your Rocket, you may proceed to the heading of it, and that is done after this manner.

Take your Rocket, and on the head you should turn down the Paper, you must with a Bodkin pierce two or three holes, that when the Rocket hath spent it self, the works which are in the head may take fire; which holes prime with a little Powder-dust, and then put on the head, with the chouking fitted to your Rocket, which must come over the

the ſame in ſuch manner, that the bottom of the greateſt part muſt come even with the top of the Rocket; which tye faſt to the Rocket with thred, and then put in your works; but before you put in your works, whether they be Stars, or any other works, you muſt put in a little cotten-wool being rouled in Powder-duſt, to make your Stars to take fire, or likewiſe may blow out: Having thus done, put in your Stars, or other works, and if you make more than one tire, (as you may do of your Stars) then you muſt put more Cotten rouled in powder duſt among them, or between every tire, that they may all take fire; then take your Cap, and fill the hollow place with Cotten, becauſe it is light, and likewiſe will fire quickly; which being fitted, paſte it cloſe to the top of the coffin, that it may ſtand upright; then muſt you fit your ſtick, for the poyſing of your Rocket, which ought to be eight times the length of the Rocket without the head; You muſt get the ſmoothеſt and lighteſt you can, ſuch as Basket-makers uſe, and then cut one ſide of it flat at the great end, then make two notches on the round ſide, that the one be differing from the other, ſo much as is between the choaking of your Rocket, and the end of the Vent, for if you ſhould tye it upon the Vent it would looſen the Powder, cauſing it to break in the Firing; be careful that you tye not the wrong end of the Rocket upper-moſt, but tye that end downward that is choaked, and with a piece of thread that is ſtrong, tye it to the lower notch about the choaking. When you have tyed that, then tye the other higher, and let the ſtick come even with the top of the Rocket, the manner whereof is ſhewed in the next figure, by the letter G. Then poyſe your Rocket, by laying it on your finger two or three Inches from the mouth; and if you find the ſtick be too heavy, cut it ſhorter, till you find your rocket to ballance your ſtick; for if the ſtick be too heavy, the rocket will be a ſlug, and being too light, the rocket will fall before it be half up. Theſe things being provided, you have your rocket ready to be fired, which muſt be after this manner following.

9. The manner of firing Rockets, with the description of a Staffe for the same.

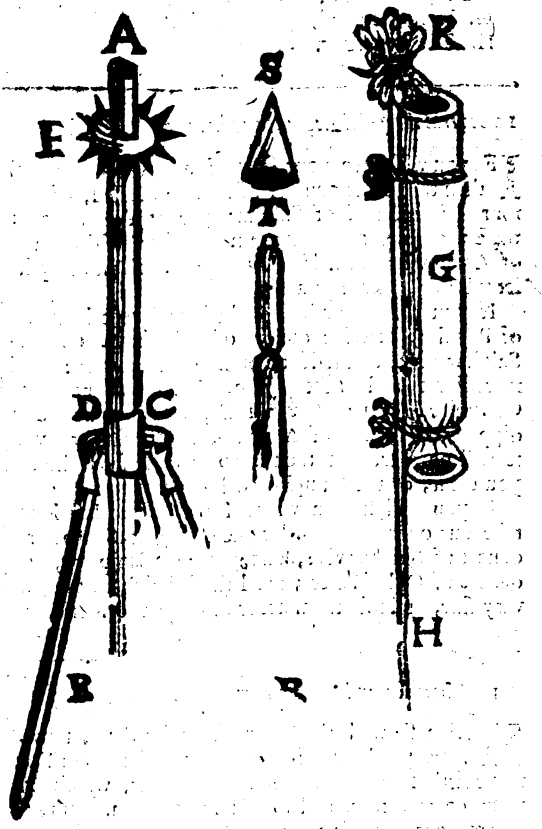
YOu must provide a long staff, with a Pike at one end, to be thrust hard into the ground, with a three legged staff, having a hollow hoop at the top, to let this long staffe slide up and down, to the end that having Rockets whose sticks are longer than the staffe, yet by raising it through the said Iron hoop, you may make it four or five foot longer than it would be, standing on the ground. Now this long staffe must have a sliding place cut with several points, which must be near the top; and at the bottom there must be a ring of Wyre, to let the stick go through; which must be made likewise to slide up and down, so thrusting the small end through the said Ring, your rocket will rest upon that part above, which must be just opposite in a streight line; so open the mouth of your Rocket and pull out the end of your Cotten-wick, and with a piece of Match fastened in a Linstock, give fire to the wick, and by degrees you shall see it fire your Rocket; which ordered well, will mount very streight and high. Thus having shewed the whole order of composing a rocket, with firing of the same, I will in the next place shew you the order for making of stars, and other works, which are necessary for the heads of your rockets. The Figure of the rockets, and the staffe are here presented.

The Letter G. is the rocket with the long stick.

A. The long Staffe to rise through the ring.

B. B. B. The three legged Staff.

C. The Ring or Hoop of Iron, for the long staff to slide through.



D. The Screw to faſten to the long ſtaff being raiſed.
E. A piece of Iron filed with notches to hang the Rocket on.

F.

F. The Ring of Wire to put through the ſtick, to be raiſed higher or lower.

G. Is the Rocket.

H. The long ſtick.

---

10 *Several compoſitions for the ordering of Stars of ſeveral colours.*

IF you will have your ſtars of a blew colour with red, then take eight ounces, of Powder mealed, of Salt-peter four ounces, and of Sulphur vive twelve ounces: Meal theſe very fine, and mix them together with two ounces of Aqua vitæ and half an ounce of the Oyl of Spike, and let it be dry before you uſe it.

If you will have a beautiful white Fire, take four ounces of Powder, twelve ounces of Salt-peter, ſix ounces of Sulphur vive, and half an ounce of Camphire: meal your ingredients and mix them. Now to powder your Camphire, you muſt uſe a Braſs morter and a peſtle, dipping it in Oyl of Almonds, ſo ſtirring it by degrees it will powder, and then keep it cloſe from the Ayre till you uſe it, or the Camphire will loſe its ſpirit.

If you will have a white Fire, and to laſt long, then take four ounces of Powder one ounce of Salt-peter, eight ounces of Sulphur vive, one ounce of Camphire, and two ounces of Oyl of Peter; meal thoſe which are to be mealed very fine, and mix them according to the former directions.

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11. *The order and manner of making the beſt ſort of Stars.*

HAving ſhewed the Compoſition for Stars, now I will ſhew you how to make them, which is thus: You muſt make little ſquare pieces of brown paper, which fill with your compoſition, and ſo double it down, rouling it till you make it ſomewhat round about the bigneſs of a Nut or bigger, according to the ſize of the Rocket, you may put in a dozen on the head of a ſmall Rocket, binding them round with a thread, and then draw a cotten wick through them, being prepared for priming.

Alſo

Also there is another way which is thus; take a small Rowler, about the bigness of an arrow, and roul a length of paper about it, and paste it round, letting it dry, and then you have a hollow trunk of this paper, fill this with your ingredients, thrusting it hard till it be at the top, and then cut it into short pieces, about half an inch long, and then in warm glew dip one of the ends therein, and let them drie, to the end that both ends of your Stars fire not, and then put the other end into Powder-dust; you may put them on your Rocket, in one or two tires, putting in Powder-dust between every tire, that they may all take fire.

The priming is thus made; Take Oyl of Camphire soaking cotten wick therein, and being moyst roul it in fine Powder-dust, and then hang it up till it be thorow dry, and then keep it close from ayre till you use it, or the spirit of the Camphire will decay.

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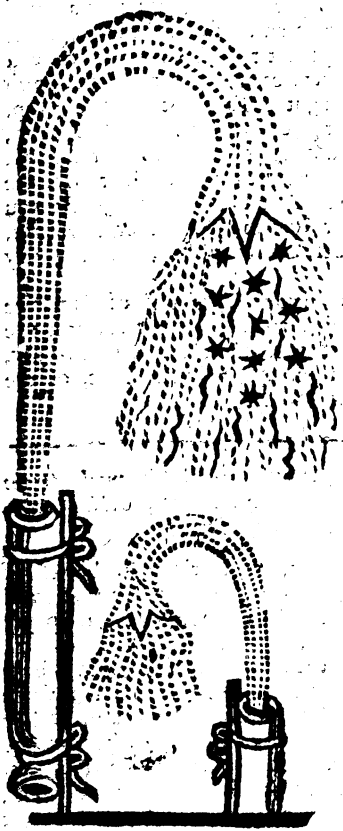
12. *The order and making of other several Fire-works for the Rocket, as Serpents, or Fisgigs, Reports, Golden and Silver Rain, &c.*

THe Serpents or Fisgigs are made about the bigness of ones little finger, by rowling a paper upon a small rowler, (as it was for your Stars) and choaking the paper Coffin an inch from the end, then fill it three inches with Powder-dust, and then choak it, and then put in a little corn powder, when your serpent have played a while to and fro, it may break and give report: you may fill it with the Star mixture, and puting divers of them on the head of the large Rocket, they will first appear like Stars, and when the Stars are spent, take hold of the powder-dust, and they will run rigling to and fro like serpents, and at last will give so many reports, very delightful to behold.

The reports are made in their proper cases, as the Serpents are, but the paper must be somewhat thicker, which will cause it to give the greater report: These are to be filled with grane powder, or half powder and Star mixture.



To make the golden Rain, you must get store of Goose-quills, and cut them off next the feathers, and fill these quills hard with the same composition that is in your Rocket, and must be put on the head of the Rocket with the open end downwards. If it were possible to put a thousand of these quills upon the head of a Rocket, it were a dainty sight to see how pleasantly they spread themselves in the air, and come down like streams of gold much like the falling down of Snow, especially if the wind be any thing high.

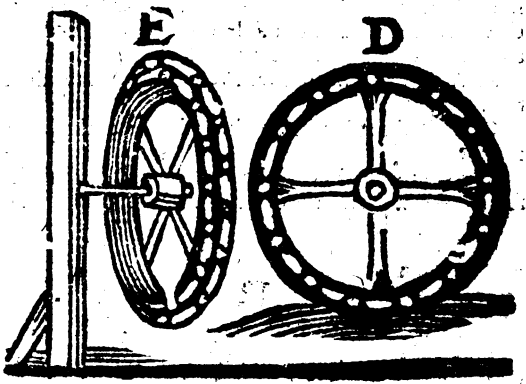
If you will make silver Rain, it is performed as the other, only you must fill your quills with the same ingredients that you did your white Stars.

13 *How to make your fire-works to run upon a line backward and forward.*

TAke small Rockets, and place the tail of one to the head of the other, tying a Cane to them to run on a line

soped;

ſoped; the line may be a hundred yards long, or longer if you pleaſe, being well ſtretched and ſet on ſtakes, as you may ſee in the figure following; as admit the line to be ABCDEFG. and if you give fire to the Rocket at A, it will fly to B, and then come back again to A. Then fire another to C and that will fly to D, and back again to C, and ſo of



the reſt: And at the laſt (if you pleaſe) may be placed a pot of Fire-works, which being fired will make good ſport, having Serpents and other things in it, which will variouſly intermix themſelves in the air, and upon the ground, and every one will extinguiſh it ſelf with the report.

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14. *How to make a Wheel of Fire-works to run forward and backward upon the ground.*

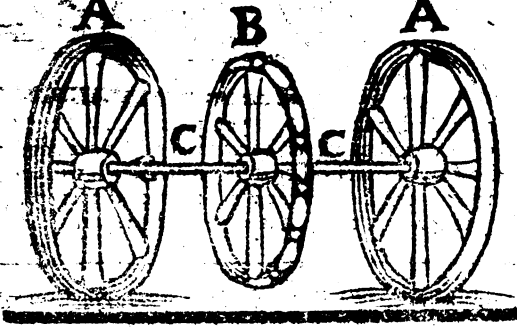
YOu muſt get a pair of light Wheels like ſpinning Wheels, both of a bigneſs, which muſt be faſtned to a ſmall light axle-tree, in ſuch manner, that they may not move about the ſame, and on the middle of the axle-tree, faſten alſo a Fire-wheel (as you may ſee in the Figure following) which muſt not be ſo big in compaſs as the two other Wheels, becauſe it muſt not touch the ground, ſo

that being fast in the middle upon the same axle-tree, it cannot run unless it carry the other Wheels with it; these being set on an even ground, will run a great way without ceasing: now that you may make it return back again when it hath run its course forward, you may make your middle Wheel in such manner, that it may have Rockets on both sides, so that when one side is spent, it may give fire to the other side, the mouths of the Rockets being fastned the contrary way will make a return with a swift motion.

A. A. Are the two outward Wheels fastned to the axle-tree.

C. C. Is the axle-tree on which the three wheels are all fastned,

B. Is the Fire-wheel in the middle, and carrieth it not so great a compass as the other two wheels.



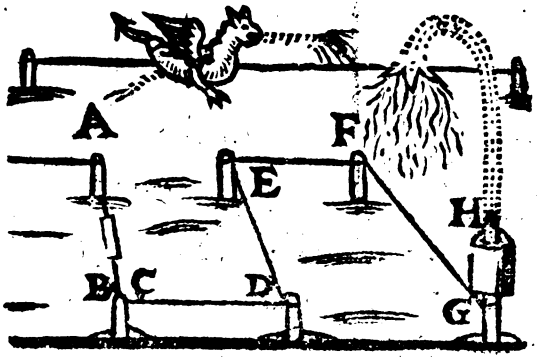
15 *Another way for a single wheel to be placed on a post to turn both ways.*

THis may be performed with a single wheel, so that the Rockets may be placed on each side (as in the other middle wheel) with a hole from the one side to the other for a vent; then place your Rockets first upon one side (but so that

that the laſt Rocket be placed over the ſaid hole) and boring a ſmall hole in one ſide of the laſt Rocket, put in a cotten wick for priming, letting it come through the hole in the Wheel, to the mouth of another Rocket which ſhall be turned the contrary way on the other ſide: ſo that the Wheel having finiſhed its revolution one way may take fire on the other ſide, making a retrograde motion: but if you place the Rockets all one way on both ſides, it will continue twice ſo long as another of the ſame bigneſs, the form of which is expreſſed in the Figures following.

D, Is the wheel with Rockets on one ſide, the laſt Rocket to have a vent to paſs through to the other ſide.

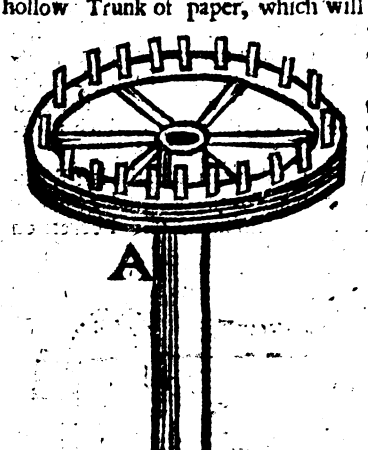
E. Repreſents the ſaid wheel finiſhed, with Rockets on both ſides.



16. *The order to make a fixed wheel, ſtanding upon a Poſt, giving divers reports.*

THere muſt be a wheel turned two foot wide, and out of the upper ſide muſt be a groof turned half an inch wide and half an inch deep, to which groof you muſt have a piece of wood ſo fitted, that it may juſt ſlide in, which piece of wood muſt have ſo many ſmall holes bored in it as you will

have reports about it, and be sure you set them not too near together, lest the fire of one beat the other down; having thus provided your wheel, you must make a convenient hollow Trunk of paper, which will just fill it, and fill the same with some of your slow mixtures of stars, and then putting on the cap of wood so fitted with holes, being made fast with glew, pierce every hole into your hollow conveyance: so that putting a quill into every one, they may take fire, and to the quill fasten a Report; so shall you have a peal of Chambers placed in a small room, which being once fired, will follow in order, till the whole train be spent. Behold the Figure marked with A.



17. *Another fixed Wheel upon a post, which will cast forth many Rockets into the Air.*

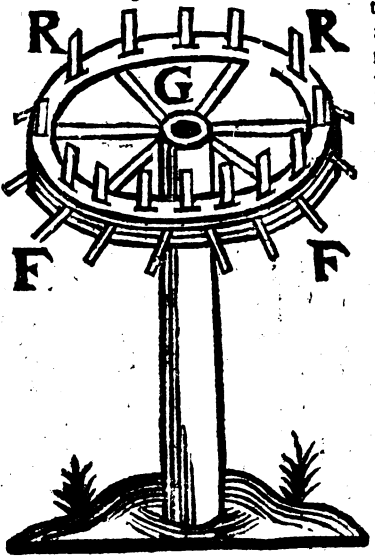
This Wheel is not much unlike the former, which will give Fire to divers Rockets standing circular, differing little from the former, only you must make a hole for every stick to pass thorow, as it is in the Figure B. and therefore it must be made somewhat broader, which will work the like effect that the other doth, by conveying Fire from one Rocket to another, till they be all spent.

The mixture for this conveyance must be very slow, therefore

therefore uſe theſe Ingredients: Take eight ounces of Roch peter, four ounces of Sulphur vive, half an ounce of Camphire, two ounces of fine Powder-duſt, and meal theſe very fine, and mingle them together, adding half a quarter of an ounce of Linſeed Oyl, and as much of the Oyl of Peter, theſe Oyles muſt be dropped in by degrees, and ſo wrought up, till you find your mixture bound like Dough, and this is both ſlow and ſure.

18. *Another dainty fixed Wheel, which will caſt forty divers Fiſgigs, or Serpents, and as many Reports.*

YOu muſt have a Wheel turned with a groof on the top thereof to put in the conveyance of paper, then fit on a piece of wood (as it was before ſhewed) with ſmall holes to put in quils, which are for Firing your reports, and muſt be placed round about the upper part of your wheel, and on the ſide thereof divers holes muſt be made of the bigneſs of your Fiſgigs, which muſt be pierced through to the paper conveyance, thoſe Fiſgigs that are placed round on the ſides and the reports on the top, one train will Fire them all; and in firing you ſhall ſee all the Fiſgigs flying round about, one after another, as the fire paſſeth to them; and for every Fiſgig which paſſeth out ſhall be fired a report; ſo that there ſhall be a continual motion, until the whole train be conſumed.



G. Is the Wheel with reports and Fiſgigs.
RR. Is the Reports on the upper part.
FF. Is the Fiſgigs on the ſide of the wheel.

19. Another dainty one with Fisgigs, called Jack in a Box.

THe manner of making the same is in this order, cause a box of plate to be made about six inches deep, and of what compass you please (with a socket at the bottom to put in a staffe) then putting in a quantity of corn-powder, or powder-dust in the bottom of the box, you may fill it with Fisgigs or Serpents, leaving a place in the middle for a Cane to go through the bottom, which Cane must be filled with a slow recepit in which you must put a quantity of Camphire, but no Oyls, in regard of the narrow passage it hath to burn, without any other vent; then put your Cane down, leaving it an inch above the box, and take a thick piece of pastboard, cutting a hole for the Cane to pass through, and glew it close to the Cane, that the Fire pass not through before its time: this past-board must be of sufficient breadth to cover the box quite over, then put it on a staffe and light your Cane, which will appear only like a Candle, and after a little space of time you shall hear a sudden noise, and see all those Fisgigs flying, some one way, and some another: This hath given good content to the beholders, you may if you please make Clubs or Maces of the same.

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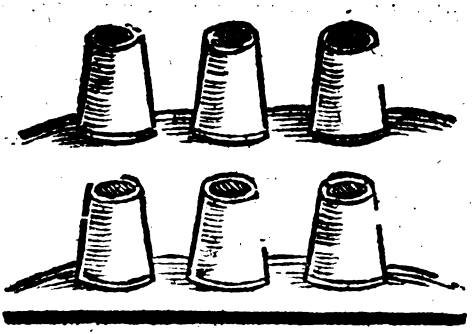
20. Of Pots of Fire for the ground, which will make the Air rebound with their reports.

MAny Pots being fired together, do give a fine representation and recreation to the spectators; for those pots being filled with balls of fire, or flying Serpents for the Air, will so intermix one within another in flying here and there a little above the ground, and giving such a volly of reports, that the air will rebound with the noise, and the whole place be filled with sundry streams of pleasant fire, which Serpents will much trouble those near the place to defend themselves in their upper parts, and they will be no less busied by the balls of fire which will seem to annoy their feet.



21. *The making of a Fire-ball for the ground, which will be in continual motion.*

YOu muſt get a ball turned of ſome light wood, and then let it be ſawn through the midſt with a thin bow-ſaw, then make on each ſide a hollow groof to lay in two Rockets (joyned together after the manner of the Runners) and then cloſe up your ball with glew; only in the place where the two Rockets joyn, ſhall be a groof, which muſt be paſted over with paper, that the ſecond Rocket taking fire may have a vent, otherwiſe the ball will ſerve but once, then fire it, and you ſhall ſee the operation with pleaſure.

22. *The making of a Ball for water, which ſhall burn with great violence.*

SOw a round Caſe of ſtrong Canvas, in ſhape of the caſe for a Foot-ball, but ſomewhat leſſer, and very round; having thus made your caſe, then proceed to the filling of it, which muſt be done in this manner: You muſt firſt put in three or four good ſpoonfulls of your mixture following, and with a ſtick made round at one end, force

it

it close together, and so continue filling it, and between every filling put in your stick, and force it together, round it continually in your hand till you have finished it; which having done, sow it up close, and then arm it with small cord, which is called marling; after you have thus done, you must coat it with a quantity of Rosin, Pitch and Tallow to dissolve, and dip your ball all over in the same, provided that you leave two vents to fire it, which must be pierced a third part into your ball, which must be stopped with two small sticks, till such time as you come to use them, the form thereof you shall see in the next figure by the Letter D, then pulling forth the sticks, fill the two vents with fine powder-dust, and firing it, cast it into the water, and you shall have your desire; but you must always be sure that your ball be throughly fired before you cast it from you: The Receipt for this ball followeth.

Take one pound of Powder, eight ounces of Roch-water, four ounces of Sulphur, two ounces of Camphire, one ounce of oyl of Peter, one ounce of Linseed Oyl, half an ounce of Oyl of Spike, and two ounces of Colophonia.

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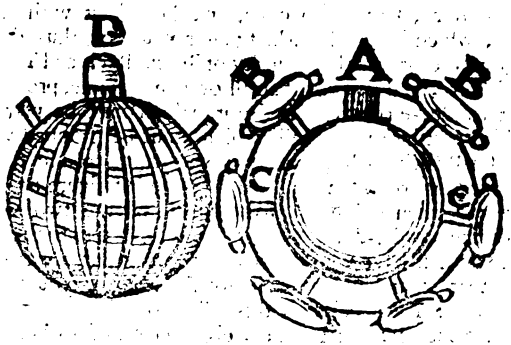
23. *Another dainty Waterball, which will shoot forth many Reports.*

THis Ball must be made of wood (as was shewed before) in two pieces, because you may joyn it close together at pleasure, having small holes bored round about it, to put in your quills which justifie the Reports, which reports or breakers must be made of paper, choaked at both ends and primed through the midst; they must be fastened round with pitch, and so covered round about, that no water may pass in: you must fill this ball in two halfs, that you may force it very close together, and when it's filled, glew it fast, and arm it well with nealed wyer, then put in your breakers, with a quill which must enter into the ball, and likewise into the breaker; the form whereof you may see in the Figure following: For A. is the mouth of the ball where it is to be fired, B. B. are the reports or breakers,

being made of paper, and filled with Corn-powder; C C. are the Quills, which must be filled with powder-dust and serveth for firing the Reports.

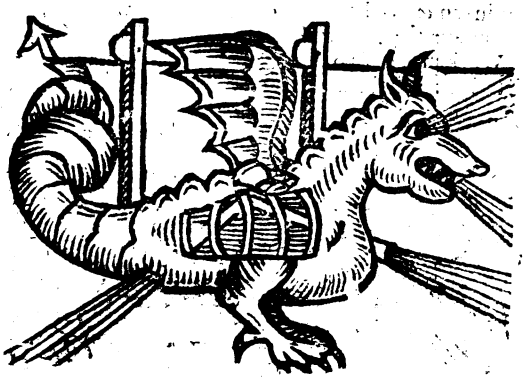


The Receipt for this ball in this; Take one pound of Boch-peter, four ounces of powder-dust, three ounces of Sulphur-vive, two ounces of Camphire, one ounce of Linseed-oyl, two ounces of Rosin, and one ounce of Oyl benedict, you must powder those things which are to be powdered, and mingle them all together, and by little and little sprinkle your Oyls, till you have wrought it like Paste, and then use it: the quills must be filled only with powder-dust, because it must fire suddenly.

24. *How to make a Dragon, or the like, to run on the Line, spitting of fire.*

THe body of the Dragon must be made either with Past-board, or with fine rods of wicker, being hollow, with a place in the belly to put in two Rockets, and must be so ordered, that there may come a small Pipe from the tail of the one, to the head of the other: then make a place for the eyes, and mouth, to put into each hole fire, which must be made up in rouled Paper, and thrust in, then on the

the top of the back, let there be fastned two small Pullies for a Line to run in, which being done, your Dragon is finished for firing, which must be thus: first set it at the eyes and mouth, (always observing that this receipt must be some slow mixture, such as your stars) then fire that Rocket which is placed with his mouth towards the tail of the Dragon, which will make it seem to cast fire from thence till he come to the end of his motion; and then on a sudden (as a creature wounded with some accident) shall return with fire coming forth of his belly: This being well ordered, will give good content to the beholders of the same. Behold the Figure.



25. *The manner and form to represent Saint* George *fighting with a Dragon in Fire, on the Line.*

WHen you have formed your Figures of Past-board, or Wicker (as aforesaid) you must make a hollow trunk through the body of each Figure, for a great Line to pass through, and likewise for a smaller Line to draw them to and fro from each other, which must be fastned in this manner (as you may see in the Figure following:) At the

breast of the Dragon let one end of one cord be tied, which must pass through the body of the George, and turning it about a Pulley at the other end, fasten it to the back of the George, and at the breast of the George let another cord be tyed, which must pass through the body of the Dragon (or a trunk on the back) and so returning about a Pulley at that end, must be pulled streight and fastned to the tail of the Dragon, so that as you turn that Wheel, the George and Dragon will run furiously at each other: and when you please, you may cause them to make a retreat, and come on again: but by all means forget not to sope your line extraordinary well, and likewise have a care that your work be not too heavy above line, but that they may hang in an equal ballance, otherwise they will turn their heels upward, which will be a great disgrace to the work and Work-man? And thus much to the ingenious I suppose will suffice; behold the Figure.

26. How to make a whale, a Mermaid, or other to play and swim upon the water.

YOu may make Figures of what shape your fancy best pleaseth: the body must be made of light wicker rods, and in the midst of the body let there be placed an axle-tree, having two Wheels coming into the water, yet so as they may not be seen; these Wheels must be made hollow, to contain a quantity of sand or water: the use of it is

to

to keep the body of your Figure upright, and able to ſink it ſo far into the water as is needful, and likewiſe to make it ſwim too more ſteady: note that theſe Wheels muſt be looſe, and the axle-tree faſt: in the midſt of this axle-tree, place three or four great Rockets one by another, with their mouths all one way: yet ſo provided that there may be ſuch a diſtance between each Rocket that there may come a vent from the tail of the firſt to the mouth of the ſecond, and from the ſecond to the third. And to the end that it may continue the longer in motion, you may place divers lights about the body, to make it the more beautiful; every of which lights extinguiſhing ſhall give a report, and ſo conclude. There are divers other fine Works to be performed on the waters, which a judicious Artiſt may invent.

The Letter B. repreſents the Mermaid.
C. are the Wheels on the axle-tree.
D. are the Rockets on the axle-tree.

27. Of

27. Of divers other rare Works, which are to be performed on the water.

THose places which are situated upon Rivers or great Ponds, are proper to make these recreative Fires on; therefore if you desire to make some of consequence, they ought to be built upon Boats, or light timber, which may be framed like Beasts, or Fishes spitting of fire; upon which may be built Castles. Pageants, Turrets, or other conceits as you please. As if you would present a Castle out of which shall issue a Dragon which shall swim through the water, and that Dragon be encountred by a horseman, which is thus performed. Cause a Castle to be framed (as is shewed) on light timber, and let the bottom of the door of the Castle with a ground-plat be two foot under the brim of the water, (the reasons follow) and at a foot high within the Castle let there be a certain line tyed which may pass through the body of the Dragon, and may be fastened near the shoar where must be a float sunk so far under water that the line may not be perceived; then fasten on your Dragon (as was shewed before for the line) but so that the head of this may always be above the line, whereas the other was under, then at the appointed time, there must be one ready within the Castle, to fire those parts of the Dragon which are requisite; which being done (by the help of the pulleys) shall pass it through the water which so soon as it presents it self, *Neptune* on a Sea-horse shall come, and encounter the said Dragon, and at last shall overcome it: Or you may order the work so that which you please shall have the victory; for that which keepeth fire longest, is supposed to have the best, and that which is sooneſt spent, to have the worst.

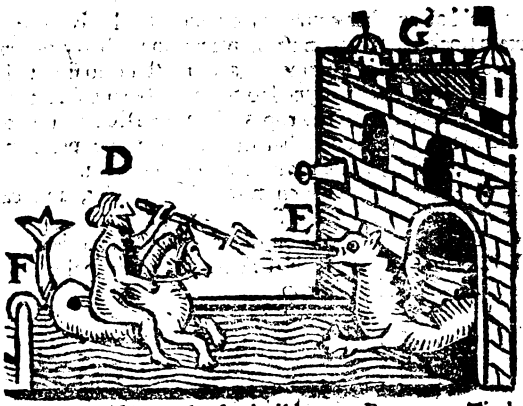
G. representeth the Castle floating on the water, from whence issueth the Dragon.

E. is the Dragon coming forth of the Castle.

D. is *Neptune* riding on the Sea-horse, coming to encounter the Dragon.

F. is the Pully that causeth these motions by the Line be pulled to and fro.

You



You may if you please, build upon Boats, or Timber, Turrets, Pageants, or Castles, as is said, to receive or hold diversity of Fire-works that may be made within them, which may play out, and play divers Fires, as Reports, Stars, Golden Rain, Fisgigs, Granadoes, and Balls of Fire to burn in the water, which will give great content to the eyes of the beholders; and in the conclusion, it may be so ordered, that they may fire one another, for which end they were made.

28. *The manner to compose a Ship of Fire works, which being once fired, divers motions will present themselves.*

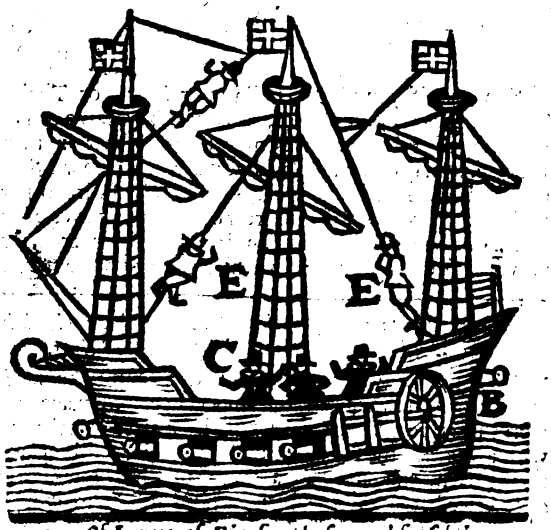
YOu must make a mould or body of a Ship to be made, that you may take off the upper deck, to place some works underneath, where you must have a fire-wheel placed with a screw on the Axle-tree; this Wheel must be placed in the stern, and must turn a rouler, on which must be two girts placed, that must pass on each side of the main mast, and run on to the foreship; in this Wheel there must be a hollow spoke and axle-tree, as I have shewed, which must be so ordered, that the Wheel being spent, it may convey fire to a tire of Guns, lying round about, which must be fired with a close conveyance; and having passed that, it must take

take hold of another conveyance which shall give fire to certain Rockets, which must be placed in the body of some figures representing Mariners, and must be so fitted that they may have a Cane joyned to their body to guide them, that they may run on the ropes from the Deck to the top of the masts. This and other the like may be performed with great facility; the form of which followeth.

B. The Fire-wheel which moveth the Rouler, and carrieth the girt whereon the Figures are placed.

C. The Figures placed on the girt being in motion.

E E. The Figures which stand ready to run up the cords, some half way, some at top.

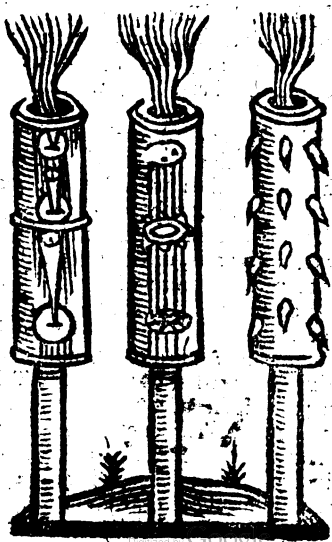


29. *Of Launces of Fire for pleasure and for service.*

STanding Launces are commonly made with hollow wood, to contain sundry Petards or Rockets; these Lances may be fastened to posts, so that they may not be overthrown in the flying out of the Rockets or Petards: but there are a lesser

leſſer ſort of Launces, whoſe caſes are of three or four foldings of paper of a foot long, and about the bigneſs of ones finger: the compoſition wherewith theſe Launces muſt be filled is this: Unto every four ounces of powder you muſt add two ounces of Salt-peter, and unto that add one ounce of Sulphur; and then it will make a brick fire red colour before it be half ſpent, if the Launce be fired and held to it: Now if twenty ſuch Launces were placed about a great rocket, and ſhot to a houſe or ſhip, it would produce a miſchievous effect.

Or, if unto the end of the rocket there were faſtened an arrow (which muſt not be too heavy) and inſtead of the feathers, it ſhould be of thin white tin plate, and if you give fire to it being thus prepared, you may ſee how ſerviceable it will prove. To the head of ſuch rockets may be placed Petards, balls of Fire, Granadoes, and the like, and ſo may be applyed to warlike affairs.



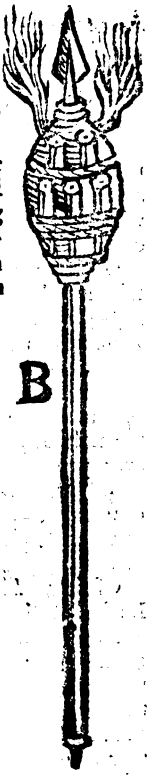
Here follow Neceſſary and ſerviceable Fire-works both for Land and Sea Execution, and firſt for the Pike.

HAving treated of Recreative Fire-works, I hold it convenient to ſpeak ſomething in brief concerning works for Service (neceſſary for theſe times) both for Land and Sea; which may thus be performed.

If you would make good a Breach, or enter a Ship, then take ſtrong Canvas, being cut, ſewed, and tyed hard on a Pike with Marlin-cord, then with this Receipt following, being compounded and wrought together, do thus.

Take Roch water one part, and Peter in meal, as much Sulphur mealed two parts, three parts of Roſin, in roch, Turpentine one part, as much of Linſeed Oyl, one half part of Verdegreaſe, Bole-armoniack, Bay-ſalt, Colophonia, of theſe three one third part, and if you think fitting, half a part of Arſnick: Then coat the ſame over with this liquid mixture melted in a pan or pot? Take four parts of Pitch, one part of Linſeed oyl, one third part of Turpentine, Sulphur one part, Tar one third part, and one part of Tallow. After theſe are melted, and being cold, bore two holes in each of the ſame an inch deep with a ſharp Bodkin of Iron, filling the ſame with fine bruiſed Powder, put in each hole a little ſtick of two or three inches long,

long, to be taken out when you would fire the ſame : (This compoſition will burn furiouſly.) If you pleaſe, you may faſten to the ſame receipt on your Pike, divers light Pipes or Canes of Iron, or Braſs of ſix or ſeven inches long, being Piſtoll or Caliver bore (as the Figure marked with B. ſheweth) placing the touch-hole thereof cloſe to the Canvas, boring the ſaid Canvas through, and priming the ſame with fine powder, paſting a paper thereon, and then coat the ſame over as before ſaid ; This being charged with powder and bullet, will do great execution in a throng, either defenſive or offenſive.



Fire

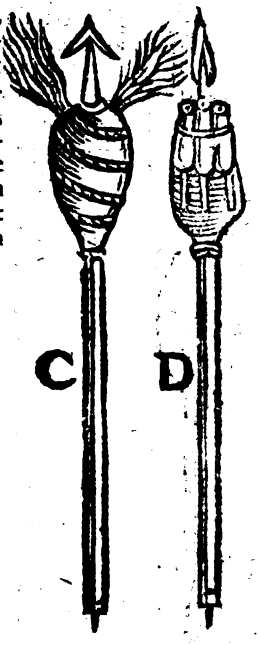
How to arm a Dart or Javelin with Wild-fire, for the Sayls or sides of Ships.

YOu may arm a Dart, Javelin, Partizan, or such like weapon to do excellent service, being in the hand of a valiant Souldier, as you may see by the Letter C. in the same: The same should be filled with the self like Receipt, as before is shewed for the pikes with Wild-fire, which will be a very good weapon for to go into the sides or sails of Ships.

Or you may place upon the staffe of your Javelin certain Pistol barrels of one length, about ten or twelve inches, letting the same into the wood round about the staffe a little, as a Pistol barrel is into the stock (as the Figure marked with the letter D. sheweth) which staffe should have so much substance at the one end, whereto you may nail the same barrels fast at the breech; and about the midst of the same put over a hoop of Iron, as close as ever you can, the which is to be charged in this manner following, *viz.* First charge every barrel with two inches of powder, after put in a bullet a little lower than the bore of the same piece; then take of this slow Receipt following.

Of bruised Powder four parts, of Salt-peter in meal, Linseed Oyl, Brimstone finely beaten, Varnish, and of Willow or hazel cole moistned with a little Vinegar: (of all these five last Ingredients one Part;) which must be well wrought together with the hand in some wooden Vessel, till you feel that it will cling together, of which you must put in after the bullet two inches, and thrust the same together with a Rammer stick; and then again put in two inches of powder, and after that a bullet; and lastly, two inches of this slow Receipt, until you have filled every one of the said barrels within half an inch of the mouth, the which is to be filled up with the said slow Receipt, and powder bruised and mixed together, that it may the sooner fire: This being done, bind a paper over the mouths of the same, until you will use them; and giving

giving fire to any one of the same, it will fire all the other, and every one will discharge three or four shots a piece one after another, to the hurt of the enemy, being used in service either to offend or defend, to the pleasure of the beholders, being used in triumph with bullets of Receipt rolled in tow, and coated with brimstone.



How to enter up a pair of stairs, or to defend ones self, being in a narrow Room.

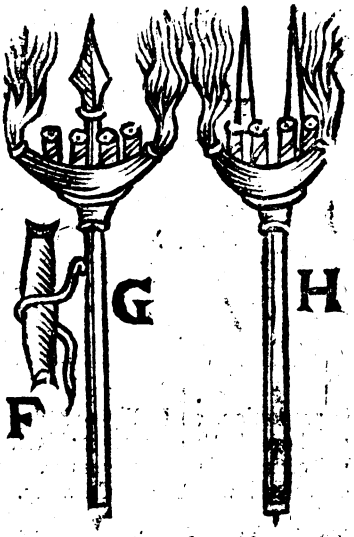
IF you are streightned up in a narrow Room, to defend your self, or would enter up a pair of stairs; where you cannot use a long weapon, you may make a Logget, whose staffe shall be but three or four foot long, arming the same with the same Receipt as was shewed to arm the pikes, whereon you may

place certain pipes of Brass or Iron, charged as before is taught: And if you please, you may put into the end of the staffe, a Rapier blade with a skrew, to take off and on, at your pleasure, as the Figure marked with the Letter E. sheweth.

How to defend a Breach in a Ship or other place of defence.

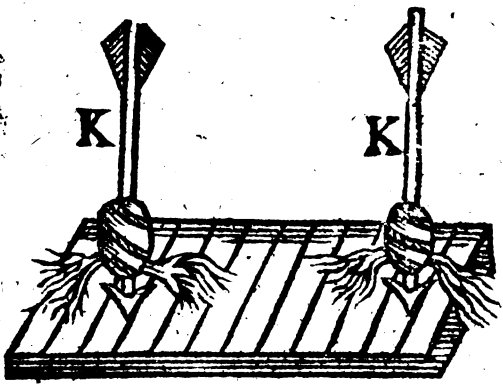
TO perform this, you may arm a Partezan, Javelin, or Fork with Fire-work, and to shoot every one of them with seven or eight pistol of musket bullets in nailing a plate of Iron cross the pike or point of the said Javelin, or between the grains of the fork, piercing certain holes through the same, unto which with a strong wyer, you may make fast on

on either side so many pipes of Iron, of seven or eight inches long, as you think convenient to fix upon either or any of the said weapons, and charging the same with powder, bullet and wad, you may cause the same to fire one after another, in filling a roule of Canvas sewed together, (as the figure F. sheweth,) with slow Receipt, and coated, as before is shewed: And this being placed artificially upon the short barrels or pipes (as the Figure G H. sheweth) and primed with fine powder directly against the Touch holes of the barrels, passing a little paper over the same, firing the said trains at both the ends, which as they burn, shall still discharge the short pieces one after another, to the great hurt of the Adversary.



How to burn Wooden Bridges, Gates, Houses, &c.

TO perform this and the like military Services, if you can come to anoint the same with some such liquid composition as is before shewed for the coating of Fire-works, melting in the same a good quantity of bruised brimstone, and sticking in the same arrows of Wild-fire, made in



in proportion, as the Figure K doth shew. The Receipts may be made as the former for Pikes, with Wild-fire, which will certainly set the same on fire, for the Receipt is so forcible that it will burn in the water.

Devices for cutting of Shrouds of Ships.

ALso to cut the Tackle of Ships, or to do many other good services, either with musket or great Ordnance, it is good to chain two bullets together, as the Figure Y sheweth.

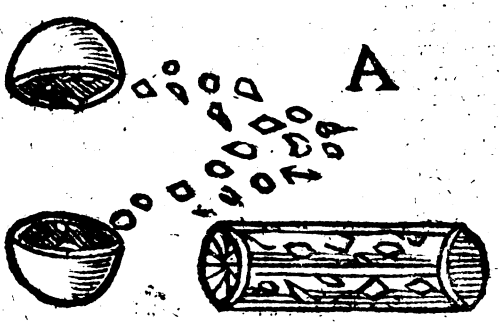
Another.

Another.

ALso for the like purpose aforesaid, if you take a small Iron Chain with good Links, rolling the same together round, that it may go easily into the Piece, close down to the wad, the same being again discharged, will spread it self in length, and do good execution.

How to do excellent Service against an enemy who would enter a Breach, a Gate, a Bridge, a Ship, &c.

IF that the Enemy will enter (and that you intend not to yield) it is necessary to have in readiness divers hollow bullets made of two plates of iron, or other metal, so that the one may close about the other round like a box, which being filled with pebble stones, square pieces of iron, called Dice-shot, musket bullets, or the like, which being discharged out of a murdering Piece, it will do great execution: if you will fill cases of wood, made like unto a Lanthorn with the same stuff, it will perform the like service, being shot out of a Murdering piece: Behold both the figures marked with the letter A.



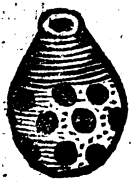
How to prevent a train of Powder laid to blow you up before you enter a Ship, or other place.

IF you imagine that there is ſome train laid to blow you up (as it often happeneth) you may prevent the ſame, by waſhing certain Purſes of Canvas, filled half full of good corn-powder, and with eight or ten fiery bullets of an inch, or an inch and half in height, and filling the other part of the Purſe with ſlow Receipt, you may when you think good (the Receipt being well fired) throw the ſame from you, which will burſt in pieces after the lighting on the ground, and diſperſe the ſaid incloſed bullets here and there, which bullets will burn furiouſly, and if there be any train of powder laid near, it will preſently fire the ſame. The ſaid purſes are very good to throw out of hand, or may be ſhot out of a Morter-piece amongſt men in battle-array, to diſorder them, or into a Town; the Figure B ſheweth how to fill the purſes, and the Letter C. ſheweth the proportion of it, being made up, filled and coated over.

The Receipt for making theſe bullets of Wild-fire following: Take of Sulphur in meal ſix parts, of Roſin, in meal three parts, melting the ſame in ſome pot or pan over a ſlow fire; then take of Stone-pitch one part, of hard Wax one pound, of Tar one fourth part, of Aquavitæ one half-part, of Linſeed-oyl as much, of Verdegreaſe one fourth part, and of Camphire one eight part, melting all theſe together likewiſe, and ſtir into the ſame two parts of Peter in meal; and taking the ſame from the fire put therein four parts of bruiſed powder, working the ſame well together in your hands, and roul the ſame round of the bigneſs that you would have your balls of, boring two holes through the ſame a croſs, which when you would uſe, muſt be primed full of bruiſed Powder; theſe balls will be as hard as ſtone, and need no coating, and being fired will burn furiouſly, and cleave to any thing,

thing, not diminiſhing in quantity being burned to aſhes, which aſhes will kindle an Oaken board: If you pleaſe, you may ſhoot theſe bullets out of a Piece of great Ordnance. The Figures for the Purſes here follow.

B



C

Short, but certain Rules for the making all sorts of fire-works for recreation, as Rockets, Fisgigs, Runners on the Line, Serpents, Stars, Fire-wheels, Clubs, Jack in a Box, *&c.* Together with the quantity of all the ingredients thereunto belonging, and the manner of compounding them.

How to compose a Castle of Fire-works with small charge, that in the firing will yield as much variety, and give as much content as any: Now published for the benefit of young Practitioners. By W. R.

IN all things actual, a certain method is requisite to be observed. Therefore, such as intend to put in Practice these ensuing Instructions, are first to provide themselves of such Rocket Moulds as are suitable to the work they undertake. The description and proportion of them, I conceive somewhat needless, in regard any one may in Crooked Lane, *London*, be furnished with what sizes they please. This being premised, I shall begin with

Fisgigs, by many called Serpents.

THE best way of making them is thus: having provided a small mould without a Needle, make a Coffin of paper fit for it, which choak half an inch from the end, then put it in your mould; and fill up three inches with powder-dust only, finely beaten and sifted, then choak it again, and afterwards fill it about an inch with corn powder then choak it close, and your Fisgig is prepared. To use these on the tops of great Rockets, put into the mouths of them some of the Composition for Stars, which will shew very delectable to the spectators; for after they have continued a good space in the form and manner of Stars, they will then riggle to and fro, like so many flying Serpents. Of these Fisgigs most sorts of Fire works are composed.

When

When you can perfectly make these, you may then proceed to the making

Runners on a line.

AND for them is likewise requisite a Mould, five inches long without a Needle: first make your Coffin of paper, choak it at the end as before, then put it in your mould, and fill it four inches with Powder-dust: (Note that in the filling it, you must put in but a little at a time, and ramm it down close, and so of all others.) Then choak it, and fill the rest of it with corn powder (to give a report) leaving only so much of the Coffin void as will serve to choak it. This being done tye it to a hollow Cane three inches long; so as in tying of it you do not bruise the Rocket. And so have you a single Runner for the Line finished.

If you desire to have a double one to run forwards, and back again, you must then be provided of two Runners made after the manner of the former, only one to be an inch longer than the other: And to finish these, use this method. First tye the long Rocket to the Cane, and at the mouth of it fasten the breech of the short one, by rouling over them a little piece of Paper, with some powder dust in it to give fire to the long one, not forgetting to make a small hole in the breech of the short one with a bodkin, that so the long one may take fire; having done so, then turn back the short Rocket so, that the mouth of it may reach somewhat further than the breech of the long one: left in firing it you accidentally fire both, and by that means spoil your Runners; The best way of tying the double ones is to fasten the short one so, as the long one may be betwixt it and the Cane; for by that means it will run without swagging; whereas if they be both joyned to the Cane, as Mr. *Bates* and some others direct, it is both unsafe, and uncertain; unsafe in this, in case the first accidentally break, the other with the force of it will be struck off; and uncertain it is likewise, in regard after the first Rocket is spent, the Coffin of it coming back will swag and retard the passage of the

the other, and by that means indanger burning of the Line. Let your Line be well rubbed with ſoap: which will both ſecure it from fire and facilitate the paſſage of the runner: likewiſe for theſe and all other, let your Powder-duſt be beaten, and ſifted very ſmall, for the leaſt corn in it may danger the breaking.

How to compoſe a Wheel.

FIrſt provide a Wheel, either round or ſquare, the better ſort are 8 ſquare, made fit to the length of the Rocket, five inches each, the beſt proportion is about ſixteen inches diameter. Now having provided a Wheel, take ſo many Rockets, made after the ſame manner as theſe are which run on the line, which you muſt faſten together, by joyning the mouth of the one to the breech of the other, in the ſame manner as thoſe for the line; in the tying them on, have a care you do not bruiſe them, and be ſure to leave ſome ſpace betwixt the mouth of the firſt, and the breech of the laſt, that ſo by firing the firſt, the laſt may not take, and by that means breed a confuſion.

You may order theſe Wheels to burn either Horizontal or Vertical: for the Horizontal provide a poſt or ſtaff, with a pin on the top of it to put the wheel on; if vertical, then provide a pin faſtned to the ſide.

How to make a Club to caſt forth divers Fiſgigs.

TO do this, firſt cauſe a piece of wood to be turned four inches diameter, let it be bored with an Auger of an inch and half bore from the top towards the bottom, leaving the bottom ſomewhat above an inch thick, and a place underneath to faſten a ſtaff in; the length of it may be about eighteen inches: then draw a line ſpiral-ways about it from the bottom to the top in manner of a ſcrew, each line an inch and half a ſunder; in that line bore ſmall holes an inch aſunder within half an inch of the bottom, and then pierce it through with a Piercer; let your holes be of that bigneſs fit to contain a Fiſgig, and make them ſome-

what

what slope ways, that so the Fisgigs may stand fast, though slack, otherwise they will not come easily forth.

Load your Club or Trunk with the composition following, and then put in your Fisgig made as before, priming each of them, and likewise each hole with powder dust, then fire your Club at the top, and they will fire one after another, and fly about in a confused manner.

The Composition for this Club is.

Roch Peter eight ounces, Sulphur vivum four ounces, powder dust two ounces, Camphire one ounce, Linseed oyl half an ounce, beat and mix these according to the order prescribed in the compositions following.

To make Rockets for the Air.

PRovide first a good mould of what size you please, with a Needle in it, and a Rowler with two Rammers, the one hollow for the Needle and the other sad, to ram it after the Needle is covered. Having made a good strong Coffin of paper fit for the mould, and choaked as before, then fill it with the composition for that size your Rocket is of, the several proportions and mixtures hereafter follow. To fill it, take a little tin scoope, and put in about the twentieth part of the quantity it holds, and then ram it with your hollow rammer, and so continue till you have filled it to the top of the Needle, always beating it down with two or three good strokes of a mallet, then fill in more almost to the top of the Mould, ramming it as before, but with your sad rammer, leaving only so much unfilled as that you may double down some of the paper, and ram it close, making a little hole with a Bodkin to give fire to some corn powder (to give a report) put within that Paper as is left unfolded down, and then choak it, next prime it, as shall be shewn hereafter, and then proceed to heading of it, which you may do several ways, either with Stars, Serpents, Crackers, or golden Rain: the composition for the making these hereafter follows. To place these on the Rocket, first make a thin Coffin of paper, the inside of it somewhat wider than the outside of the Rocket,

which you may fit by rouling it on the outside of the mould, and fitting it to the Rocket, then fasten it to the top of the Rocket, and strew a little powder in it, having first made a small hole in the top of the Rocket, to give fire to it: in this Coffin you may place short Serpents with the mouths downward made as before, or with Stars only, Crackers or golden Rain; having done this, take a piece of thin past-bord, and with a pair of Compasses make a round circle in it, then divide it in two, and with the one half make a cap taper-wise, fit to cover the head, and with glew fasten it to it: then provide a dry Osier stick about eight times the length of the Rocket, straight and flatted at the end, to this fasten the Rocket, tyed at both ends just in the choaking place, that so you may not loosen the composition within, then poise the stick, by ballancing it on your finger three or four inches from the mouth of the Rocket.

The Ingredients for Rockets for the Air of all sizes.

FOr Rockets which contain from one ounce to four, to one pound of powder-dust, put two ounces of Charcole dust: for Rockets which hold from five ounces to ten, to one pound of powder, put two ounces and a half of charcoal dust: and for Rockets which hold from ten to sixteen ounces, to one pound of powder put three ounces of charcoal dust; but be sure that both your powder-dust in this and all other be well beaten, and finely sifted, as likewise your coal-dust. If by trying your composition you find it too strong, you may mend it by adding a small quantity of coal-dust to it: if too weak, then by adding a little powder-dust. My advice is, to mix a pretty quantity together, that so by the tryal of one Rocket you may be ascertained of the rest: for all powder is not of one and the same strength.

Priming for Rockets.

TAke Cotten wick (such as the Chandlers use) and soak it in oyl of Camphire, then take it out and roul it in powder dust, then dry it, and keep it close, otherwise the

the ſtrength of the camphire will decay. The compoſition for Stars will likewiſe fire them.

Compoſition for Stars, and firſt for thoſe of a blue and red colour.

POwder-mealed fine four ounces. Salt-peter two ounces, Sulphur vivum ſix ounces, beat theſe very fine, and then mix them, adding thereto one ounce of Aqua-vitæ, and a quarter of an ounce of oyl of Spike. To make theſe up for uſe, Take a rouler about the bigneſs of an arrow, and roul paper on it, and paſte it cloſe, then fill it with the compoſition before preſcribed; and beat it hard, then cut it into ſhort pieces half an inch in length, dipping one end in glew, and ſtrewing the other with powder duſt, it is then finiſhed, only let it be dry before you uſe it.

A Compoſition of Stars of a very beautiful colour, the eaſieſt, beſt and ſureſt way, never till now made publick by any.

SAlt-peter one ounce, Sulphur vivum one ounce, powder-duſt one ounce, Camphire a quarter of an ounce, beat theſe very fine and mix them, after-wards make paſte of them with the oyl of Turpentine, and then make up little pieces about the bigneſs of a Peaſe, which roul in powder-duſt and let it dry. Of this ſort you may put two or three dozen at the head of an ordinary Rocket, the charge and trouble of making is far leſs than any other way.

To make golden Rain.

PRovide your ſelf of a good quantity of Gooſe Quils, cut them off at the end next the feathers, then fill the quills with the following compoſition, and they will make a very glorious ſhew. To one quarter of a pound of powder-duſt, add half an ounce of coal duſt, and for uſe put the open end of the quill downwards.

To make a Jack in a Box.

PRovide a tin box six inches deep, with a socket made under the bottom of it to place it on a staffe, let it be of what bigness you please, in the bottom of it strew some corn powder almost half an inch thick, then fill it with Serpents, or Fisgigs placed with the mouths downward, leaving a place in the midst for a cane to pass through, which fill with a slow composition; (that for Stars, or these following are very good) then put in the cane, and fasten a cover of pasthoard very close over the box, that so it may not fire before its appointed time.

A composition that burns with a flame slow and sure.

ROch peter four ounces, Sulphur vivum two ounces, Camphire one quarter of an ounce, powder-dust one ounce. Meal these very fine and mix them, adding thereto one quarter of an ounce of Linseed oyl, and a quarter of an ounce of oyl of peter dropped in by degrees, and so wrought to a paste. To meal your Camphire, dip the pestle in oyl of Almonds.

Another sort of mixture that burns sparkling.

POwder-dust four ounces, Coal-dust two ounces; this rammed close in a Cane, renders the sight very delectable to the spectators.

A composition for a white fire, that lasteth long.

SAlt-peter eight ounces, Powder-dust two ounces, *Sulphur vivum* four ounces, Oyl of Peter one ounce, Camphire half an ounce; meal those which are to be mealed, and incorporate them together.

How

How to compose a Castle of Fire-works with small charges, that in the firing shall yield as much variety, and give as much content as any.

FIrst provide an indifferent large frame of wood, four square, with little round Towers of Past-board at the Corners, the best size is 18 inches square, and twelve inches high, let the bottom be made firm to stand on any place, and the sides with gates, (as your fancy shall direct) then fasten on the inside three ledges of wood on each side about, each ledge with a groof made on the top of it, then make so many holes in the frame of wood, suitable to the ledges, as you intend to have the Castle give reports: you may easily make eight to each ledge, which contains 96 reports, you may add more as you see cause; or at the top fasten many Crackers, which at the end will fire like a volley of shot: the manner of making these reports shall be shewed hereafter; and to place them, first prime your groof with a slow composition, and from the uppermost Row to the second put a wick, primed, as for Rockets, and so from the second Row to the third, leaving some hanging forth at the door to fire it, then put in your Reports the mouths inward, fix them to your groofs and cover it close, afterward fit a board four square to cover the top of the Castle, of each side, half an inch broader than the Castle, on the four edges of it you must fasten Pastboard cut stone-work wayes in manner of a battlement, and at each corner, place a small jack in a box with a long Cane in each of them, filled with slow composition, made as before; which Canes let be of the largeness as may burn all the time the Castle is firing: in the midst of the board on the top, place a pin to put a wheel on, made of thin Deal board, five, six or eight inches square, proportionable to the length of the Rockets, which fasten to the board by making holes in it, to tye them to it: on the top of this Wheel you may fasten little Statues of Babies, as Souldiers, Drummers

mers, or the like: and as the Wheel turns, they will move about like Anticks, with much delight to the ſpectators: And ſo have you finiſhed your Caſtle. To fire it, firſt Fire the four Canes, in the four Boxes at the corners, then fire the Wheel at the top, and laſtly, fire the cotten wick at the Gate, and ſo the reports will by degrees fire upwards, and in the end conclude with a volley of ſhot. If it be exactly made, it will continue a long ſpace with abundance of delight.

How to make reports for a Caſtle.

FIrſt make a Coffin of paper choaked as before, of what ſize you pleaſe, then fill it about an inch and a half with corn powder, ramming it cloſe: and at the end ram in a piece of paper as you do to a muſket, leaving the mouth open, and then it is finiſhed: When you uſe them, prime the mouth of it but a little.

How to make Rockets for the Ground.

FIrſt, provide a Rocket (ready finiſhed) as for the fire, then put the breech of it into a bladder, blow the bladder up, and then faſten it at the choaking place, by tying it cloſe: when you fire it, throw it from you, and the force of it when it comes to the ground will make it rebound, and ſo be in a continual agitation.

Experiments

Experiments perform'd by

Legerdemain.

How to make it freeze by the fire side.

THis feat cannot be performed at every time, but only in winter, and at such times as snow may be had, and he that will shew it, must have in readiness an handful of salt. The time serving, and the party provided, let him call for a joynt-stool, a quart pot, and a handful of snow, a little water, and a short staff or stick; first, let him pour a little water upon the stool, and upon it let him set the quart pot, and put the snow into the pot, the salt also, but privately, then let him hold the pot fast with his left hand, and take the short stick in his right, and therewith churn the snow and salt in the pot, as if one should churn for butter, and in half a quarter of an hour the pot will freeze so hard to the stool, that you can scarcely with both hands pull it off from the stool: there is a natural reason may be given for this, which he that is a Scholar need not to be told, and for a common Jugler I would not have so wise as to know, therefore I omit it.

How to make two Bells come into one hand, having put into each hand one.

THis feat must be performed with three Bells, you must put one Bell into your left sleeve, then put one bell

into one hand, another bell into the other hand (they must be little Morris Bells) withdraw your hand, and privily convey the bell in your left hand into your right hand: Then stretch both your hands abroad, and bid two folks hold your hands fast, but first shake your hands, and say, do you hear them. The Bell that is in your sleeve will not be known by the ratling, but that it is in your hand: Then say, he now that is the arrantest Whoremaster or Cuckold of you both shall have both the bells, and the other shall have none at all: open your hands then and shew them, and it will be thought that you deal by Art Magick.

How to make a Jugling Book, or Book of Waggery.

YOu must provide a Paper-book in Octavo, of what thickness you please, first turn over seven leaves of it, and then upon both the open sides, draw or paint the pictures of flowers, then turn over seven leaves more and paint the very same; do this untill you have turned the book once quite over; Then unto the farther painted leaves, paste a little slay of paper or parchment one directly over another. Then turn over the book again, and having turned every sixth leaf, draw the picture of flower-de-luces, and then paste stayes of parchment upon them as you did upon the first; but these stayes must all of them be a little lower than the former. Then turn over the book again, and after the fifth leaf throughout the book is turned, paint horns: do thus until you have painted the book full of pictures, only let there be one part of the leaves fair paper; having thus finished the book, when you use it, hold it in your left hand, and with your right hand, your thumb set upon the parchment stayes, shew them orderly and nimbly, but with a bold and audacious countenace, for that must be the grace of all your tricks: say, This book is not printed thus as some of you may suppose, but it is of such a property that whatsoever bloweth on it, it will give the representation of whatsoever he is naturally addicted unto, and then turn the book, and say, see it's all fair paper. *Boxes*

Boxes to change Grain.

MAke one Box of Wood, Tinne, or Brass: let the bottom fall a quarter of an inch into the box, and glew thereon a laying of barley, or such like grain: draw the box with the bottom downwards, and say, Gentlemen, I met a Countrey-man going to buy barley, and I told him I would sell him a penny worth, also I would multiply one grain into so many bushels as he should need, then cast a barly-corn into your box, and cover it with a hat, and in the covering it, turn the bottom upside down: then cause some body to blow on the hat, then uncover it, and they will think strangely of it. You may make another box of wood like unto a bell, to hold so much just as your former box will, and make a bottom unto this box of shooe-soal leather, to thrust into the bottom of the bell: then fill it with barley, and thrust up the leather bottom, for it will keep the barley from falling out, take this box out of your pocket, and set it down gently upon the table, and say, I will not cause all the barley to go out of my measure into my bell, then with a hat cover the box that hath the barley glewed unto it, and in covering it, turn it with the barly downward, then say, first, let us see whether there be nothing under the bell, and clap it hard down upon the table, so the weight of the barley will thrust the bottom down; then bid some one blow hard on the hat, then take it up, where they will see nothing but an empty measure, then take up the bell, and all the barley will pour out. Sweep it then presently into your hat or lap, lest their busie prying may chance to discover your leather bottom.

A Conceit to procure laughter.

TAke a ball in one hand, and another in the other, and stretch your hands as far as you can one from the other, and if any will, lay a quart of wine with him that you will not withdraw your hands, and yet will make both

of them come into either hand they please. It is no more to do, than to lay one down upon the table, and turn your self round, and take it up with the other hand, and your wager is won: and it will move no small laughter to see a fool to lose his money.

How to knit an hard knot upon an handkercher, and to seem to undo the same with words.

MAke one plain loose knot, with the two corner ends of a handkercher, with seeming to draw the same very hard, hold fast the body of the said handkercher (near to the knot) with your right hand pulling the contrary end with the left hand, which is the corner of that which you hold. Then close up handsomely the knot, which will be yet somewhat loose, and pull the handkercher so with your right hand, as the left hand end may be near to the knot: then will it seem to be a true and firm knot: and to make it appear more assuredly to be so indeed, let a stranger pull at the end which you hold in your left hand, while you hold fast the other in your right hand; and then holding the knot with your fore-finger and thumb, and the nether part of your handkercher with your other fingers, as you hold a bridle, when you would with one hand slip up the knot, and lengthen your reins. This done, turn your handkercher over the knot with the left hand, in doing whereof, you must suddenly slip out the end or corner, putting up the knot of your handkercher with your fore-finger and thumb, as you would put up the aforesaid knot over your bridle. Then deliver the same (covered and wrapt within the midst of your handkercher) to one to hold fast, and after the pronunciation of some words of art and wagers laid, take the handkercher and shake it, and it will be loose.

How

How to transform any one small thing into another form by folding of paper.

TAke a sheet of paper and fold or double the same, so as one side be a little longer than the other: then put a Counter between the two leaves of the paper up to the middle of the top of the fold, holding the same so as it be not perceived, and lay a Groat on the outside there right against the Counter, and fold it down to the end of the longer side: and when you unfold it again, the Groat will be where the Counter was, and the Counter where the Groat was, so as some will suppose that you have changed the mony into a Counter, and with this many feats may be done.

How to convey Money out of one of your hands into the other by Legerdemain.

FIrst you must hold open your right hand, and lay therein a teaster, or some big piece of money, then lay thereupon the top of your long left finger, and use some words of Art, and upon the sudden, slip your right hand from your finger, wherewith you held down the teaster, and bending your hand a very little, you shall retain the teaster still therein, and suddenly drawing your right hand thorow your left, you shall seem to have left the teaster there, especially when you shut in due time your left hand. Which that it may more plainly appear to be truely done, you may take a knife, and seem to knock against, so as it shall make a great sound: but instead of knocking the piece in the left hand (where none is) you shall hold the point of the knife fast with the left hand, and knock against the teaster held in the other hand, and it will be thought to hit against the money in your left hand. Then after some words of Art pronounced, open your hand, and, when nothing is seen, it will be wondered at, how the teaster came removed.

How to make a Six-pence seem to fall through a Table.

YOu must have an handkercher about you, having a Counter neatly sewed in one of the corners of it: take it out of your pocket, and desire some body to lend you a tester, and seem to wrap it up in the midst of the handkercher, but retain it in your hand, and instead of so doing wrap the corner in the midst that hath the Counter sewed in it, and then bid them feel if it be not there, which they will imagine to be no other than the tester that they sent you, then bid them lay it under a hat upon the table, and call for a basin of water, hold it under the table and knock, saying *vade*, come quick, and then let the six-pence fall out of your hand into the water. Then take up the hat, and take the handkercher and shake it, saying, it is gone, then shew them the money in the basin of water.

How to seem to blow a six-pence out of another mans hand.

TAke a six-pence, blow on it, and clap it presently into one of your spectators hands, bidding them to hold it fast: Then ask of him if he be sure to have it, then to be certain, he will open his hand and look. Then say to him, Nay but if you let my breath go off, I cannot do it. Then take it out of his hand again, and blow on it, and staring him in the face, clap a piece of horn in his hand, and retain the six-pence, shutting his hand your self. Bid him hold his hand down, and slip the tester between one of his cuffs. Then take the stone that you shew feats with, and hold it unto his hand, saying, *By vertue hereof, I will and command the Money to vanish, yet hold in your hand; Vade*, now see: when they have looked, then they will think that it is changed by the vertue of your stone. Then take the horn again and seem to waft it from you, retaining it, and say, *Vade*, and anon say you have your money again: He then will begin to marvel, and say, I have not: say then to him again, you have, and I am sure you have it: Is't not in your hand? If it be not there; turn down

one

one of your ſleeves, for it is in one I am ſure, where he findeth it, he will not a little wonder.

How to caſt a piece of Money away, and to find it in another mans mouth, pocket, or purſe.

THe Jugler calls for ſome one piece of Coin, as a teaſter or a ſhilling of any one in the company, he willeth him to mark it with what mark he will, then he taketh it, and caſteth it away, and cometh to his confederate (who is furniſhed beforehand with the like piece of Coin, marked with the very ſame mark) and bids him deliver the money out of his pocket, purſe, or if he ſay the word mouth; for this is concluded of before-hand. Now this confederate, to make the matter ſeem more ſtrange, will fume and fret, asking how he ſhould come by it, till having found the mark, he will confeſs it to be none of his, wondring at his skill, how he ſhould ſend it thither: and all the reſt be taken with a real admiration of his extraordinary cunning.

How by the ſound of a Counter phillipped to tell what ſide is uppermoſt, whether croſſe or pile.

THe Jugler draws a Counter out of his pocket, and ſaith to the company, See here is a Counter, take it who pleaſe, and let him phillip it up, and I will by cunning tell you whether croſs or pile be uppermoſt by the very ſound, for you ſhall hoodwink me. Now there are three, or four, or more confederates in the place, who ſeeming ſtrangers as well as the reſt, will be very importunate to have the phillipping it, and before one of theſe ſhall have it, who by ſome ſign of the fingers or countenance (foreknown to the Juggler) do give him information after he is demanded. Of the ſame nature is that trick formerly mentioned in the book, and called, The decollation of *John Baptiſt*.

To make one dance naked is a trick of the ſame nature, for the party afore-ſaid is agreed to do it, and alſo the

manner and circumſtances: So that the Jugler to blind the people, pronounceth ſundry words to ſuch a perſon, he then begins to rave like a mad Man, and puts his cloaths off with a kind of violent careleſneſs, though, God knows, the party knows as well what he doth, as your ſelf that reads it.

After the ſame manner ſhall you know what money another hath in his purſe, and caſting mony into a pond, and finding it under a ſtone or threſhold in another place.

Alſo to make a piece of money to leap out of a cup and run to another, by means of a ſmall hair faſtned to the money, which hair the Confederate guideth: with a multitude of ſuch like ſtrange feats, which may ſeem impoſſible to the judgement of the common people to be effected without aſſiſtance of the Devil, or ſome familiar, which to nominate is neither needful, nor will my occaſions permit ſo much leiſure as to do it.

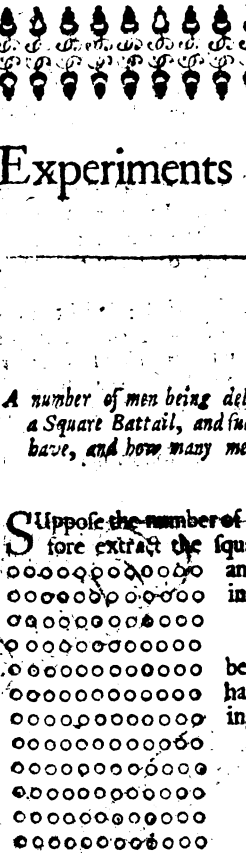
Experiments

Experiments in Arithmetick.

I.

A number of men being delivered to an Officer to make thereof a Square Battail, and suddenly to tell how many ranks he shall have, and how many men in each rank.

Suppose the number of men delivered to be 144. therefore extract the square Root of 144, which is 12, and so many men shall you have in flank, and as many in file.



Note that if the number had not been a square number, there would have been some odd men remaining.

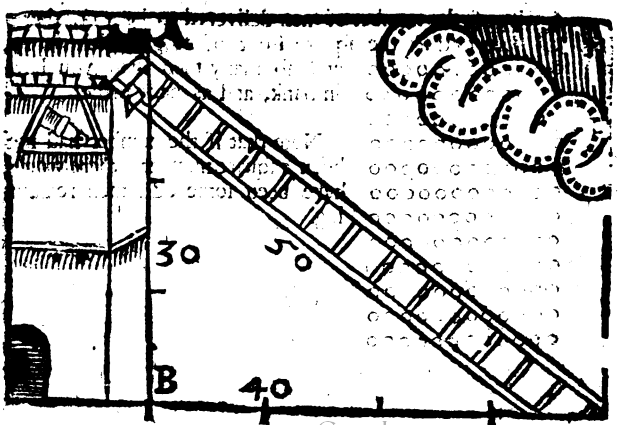
II.

The wall of a Fort or Caſtle being thirty foot high, and the breadth of the Trench about the wall forty foot broad, I demand the length of a ſcaling-Ladder that will reach from the edge of the Trench to the top of the wall.

This experiment is grounded upon the 47 Propoſition of the firſt of *Euclid*, who ſaith, In all right-angled triangles, the ſquare of that ſide which lieth againſt the right angle, is equal to the two ſquares of both the other ſides.

From whence we may gather, that if the height of the Wall be ſquared, and the breadth of the Trench likewiſe ſquared, and thoſe two ſquared numbers added together, and from them extract the ſquare Root, that Root ſo extracted ſhall be the length of the Scaling-ladder required.

As for Example, in the Figure following.



Let

Let A B. represent the Fort, being 30 foot high, and B C the breadth of the Trench, 40 foot, then square 30, *fecit* 900, likewise square 40, *fecit* 1600: which added make 2500, the Root of which number is 50, the length of the Hypothenusal or Scaling ladder required.

III.

Admit the Semidiameter of the earth to be 3346 miles, and that there is a Mountain one mile in height; I demand how far such a Mountain may be seen at Sea or on Land.

ADD the Semidiameter of the earth and the Mountain together, *fecit* 3437, whose square is 11812969. From which substract the square of the semidiameter of the earth, viz. 11806096, there remains 6873, whose Root is 82 and three fourths; wherefore you may conclude, that the Mountain may be seen almost 83 miles.

IV.

The General delivered to his Master Gunner 5 Pieces of Ordinance, together with 168 pound of powder, the biggest of which Pieces spent at a shot 6 pound, the second 4 pound, and the third 2 pound, who commanded him to employ them against the battery of a Sconce, demanding of the Gunner how many shots each piece would make, being discharged one as often as another, and also how much powder each Piece would spend.

LEt the quantity of each Piece be set down into order, one under another, and added into one entire sum, as 6.4.2 *fecit* 12, behind which towards the right hand set down the summe of the Powder delivered, *viz.* 168, which if you divide by 12, the quotient will be 14, which certainly telleth that they will make 14 shots a piece against the Sconce.

lib.	
6 *lib.*	
4 *168 sh.*	
2 *xx*	14
12 *x*	

lib.
84
56
28
168

Now to know how much powder each Piece will spend: multiply 14 by 6, *facit* 84, for so much will the first Piece spend; again multiply 14 by 4, *facit* 56, so much will the second spend; and lastly multiply 14 by 2, *facit*. 28. so much will the last Piece spend: which being added into one entire summe, the total will be 168 pound which is equal to the powder by the General at first delivered.

A General having drawn the platform of a Fort, demanded of 50 Pioneers what time they required to finish it in? who replied 6 weeks, or 36 dayes (which is all one) but the expedition was such that it must be finished in 8 dayes; now would I know what number there must be employed.

THE resolution of this question to some may seem difficult, but to others very plain and easie, for if you multiply 50 (which is the number of Pioneers) by 36 (the number of days which they require) and divide that product by 8 (which is the time that the Fort must be finished in) the quotient of that division will be 225, and so many must be imployed to finish it in eight days.

Pleasant

Pleaſant QUESTIONS IN ARITHMETICK.

Queſtion I.

To tell the number that another man ſhall think, be it never ſo great.

LEt the party that thinketh, double the number which he thought; which done, bid him multiply the ſum of them both by 5, and give you the product (which they will never refuſe to do, it being ſo far above the number thought) from the which if you abate the laſt figure of the product (which will always be a Cipher or 5) the number thought will remain.

Example.

Let the number thought be 53, which doubled maketh 106, and multiplyed by 5 makes, 530, then if you take away the Cipher which is in the laſt place, there will remain 53, the number thought.

Queſt.

Quest. II.
Of the accusation of a Thief.

A Thief breaking into an Orchard, stole from thence a certain number of Pears, and at his coming forth he met with 3 men one after another who threatned to accuse him of theft; and for to appease them, he gave unto the first man half the Pears that he stole, who returned him back 12 of them. Then he gave unto the second half of them he had remaining, who returned him back 7. And unto the third man he gave half the residue, who returned him back 4, and in the end he had still remaining 20 Pears. Now do I demand how many Pears he stole in all? To answer this question you must work backward; for if you take 4 from 20, there will remain 16, which being doubled make 32, from which abate 7, and there will remain 25, which being doubled makes 50, from which subtract 12, and there will remain 38, which again doubled make 76, the true number of Pears that he gathered.

Quest. III.
Of three Sisters.

A Certain man having three Daughters, to the Eldest he gave 22 Apples: to the second he gave 16 Apples: and to the third he gave 10 Apples: and sent them to the Market to sell them, and gave them command to sell one as many for a penny as the other (namely 7 a penny) and every one to bring him home so much money as the other, and neither change either apples or moneys one with another; How could that be?

This to some may seem impossible; but to the Arithmeticians very easie. For whereas the eldest had 3 peniworths and one apple over, the second two peniworths and two apples over, and the youngest had one peniworth and three apples over: So that the youngest had so many single apples, and one peniworth, as the eldest had peniworths

worths and one apple over, and consequently the second proportional to them both.

They made their Markets thus: A Steward coming to buy fruit for his Lady, bought all the apples they had at 7 a peny, leaving the odd ones behind, then had the eldest Sister three-pence and one apple, the middle Sister two pence and two apples, and the youngest one penny and three apples. The Steward bringing the fruit to his Lady, she liked it so well, that she sent him for the rest; who replyed that there were but few remaining, she notwithstanding sent him for them, and bid him bring them at any rate. The Steward coming to the Market again, could not buy the odd apples under a penny a piece (who to content his Lady was fain to give it) then had the youngest Sister three peniworth, the middle Sister two penyworths, and the eldest one penyworth, and so had they all four pence a piece, and yet sold as many for a peny one with another, and neither changed apples nor moneys one with another, as they were commanded.

Quest. IV.

Of one that bought and sold both at a rate, and yet in the end proved a Loser.

A Man bought 100 Egges at three a penny, having 120 to the hundred, also he bought a hundred more at two a penny, having likewise 120 to his hundred, these Egges being mingled, he sold them away for 5 two pence, and 120 to the hundred as he bought them, the question is whether he gained or lost in that bargain.

If you work by the Rule of Three Direct, you shall find that his 120 Eggs at 3 for a penny came to three shillings four pence, and his 120 at 2 for a penny came to 5 shillings, which being added make 8 shillings, 4 pence. Then again to see what they come to at 5 for 2 pence; work likewise by the rule of Three Direct, and you shall find that 240 at 5 for 2 pence, come but to 8 shillings, whereby the seller loseth 4 pence of the money they cost him.

Experiment

Experiments in Geometry.

I.

How to take the Altitude of a Building, or other approachable height by a line and plummet, the Sun shining.

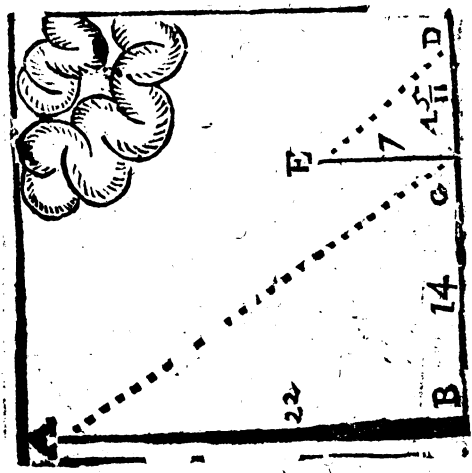
LEt the Building whose Altitude you desire to know, be A B representing a May-pole casting his shadow in a right line on the ground to C, at C let fall a line and plummet (whose length before you know in feet or inches) observing where the end of that shadow lights; which suppose at D, then measure the length of the shadow of the string, and consequently the shadow of the building, both which being exactly taken, work thus by the Rule of Proportion?

If C D, the shadow of the line and plummet 4 foot, and $\frac{5}{11}$ give E C 7 foot in altitude;

What altitude doth 14 feet give, which is the length of the shadow of the May-pole?

Multiply and divide according to that Rule, and you shall find in your quotient 22 foot, which is the true altitude of the building required.

How



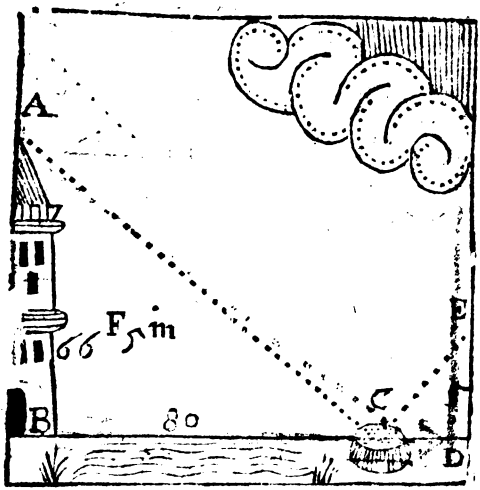
II.

How to take the Altitude by a Bowl of water.

PLace on the ground a Bowl of water, which done, erect your body ſtraight up, and go back (in a right line) from the building, till you eſpy in the Center or middle of the water the top of the Altitude; which done, obſerve the place of your ſtanding, and meaſure the height of your eye from the ground, together with the diſtance from your ſtanding to the water, and the diſtance of the water to the Baſe or foot of the Altitude; which being all exactly taken, will help you to the Altitude required, by the rule of proportion.

Example.

Let the Altitude required be A B, the Bowl of water placed on the ground at C, then go backwards from C (your body erected as ſtraight as may be to tie your eye at E, ſpy the top of the Altitude A B in the water, which found, obſerve the place of your ſtanding at D, and mea-



ſure the altitude of your eye to the ground, which is 5 foot, and likewiſe the diſtance from D to C, which is ſix foot, then meaſure the diſtance from C to B, which is 80 foot, theſe 3 diſtances work by the rule of proportion. Thus, *As the diſtance C D is to the Altitude E D, So is the diſtance C B to the Altitude A B: which is 6 foot and 8 inches.*

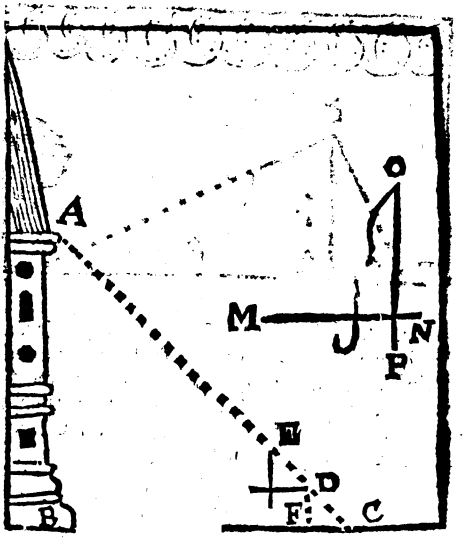
III.

How to find the Altitude of a building by two ſticks of one length joyn'd in a right angle, without Arithmetick.

CAuſe two ſticks to be joyned in a right angle, as is in the figure M N, and O P, having at O a hole made wherein to hang a thread and plummet.

The two ſticks being thus prepared, come to the building whoſe altitude you require (which building let be A B,) then applying the end A of your croſs ſtaffe to your eye, hold it up or down till the thread and plummet hang juſt upon the line C D, then go back or forward (as occaſion

casion is given) till your eye at D looking over E espy the top of the building at A; which found, mark well the place of your standing, which is at F, and measure the distance from your eye to the ground, which is D F, and set that same distance off from F to C, then measure the distance from C to B, for that is the true height of the building A B, as may appear by the figure, and likewise by the Theorem on which it is grounded.



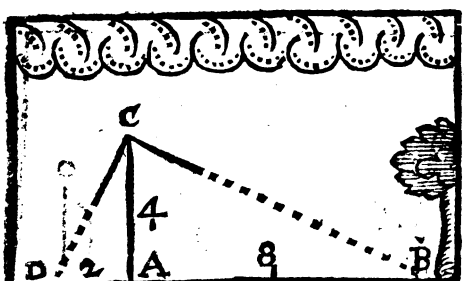
I V.

How to find a distance by the two Sticks joyned square.

THis Experiment is grounded upon the 4 *Prop.* of the 6 of *Euclid.*

Let the distance which you desire to know, be A B. set up a staffe at A. of 4 foot long, (or more or less at your pleasure,) at A C. at the end of the staffe C. place a thread C D. then hanging the angle of the square O. on the top of

the ſtaffe at C. lift it up or down, till you ſee the farthest part of your Longitude, the ſquare ſo remaining, and the ſtaffe not removed, draw the ſtring that is faſtned at C. cloſe by the ſide of the ſquare, till it touch the ground at D. then meaſure how many times the diſtance D A. is contained in the ſtaffe, for ſo many times is the ſtaffe contained in the Longitude.



Example. The ſtaffe ſuppoſed 4 foot high placed at A. and the ſquare being hung thereon at C. the one end thereof pointing at B. and the other to D. then meaſure the diſtance D A, and you find it to be two foot, then ſay, if C A contain D A two times, A B ſhall contain C A as many, that is 8 foot, as may appear by the figure.

V.

How to meaſure the ſolidity of a Cube.

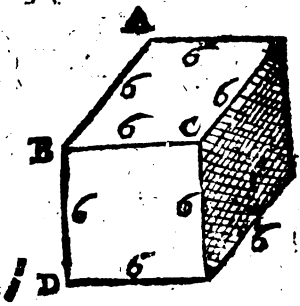
THe Cube is a body compoſed of 6 ſquare ſuperficies of equal proportion, and is meaſured in manner following.

If you multiply any one ſide in it ſelf cubically, it produceth the ſaid Cube.

Example.

Example.

Let the Cube A B C D be given to be measured, the sides whereof are six inches in length, the square whereof is 36, which again multiplyed by the root produceth 216, which is the content of a Cube in inches whose sides are six inches in length.



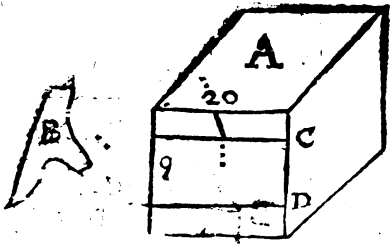
VI.

How to measure the solid content of any body how irregular soever it be, the form or fashion not regarded.

TO perform this you must prepare an hollow Cube, into which put your irregular body, which being placed therein, you shall pour in so much water till it no more than cover the body in the Cube, then make a mark in the inside of the Cube where the superficies of the water toucheth. This done, take out the irregular body, and mark again directly under the former, where the brim of the water now toucheth, for the distance of these 2 marks multiplyed by the square of the Cubes side produceth the crassitude of that irregular body.

Example.

Suppose A. to be the cubical hollow vessel, whose inward side suppose to be twenty inches: B the irregular body whose Crassitude I desire. First, therefore I put *B.* into the hollow Cube A. and pouring in water till it be throughly covered, admit the brim of the water reach unto C, then takin-



taking out that irregular body again, admit the ſuperficies of the water fall to D. then meaſure the diſtance between C. and D. which ſuppoſe is 9 inches, which multiplyed in 400, the ſquare of the Cubes ſide produceth 3600. and ſo many cubical inches are contained in the irregular body B.

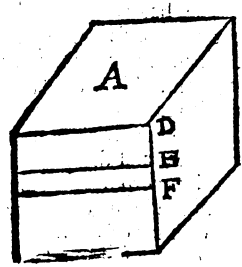
Vſe I.

How the Weight of any part or portion of a ſolid body may be known, without ſeparation thereof from the other part of the body.

HAving a Cube prepared as before declared, firſt, put the ſolid body thereinto, which done fill the Cube top full of water, then ſoftly lift that body out of the water, till ſuch time as there remain no more in the water than that proportion whoſe weight you deſire to know, at that inſtant make a mark on one ſide of the Veſſel where the ſuperficies of the water then toucheth, then take out the body all together, this done, meaſure the diſtance from the former mark to the ſuperficies of the water as it is now after the body is taken quite out. Likewiſe meaſure the diſtance of the waters ſuperficies from the top of the Cube, which done, augment the weight of the whole body by the leſſer diſtance, and divide by the greater, your quotient will ſhew the true weight of the fragment required.

Example.

Example.



Admit B C to be in all 100 pound weight being either brass, iron, silver, lead, stone, or other mettal, my desire is to know the weight of the portion C. first therefore putting the whole body into the vessel A. I fill it full of water, then lifting it softly up till all the body be out of the water, excepting C. I find the superficies of the water to be fallen to E. where I make a mark, then take out the whole body, admit the water is fallen to F. and that by measuring I find E F. to be 8 inches, and D F. 20 inches, 8 multiplyed in 100, (the whole pillars weight) yieldeth 800. which divided by 20 (the greater distance) bringeth in the quotient 40, so many pound weight I conclude the portion C. to weigh.

VIII.

How Archimedes *found what quantity of Gold was taken out of the King of the* Syracusans *Crown, and how much silver put in the room thereof, without breaking of the Crown.*

Hiero King of the *Syracusans* in *Sicilia* had caused to be made a Crown of gold of a wonderful weight to be offered for his good success in the wars; in making whereof, the Goldsmith fraudulously took out a certain portion of gold, and put in silver for it, so that there was nothing abated of the full weight, although much of the value diminished: Which thing at length being uttered, the King was sorely moved, and being desirous to try

the truth, without breaking of the Crown, proponed the doubt to *Archimedes*, unto whose wit nothing seemed impossible, which although he could not presently answer, yet he had good hopes to devise some policy for that invention, and so musing thereon, as he chanced to enter into a bane full of water to wash him, he observed that as his body entred into the bane, the water did run over; whereby his ready wit of such small effects conjecturing greater works conceived by and by a reason of solution of the Kings question, and therefore rejoycing exceedingly (more than if he had gotten the Crown it self) forgot that he was naked, and so ran home crying as he ran, *inveni, invent*, I have found, I have found, and thereupon caused two massie pieces, one of gold and another of silver, to be prepared of the same weight that the Crown was of, and considering that gold is heavier of nature than silver, and therefore gold of like weight with silver, must needs occupy less room by reason of its more compact and sound substance; he was assured that putting the mass of gold into a vessel brim full of water, there would not so much water run out, as when he should put in the silver mass of like weight. Wherefore he tryed both, and noted not only the quantities of the water of each time, but also the difference or excess of the one above the other, whereby he learnt what proportion in quantity is between gold and silver of equal weight, and then putting the Crown it self into the water brim full (as before) marked how much water did run out then, and comparing it with the water that run out when the gold was put in, noted how much it did exceed that, and likewise comparing it with the water that run out when the silver was put in, marked how much it was less than that, and by those proportions found the just quantity of gold that was taken out of the Crown, and how much silver was put in instead of it; by the which ever since the proportions of metals one to another are tryed and found.

IX.

IX.

How a man may descend into the bottom of any Water or River, his body remaining dry.

THis Experiment was shewed at *Toledo*, by two *Greeks*, who taking a Cauldron of great capacity the mouth turned downward, and so hanging it in the air by ropes, they fasten certain shelves in the midst of the Cauldron, where they place themselves and a fire. Then to make it hang at *æqua libra*, they compass the Circumference thereof with leaden plummets on every side equally, and made of equal weight, lest any part of the Circumference of the mouth of the Cauldron when it is equally and softly let down into the water, should sooner touch the water than the whole Circumference, so should the water easily overcome the air inclosed in the Cauldron, and resolve it into moisture. But if by due proportion (the Cauldron thus prepared) be softly set down into the water, the air inclosed in the Cauldron (by resistance of the water) shall violently make himself place, not admitting the water to enter. So the men there inclosed, shall so long remain dry in the midst of the water, untill success of time do by respiration weaken and consume the inclosed air. But if in due time the Cauldron be softly and equally drawn out of the water, the men shall remain dry, and the fire not extinct.

This Experiment may thus be proved.

Take a Cup or Glass of a certain quantity, the Circumference of the mouth whereof shall be broader than the Circumference of the bottom, in the mouth whereof let be fastned a little stick, tying thereto a thread and plummet. On the stick fasten a little Candle of Wax, whose light may come only to the middest of the Cup, lest too much nearness of the water might suffocate the Candle; Then proportionably (as in the former Experiment) put the cup

with the burning Candle into a Veſſel full of water, and in due time draw it out ſoftly and equally, ſo that no part of the mouth or Circumference thereof be drawn out before the whole, ſo ſhall the Candle remain burning as it was when it went in.

X.

To break a ſtaff upon two Glaſſes of water.

PLace the Glaſſes being full of water upon two joynt Stools, or ſuch like, equidiſtant from the ground, and diſtant one from another, the length of the Staffe; Then place the ends of the Staffe upon the edges of the two Glaſſes, ſo that they be ſharp; this done, with all the force you can, with another Staffe ſtrike the Staffe which lies on the Glaſſes in the midſt, and it will break, without breaking the Glaſſes or ſpilling the water.

XI.

To make a Glaſs of water ſeem to boil.

TAke a Glaſs near full of water, and ſetting one hand upon the foot of it, hold it faſt, turn ſlightly one of your fingers of your other hand upon the brim or edge of the Glaſs, having before privately wet your finger, and ſo paſſing ſoftly on with your finger in preſſing a little, the water will ſeem to boil and leap over the Glaſs by drops.

XII.

How to know the hour of the Day by the hand and fingers.

TAke a ſtraw or the like, of the length of the Index, or the ſecond finger, hold this ſtraw very right between the thumb and the right finger, then ſtretch forth the hand, and turn your back and the palm of your hand towards the Sun, ſo that the ſhadow of the muſcle which is under

under the thumb touch the line of Life, which is between the middle of the two other great lines, which is seen in the palm of the hand; this done, the end of the shadow will shew what of the clock it is, for at the end of the great finger it is 7 in the morning, or 5 in the evening, at the end of the ring-finger, it is 8 in the morning, or 4 in the evening, at the end of the little finger, or first joynt, it is 9 in the morning, or 3 in the afternoon, 10 and 2, at the second joynt, 11 and 1, at the third joynt, and mid-day in the line following, which comes from the end of the Index; Note that this Experiment must be perform.d by the left hand.

XIII.

How to make two Images, one of which shall light a Candle, and the other blow it out.

UPon the side of a wall make the figure of two Images, in the mouth of each put a pipe or quill, so artificially that it be not perceived, in one of which place Salt-peter very fine, and dry and pulverised, and at the end set a little match of paper, in the other quill Sulphur beaten small. Then holding a lighted Candle in your hand, say to one of those Images by way of command, blow out the Candle, then lighting the paper with the Candle, the Salt-peter will blow out the Candle immediately, and going to the other Image, (before the snuff of the Candle be out,) touch the Sulphur with it, and say, Light the Candle, and it will immediately be lighted.

XIV.

How to make a Clock with one wheel.

MAke the body of an ordinary Dial, and divide the hour in the circle into 12 parts, make a great wheel in height above the Axle-tree, to the which you shall place the Cord of your counterpoise, so that it may descend, that in 12 hours of time your Index or Needle make one revo-

lu-

lution, which may be known by a Watch, then put a ballance, which may ſtop the courſe of the Wheel, and give it a regular motion, and you ſhall ſee an effect as juſt from this, as from a Clock with many Wheels.

XV.

To find what is hidden in two hands.

SUppoſe that a man holds divers things in his hands, as Gold and Silver, and in the one hand he holdeth the Gold, and in the other the Silver, now to know which hand the Gold is in, and which the Silver; appoint for the Gold 4 ſhillings, and for the Silver 3 ſhillings or any other prices, ſo one be odd, and the other even, then bid him triple that which is in the right hand, and double that which is in the left hand, then bid him add theſe two products together, and ask him if it be even, or odd; if it be even, then the Gold is in the right hand; if odd, the Gold is in the left hand.

XVI.

To make a Cone to move by the edge of a Table.

MAke therefore a Cone of paper, and ſet it on the Table, cunningly conveying under it a Beetle, or ſuch like creeping thing, and you ſhall ſee the thing to move on the Table, as if the paper were a living creature.

How with three Pots of 8. 5. 3. *pints, to part* 8 *pints of Wine into two equal parts. Pots* A. B. C. *Pints* 8. 5. 3.

EMpty A. into B. B. into C. C. into A. B. into C. ſo in (B the meaſure of 5 pints,) there will remain four pints. Then Empty C. into D, and C. will have nothing but A. will likewiſe have four pints.

To

To cause Water (contrary to the Nature thereof) to ascend.

PRepare a Bason with a pint of water in it, or thereabouts, then take an earthen Pot or Jugg, with a round belly, (fittest for this service) and light a piece of paper, cast it into the Jugg flaming, then turn quickly the mouth of the Jugg downward, and set it on the midst of the Bason of water; it will suck up all the water, if it be no more than it can receive and contain in the belly of it.

To carry a Jugg or earthen Pot, sticking without any thing, to the palm of your hand.

TAke a piece of paper, set it on fire, and cast it flaming into the mouth of the Jugg, presently clap the palm of your hand on the mouth of the said Jugg or Pot, not hollow, but plain and smooth, the Jugg will not fall from your hand, but you may walk many paces, and carry the same sticking unto the palm of your hand, unless, by Violence, you pluck it away.

To make white Letters appear on a black piece of Paper.

BEat both the yolk and white of an Egg, well together, until it be liquid like Writing ink, write your mind therewith on paper, suffering it to dry, then wash over your paper with some black Colour, such as Printers Ink is, and put it by till both be dry, then take your knife and scrape over the superficies of the paper, and the Letters formerly written will come forth, and whites appear in their room.

To write on Parchment, and the Letters not to be seen, &c.

ASsoon as you have written on Parchment, hold it to the Candle or heat of the fire, and it will shrivel together, and run into it self in such wise as not a word scarce can be read; When you would have it Legible, but it in a wet or moist place, or sprinkle it gently with water, and it will extend in length again.

To get out and deface the Writings, or blots upon Parchment.

TAke a Pencil and wash the place, or the Parchment with *Aqua-fortis*, and the Ink will come out.

To make an Old Writing appear Fair.

TAke Galls and boyl them in Wine, and wash the Writing therewith.

To take the impression of the Seal of a Letter.

MElt a little brimstone, casting in some white Lead, put this mixture on the Seal, strengthning it with a small piece of paper, a little bigger then the impression is; being cold take it of, and you shall find the print of the Seal thereon.

How to write a Letter secretly that cannot easily be discovered or suspected.

1. WRite your mind at large on one side of the paper with common Ink, and on the other side with Milk, that which you would have secret; and when you would make the same legible, hold that side which is written with Ink to the fire, and the milky Letters will shew bluish on the other side.

2. Rule two papers of one bigness, with lines of an equal distance, make the one full of glass Windows, through which you must write your mind upon the second Paper, then fill up the spaces with some other words at your pleasure; but if all were made to hang together in good sence, it would carry the less suspicion, each Friend must have one of these cut papers to read all such Letters: for without the paper it will trouble a good Decipherer to read the Letter.

Many Cards placed in divers ranks, to find which of these Cards any one hath thought.

TAke 15 Cards and place them in 3 heaps, rank wise, 5 in a heap, now suppose any one had thought one of these Cards in any one of these heaps, it is easy to find which of the Cards it is; and it is done thus, ask him in which of the heaps it is, which place in the middle of the other two, then throw down the Cards by 1 and 1 into 3 several heaps, in rank wise until all be cast down, then ask him in which of the ranks his Card is, which heap place in the Middle of the other two heaps

heaps always, and this do 4 times at least, so in putting the Cards altogether, look upon the Card, or let their back be towards you, and throw out the 8 Card; for that was the Card thought upon without fail.

Of the Ass, and mule.

IT happened that the *Mule*, and the *Ass*, upon a day, making a Voyage, each of them carryed a Barrel full of Wine; now the lazy *Ass* feeling her self over-laden, complained and bowed under her burden, which the *Mule* seeing, said unto her, being angry (for it was in the time that Beasts spake) thou great *Ass* wherefore complainest thou, if I had but only one measure of that which thou carryest, I should be loaden twice as much as thou art; and if I should give a measure of my Loading to thee, yet my burthen would be as much as thine. Now how many measures did each of them carry? Answer, The *Mule* did carry seven measures, and the *Ass* five measures, for if the *Mule* had one measure of the *Asses* loading; then the *Mule* would have 8 measures, which is double to 4, and giving one to the *Ass*, each of them would have equal burthens, to wit, 6 measures a piece.

To know if there be any water in Wine or not.

TAke raw pears, pare them and make them clean and cut them in the middle: or else take Mulberries, and cast them into the Wine, and if they swim upon the Wine, it is pure and clean without water, but if they sink to the Bottom, there is water mixt with wine.

To make round Balls to take out spots of Oyl or Grease.

TAke purging Sope or soft Sope, and incorporate it with the ashes of Vines finely sifted, as much of the one as the other, then put among the said Powder, Roch Allum burned, and the dry Lees of Wine called Tartar, well beaten into powder; incorporate all well together, and make them of little round apples or Balls, and then it is fit for use.

To make a Water that taketh off the Colouring of the hands of any Artificer, as Dyers, &c.

TAke the Juice of a Lemmon, with a little bay Salt, and wash your hands with it, and let them dry of themselves; wash them again, and you shall find al the Spots and Stains gone: it is also very good against the Scurf or Scabs.

To make Glew or past that holdeth as fast as a Nail.

TAke Pix *Græca*, and tosm, and the powder or burned Brick, which is called Ceruse, and mingle all together and beat it, when you will use it, and when it is cold, it will hold fast as a Nail.

To make a bait to catch wild Geese, and Ducks and all other sort of Fowl.

TAke the Seed of Belenge, and the Roots also, and steep them in Water, the space of a day and a night with the Seeds, then seeth the said thing with the water they were steeped in, so that the Seeds may well drink and soke up the said Water, then lay the said Seed or Grain in the place; where they are wont to frequent, and they will eat this Grain or Seed thus prepared, and thereupon sleep as they were drunk; so that you may take them with your hands; this may also seem to take all manner of Fowl, being cast in the place they usually frequent: If you would bring them to their senses again, give them to drink Oyl Olive, and they will revive again.

To prevent fleas from Dogs.

TAke the Green outward shell of Walnuts and stamp them, and anoint the Dog with it, where the fleas vex him, and especially in the Ears, and the fleas shall not touch him.

To heal Cleft, or Kibed heels.

TAke Dragaul, and Galbanum, as much of one as the other, and make thereof a powder, then take new Wax, Oyl of Violets, and a little Goat suet or Ox-Tallow, and melt it on the fire, then put in the said Powders, and make of all these an Ointment, wherewith anoint your heels, and they will be suddenly whole.

FINIS.