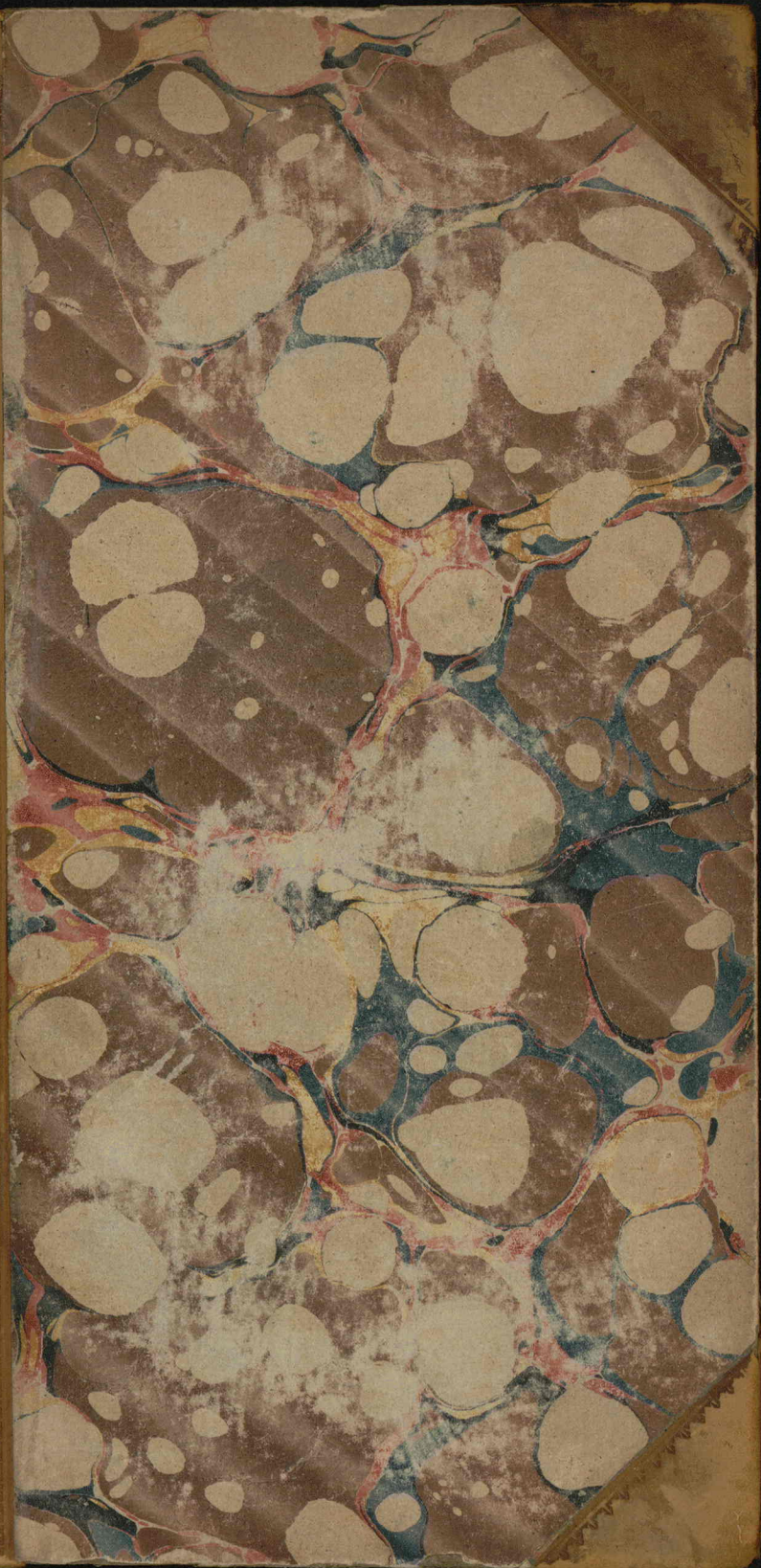




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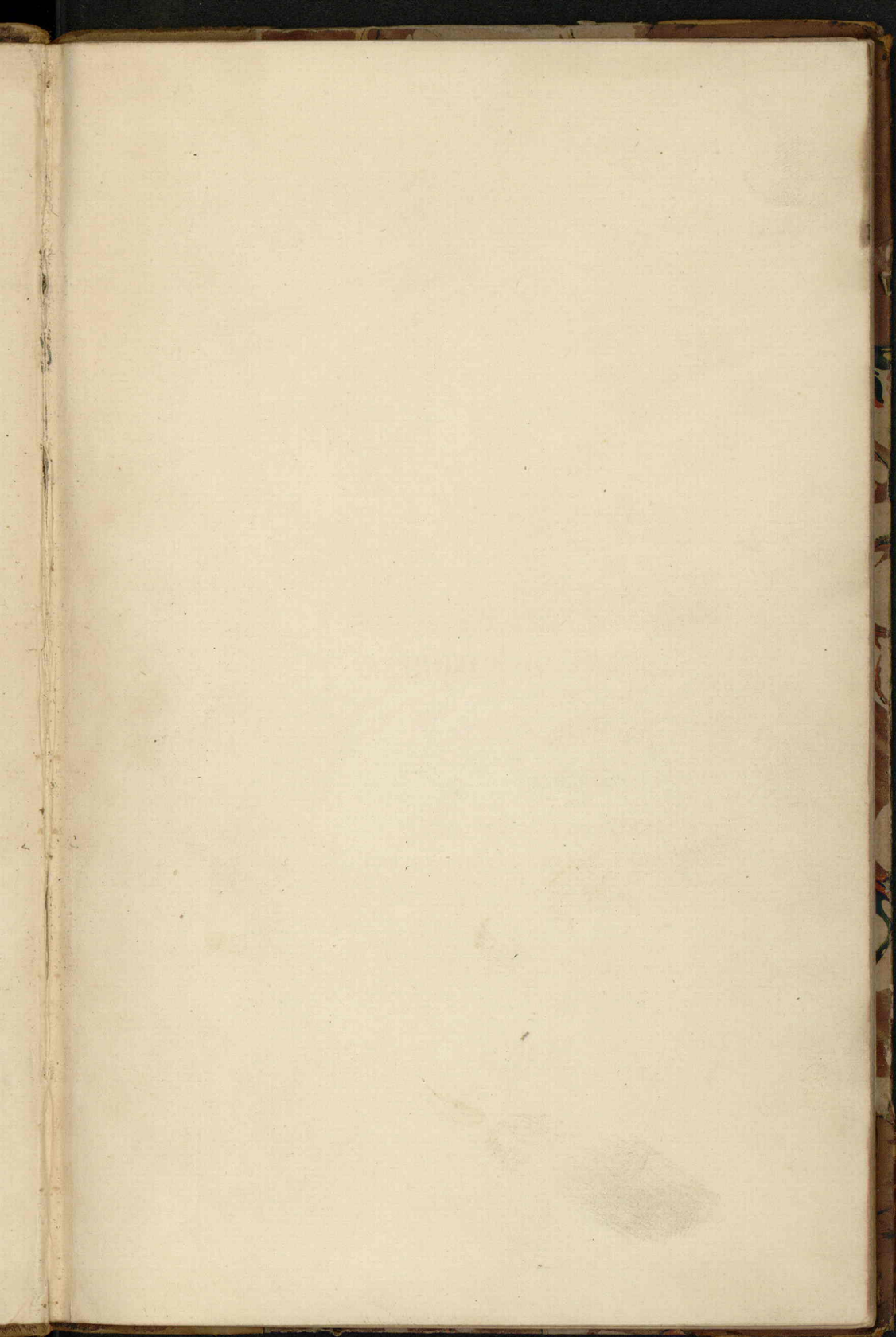
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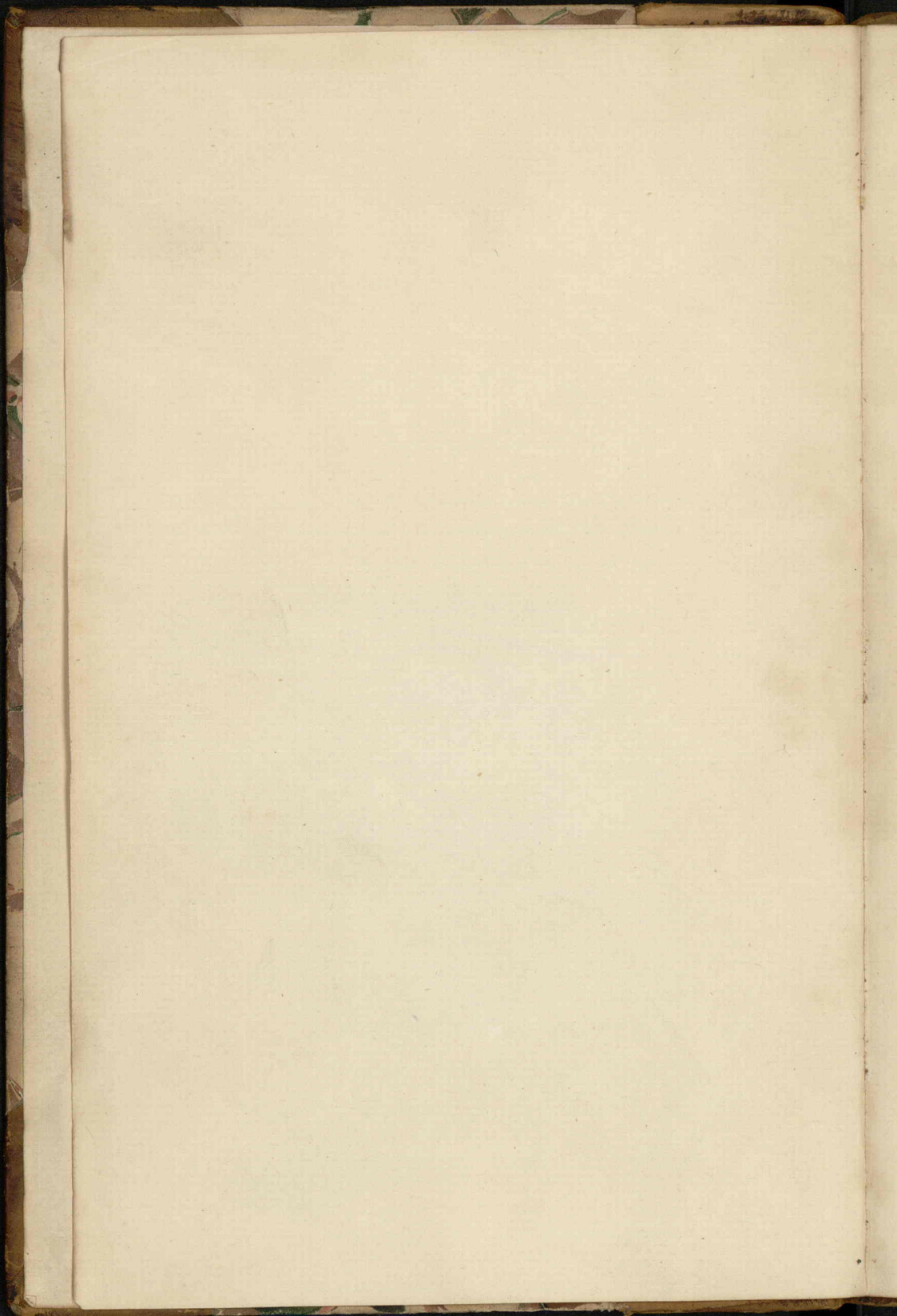
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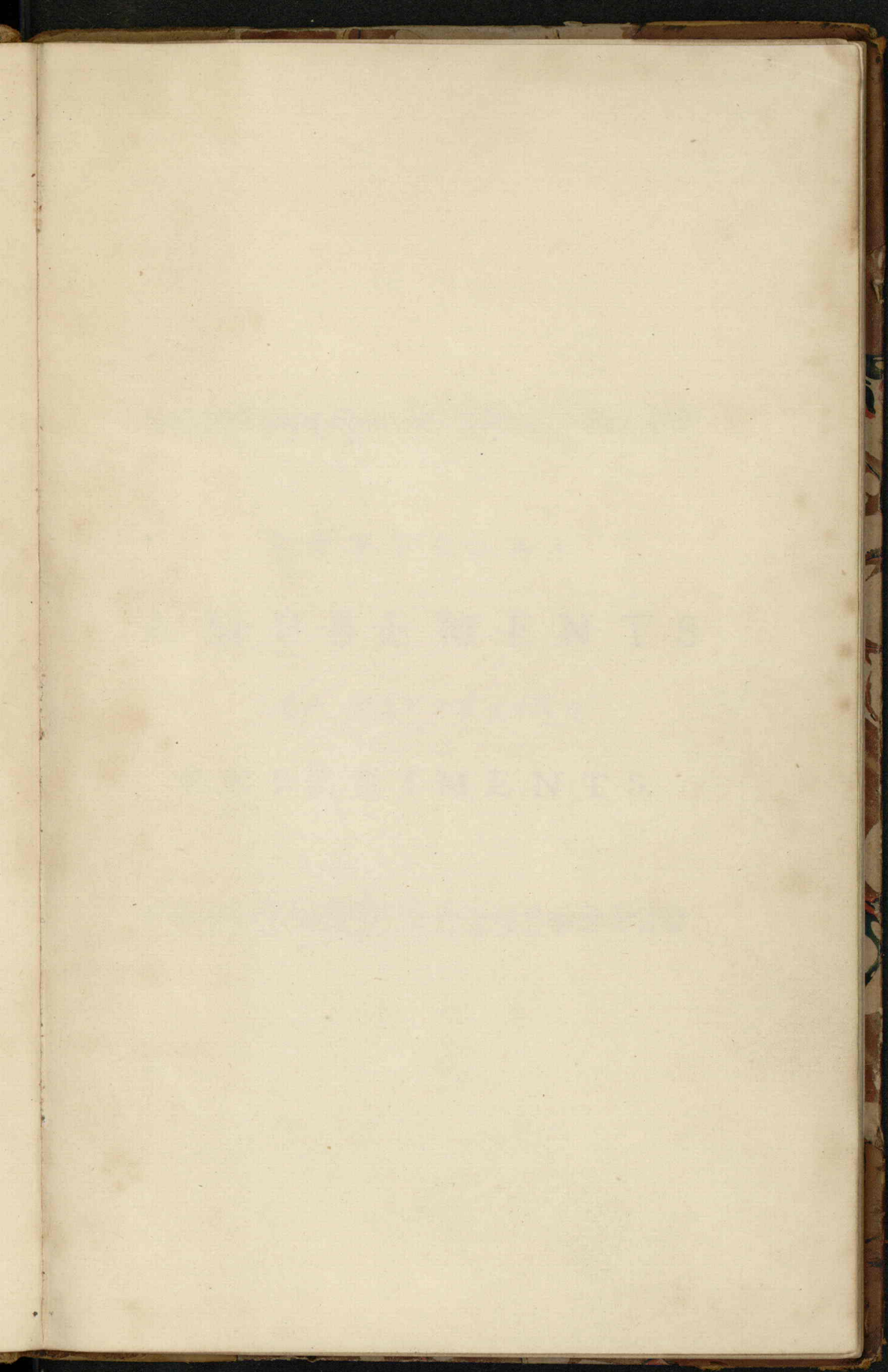
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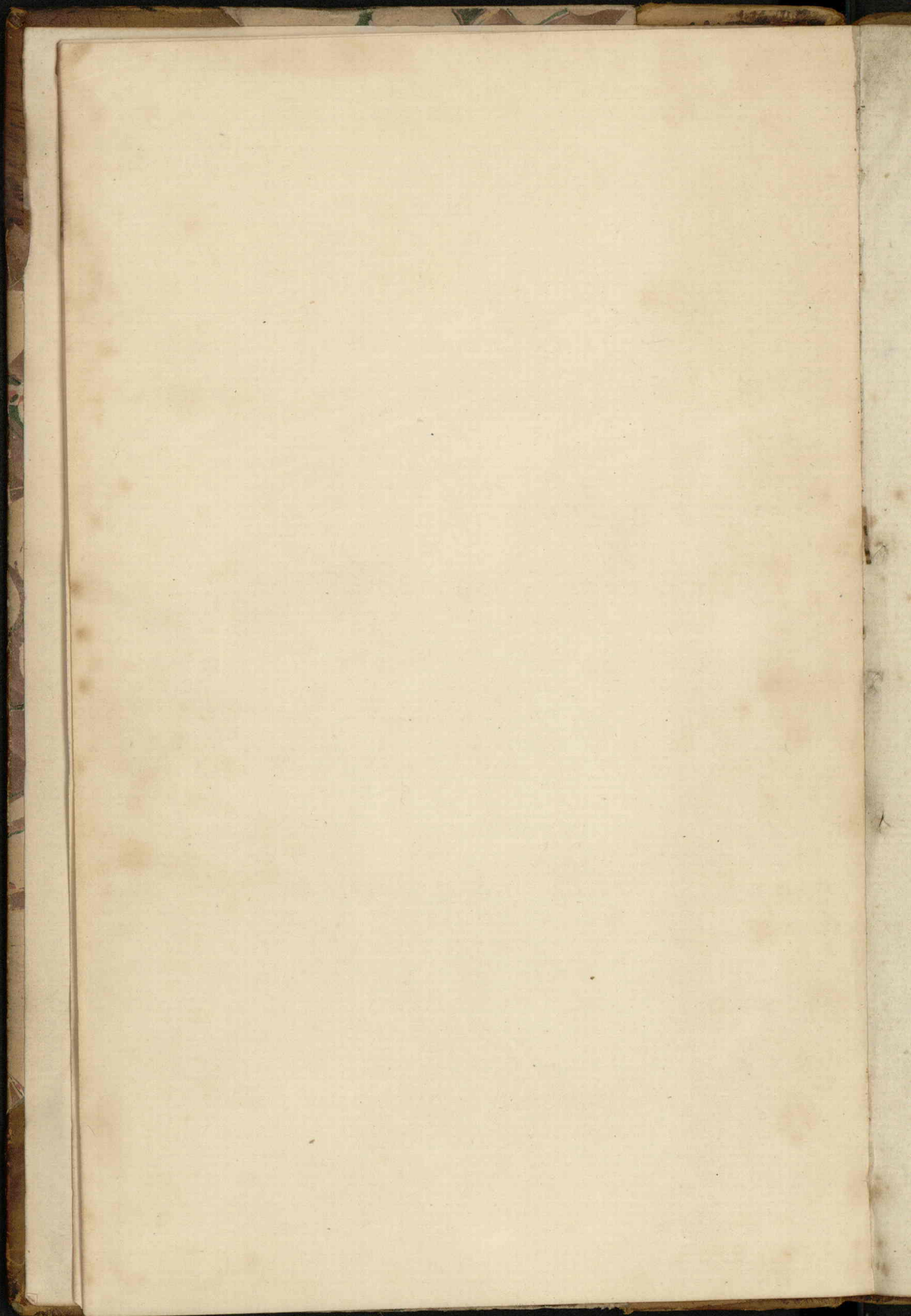
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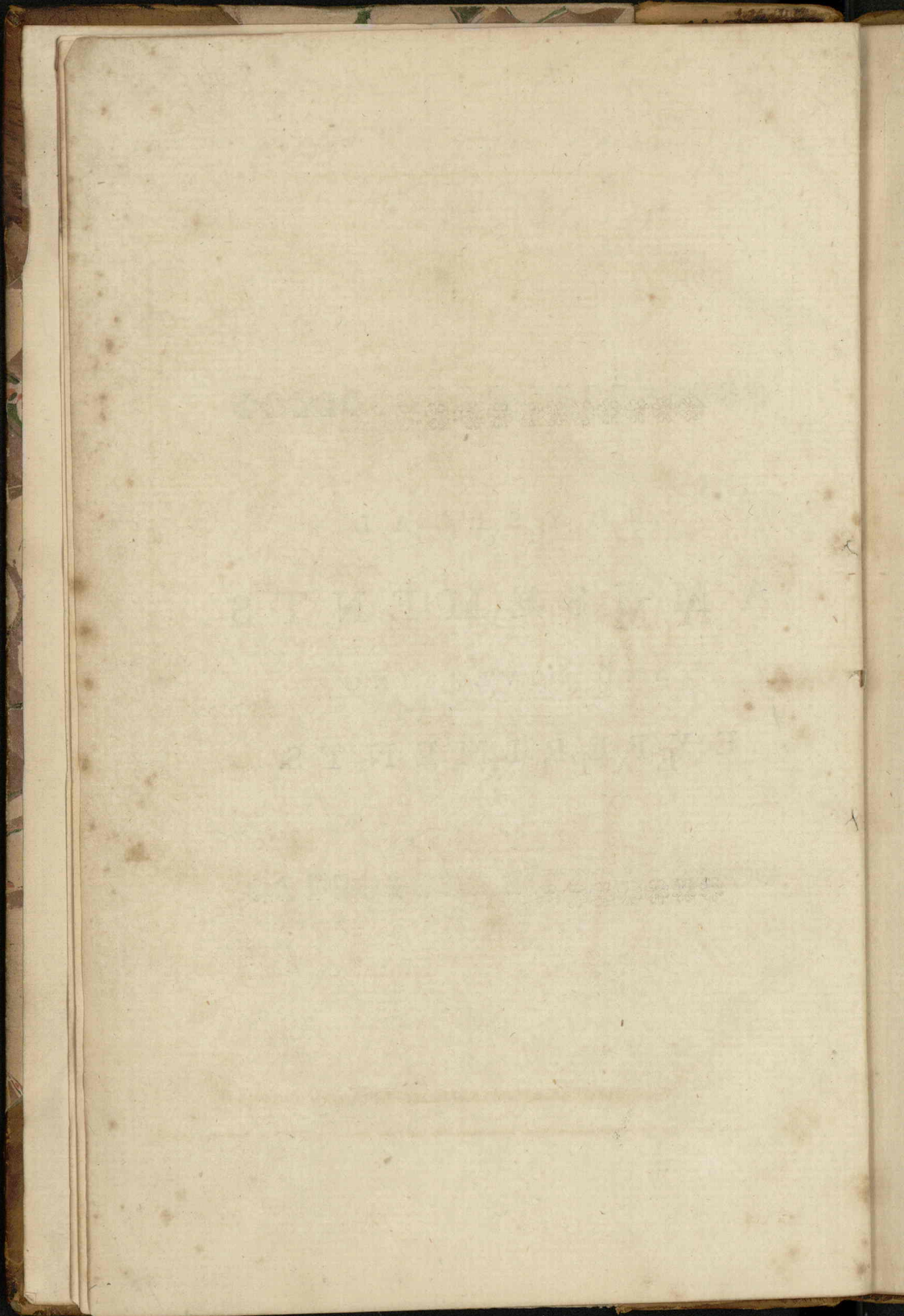


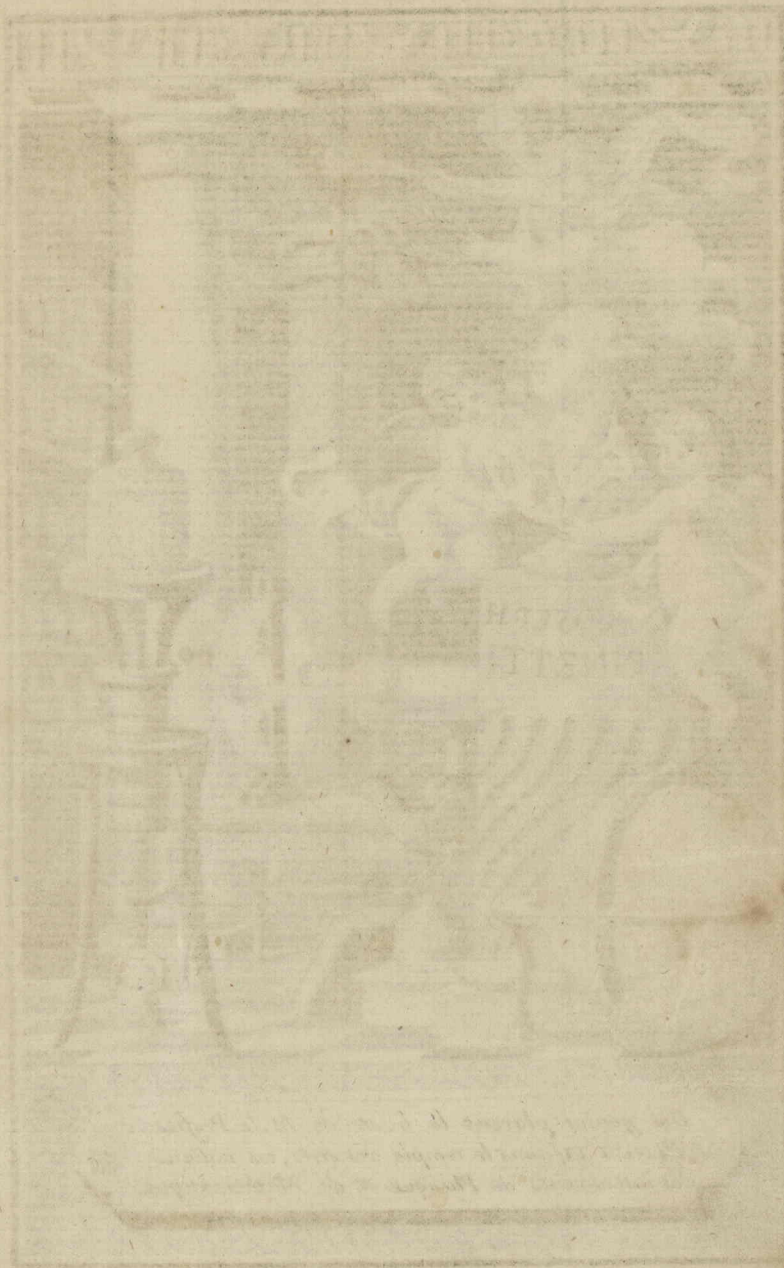


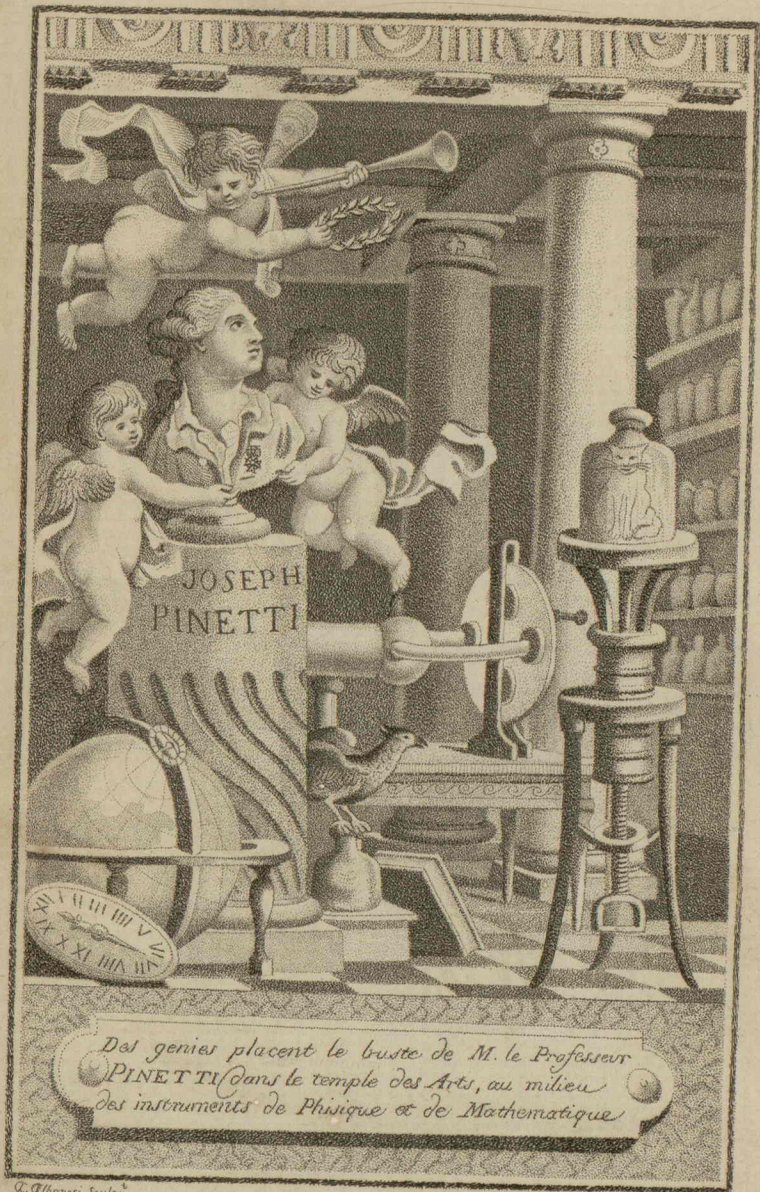


PHYSICAL
AMUSEMENTS
AND DIVERTING
EXPERIMENTS.







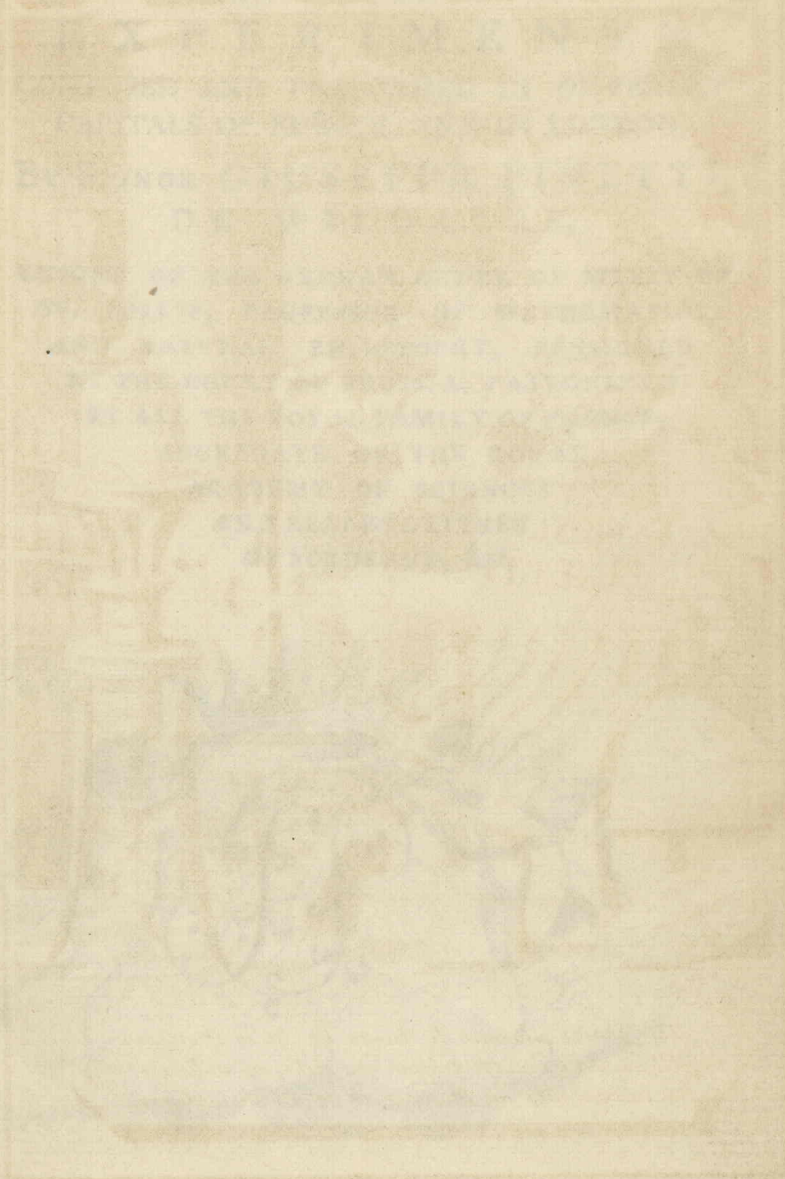


Des genies placent le buste de M. le Professeur
PINETTI dans le temple des Arts, au milieu
des instruments de Physique et de Mathematique

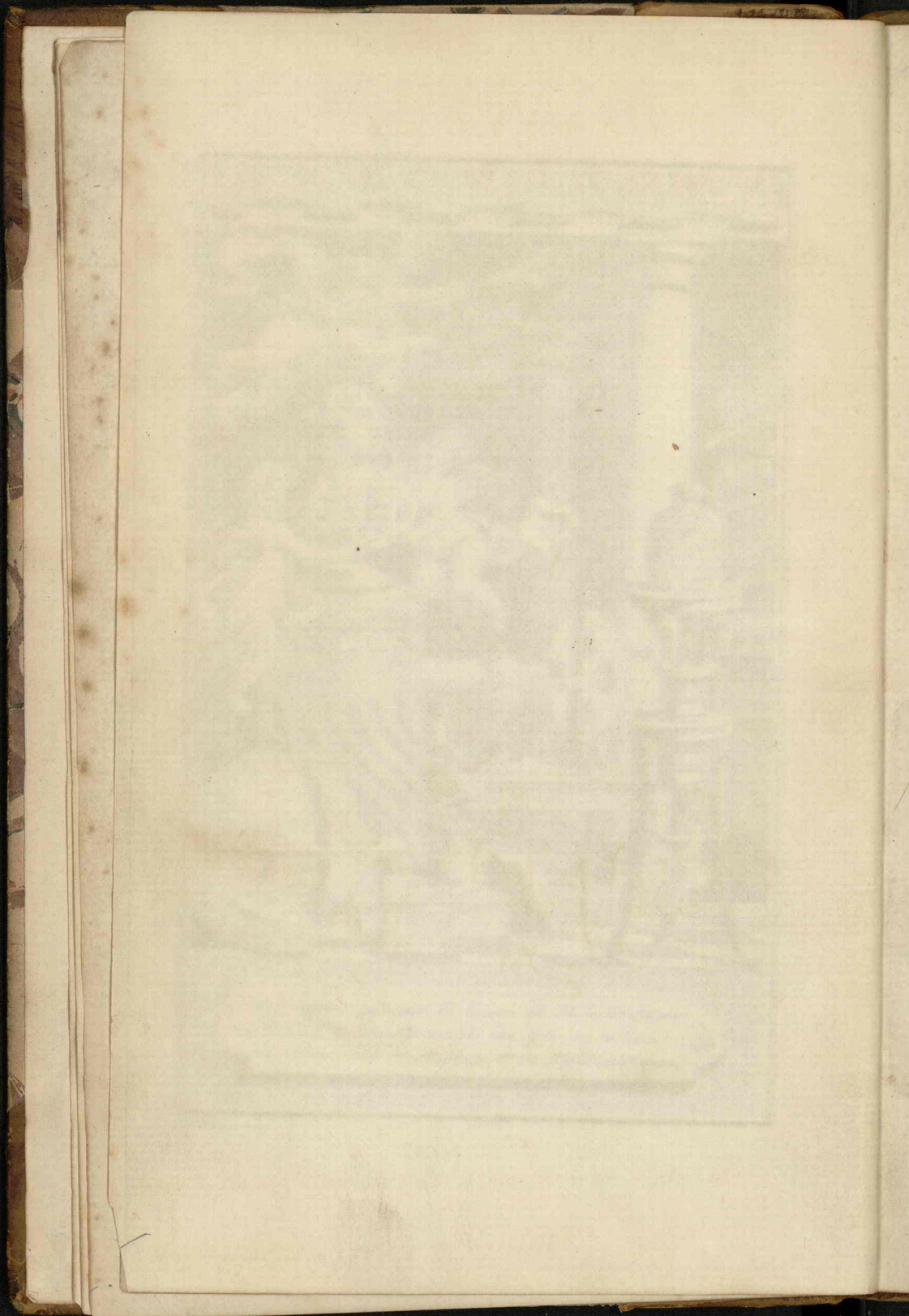
A. Altanosi Sculp.

P R I N T E D

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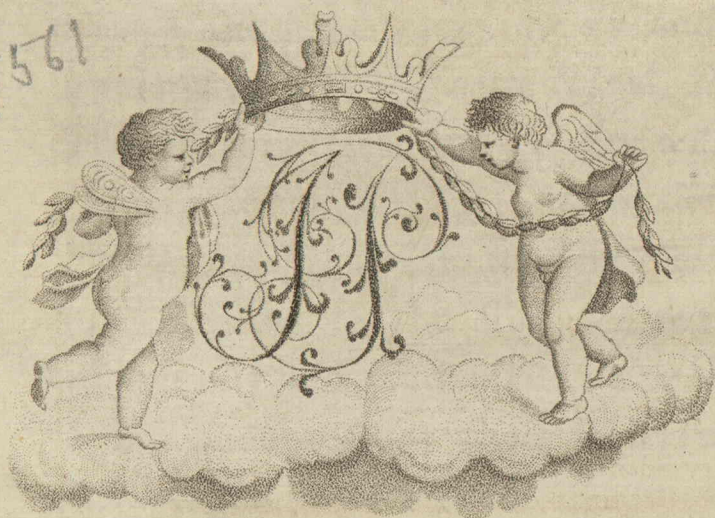


P H Y S I C A L
A M U S E M E N T S
A N D D I V E R T I N G
E X P E R I M E N T S .

COMPOSED AND PERFORMED IN DIFFERENT
CAPITALS OF EUROPE, AND IN LONDON.

By SIGNOR GIUSEPPE PINETTI, S
DE WILDALLE,

KNIGHT OF THE GERMAN ORDER OF MERIT OF
ST. PHILIP, PROFESSOR OF MATHEMATICS
AND NATURAL PHILOSOPHY, PENSIONED
BY THE COURT OF PRUSSIA, PATRONIZED
BY ALL THE ROYAL FAMILY OF FRANCE,
AGGREGATE OF THE ROYAL
ACADEMY OF SCIENCES
AND BELLES LETTRES
OF BORDEAUX, &c.



L O N D O N :
PRINTED IN THE YEAR M D C C L X X X I V .

GRV1547
P65
A M U B M M N I S S

AND OF A BRIDGE
A T T E M P T
COMPOSED AND DRAWN AND DESCRIBED
BY THE
DE WILHELM

KNIGHT OF THE GREAT ORDER OF MERIT OF
ST. LUKAS, PROFESSOR OF MATHEMATICS
AND NATURAL PHILOSOPHY, MEMBER
OF THE COURT OF IMPERIAL PATENTING
BY AUTHORITY OF THE
ACADEMY OF SCIENCES
AND

L O N D O N
PRINTED IN THE YEAR M DCCC LXXIV

M. N. June 21 1705



P R E F A C E.

THE honour of performing several physical amusements before their Britannic Majesties and the Royal Family, was an event that flattered my ambition in the highest degree. To obtain their suffrages, and those of that part of this enlightened nation, before which I have repeated the same experiments and amusements at the Theatre Royal, Hay-Market, was the summit of my wishes. Having obtained these two desirable ends, I blessed the moments I had devoted to the study of natural philosophy and mathematics; to them I am indebted for these inestimable advantages.

B

Some

Some invidious hints insinuated relative to the means I practised for performing these several experiments came to trouble the happiness I enjoyed. The opportunities I had of demonstrating publicly the simplicity and fairness of the execution of my experiments, which had appeared complicated to such a degree as to require a confederate, have put me in the happy way of destroying those unfavourable impressions, and of undeceiving those persons who honoured me with their presence; their repeated applauses have been a very flattering testimony of their approbation of my endeavours to amuse the public.

Several persons of the first rank having signified their wishes that I would

would publish some few easy means of amusing a company, whether in town or in the country; I could not refuse to comply with their desire: this is the motive of this little publication. Being near my departure for France, I shall trace hastily a few experiments, which will be as simple as they are entertaining, and easy to be performed. If amongst them there should be found, by chance, some that are known, or even printed, I hope it will not be taken amiss, nor I shall be looked upon as a plagiarist. Unacquainted with this town, I cannot be informed of all that exists in print: besides, as in this age the study of natural philosophy is so universal, it cannot be in the least astonishing if some of the experiments resulting from that science

were already known. Therefore I claim by anticipation the indulgence of those who read this work. My only wish is to be so happy as to unite in this book the clearness and precision necessary to enable my readers to perform what is contained in each chapter. My project on my return to this metropolis, is to endeavour to obtain again the suffrages of the nation, by performing some new experiments. To reveal on this occasion those which I have performed till now, would be hurtful to my fortune: besides, most of them require a great deal of mechanism and great preparations. Others depend on much dexterity and subtilty; which are out of my power to give, and out of a possibility to be communicated in writing.

If

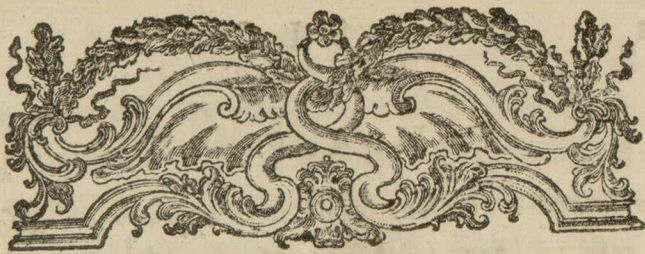
P R E F A C E. 9

If this feeble Effay, which I have the honour of presenting to the public, is favourably received, I promise on my return, and after I have merited their favour, to publish the means I have used to execute all I have performed.

P. L. T. R. A. C. T.

In the table which I have
the account of the
it is favourable
On my return and after I have
used their favour to publish the
means I have used to secure all

have published



PHYSICAL AMUSEMENTS
AND
DIVERTING EXPERIMENTS.

CHAP. I.

Curious Method of restoring to Life, in two Minutes, a Fly that has been drowned even twenty-four Hours.

THIS wonderful experiment, like many others, is produced by a very simple cause. Take a fly, put it in a glass or cup full of water; cover it so as to deprive the fly of air; when you perceive it to be quite motionless, you may take it out and put it on a place exposed to the sun, and cover it with salt: in two minutes it will revive and fly away.

C H A P. II.

To make a Colour that will appear or disappear by Means of the Air.

TAKE a smelling-bottle; put in it some alkali volatile, in which you have dissolved some copper filings; this will produce a blue colour. Present then the smelling-bottle to one of the company, desiring him to stop it; and, to their great astonishment, the colour will disappear as soon as the smelling-bottle is stopped: you will make it easily re-appear by taking off the cork, which will be not less surprising.

C H A P. III.

A Method of drawing a deformed Figure, which will appear well proportioned from a certain Point of View.

DRAW any thing you may fancy on a thin white pasteboard; then prick it; afterwards put the same on an horizontal surface,

surface, which we will suppose to be another pasteboard. Put a lighted candle behind that drawing, and draw on the horizontal surface the lines given by the light: this will give a deformed design. This being done, take away the drawing that was pricked and the candle; then place your eye where the light was, and you will see your drawing assume a regular form.

C H A P IV.

To change the Colour of a Rose.

Nothing more is wanting to change the colour of a rose, whether it is on its stalk or not, but to burn some sulphur under it; which will make it turn white, and it will not regain its primitive colour in less than two hours.

C H A P.

C H A P. V.

*To render hideous the Faces of all the
Company.*

Diffolve some salt and saffron in some spirits of wine; dip a little tow in it and set fire to it. At this light, those who are of a fair complexion will appear green, and the red of the lips and cheeks turn to a deep olive colour.

C H A P. VI.

*Method of Engraving in Relief on the Shell
of a new-laid Egg.*

CHUSE an egg that has a thick shell; wash it well in fresh water; then dry it very carefully with a linen cloth; this being done, put some tallow or fat in a silver spoon; then hold it on the fire; when the fat is melted and very hot, it will serve instead of ink for drawing with a new pen whatever
you

you like. This being finished, you are to take the egg by the two ends between two fingers, and then lay it gently in a tumbler filled with good white wine vinegar; wherein, after remaining for three hours and an half, the acid of the vinegar will have eaten enough of the thickness of the shell; and as it cannot have the same effect on those places that are covered with the fat, all the drawing will have preserved its thickness, and will form the relief that is wanted, the operation sought for.

By this means one may draw on an egg a coat of arms, a mosaic piece, medallion, or any other design whatever.

C H A P. VII.

How to shoot a Swallow flying, with a Gun loaded with Powder, as usual; and after, to find Means to bring it to life again.

LOAD your gun with the usual charge of powder, but instead of shot put half a charge of quicksilver; prime and shoot: if
your

your piece bears ever so little near the bird, as it is not necessary to touch it, the swallow will find itself stunned and benumbed to such a degree, as to fall to the ground in a fit. As it will regain its senses in a few minutes, you may make use of the time by saying, that you are going to bring it to life again; this will astonish greatly the company; the ladies will no doubt interest themselves in favour of the bird, and intercede for its liberty: sympathizing with their feelings for the little prisoner, may be the means of some of them sympathizing with yours.

C H A P. VIII.

To make a Calve's Head bellow as if alive, when dressed and served up.

THIS is effected by a simple and innocent stratagem; it consists in what follows: take a frog that is alive, and put it at the farther end of the calve's head, under the tongue, which you will let fall
over

over it; taking care not to put the frog there till the calve's head is going to be served up.

The heat of the tongue will make the frog croak; which sound, coming from the hollow part of the head, will imitate the bellowing of a calf as if it were alive.

C H A P. IX.

A puzzling Question to be proposed for Solution.

SET down three sums on paper; and say to the company, ladies and gentlemen, there are three sums, very different from each other, and very disproportionate; yet I wish to divide them among three persons, so that they may have an equal sum each, and yet without altering any thing in either of the sums. This will appear very difficult, yet nothing so simple and easy; one single addition will suffice to prove to you that the amount of each sum will be the

the same, and that the shares will not enrich much the respective persons: here is the proof:

E X A M P L E.

5134122

61254

7218

O P E R A T I O N .

Cast up the first of these sums in the following manner, and say, 5 and 1 make 6; 3 more, 9; 4 more, 13; 1 more, 14; 2 more, 16; and 2 more, 18: set down - 18

Make the addition of the second sum in the same manner as you have done the first, and you will find the same sum of - 18

Then proceed for the third as in the two preceding, and the product will be also - 18

Here then is my division made, and each person will have only 18, as I have proved by the foregoing example.

By

By this we see, that nothing more is required than to be attentive in setting the fums, to make the numbers so that each fum may amount only to 18.

You may make the same question on whatever fum you please, only observing, as above, that the amount of the numbers you set may not exceed the fum you desire to belong to each person that is to have a share.

C H A P. X.

How to dispose two little Figures, so that one shall light a Candle, and the other put it out.

TAKE two little figures of wood or clay, or any other materials you please, only taking care that there is a little hole at the mouth of each. Put in the mouth of one a few grains of bruised gunpowder, and a little bit of phosphorus in the mouth of the other; taking care that these preparations are made before hand.

Then

Then take a lighted wax candle and present it to the mouth of the figure with the gunpowder, which taking fire will put the candle out: then present your candle, having the snuff still hot, to the other figure; it will light again immediately, by means of the phosphorus.

You may propose the same effect to be produced by two figures drawn on a wall with a pencil or coal, by applying, with a little starch or wafer, a few grains of bruised gunpowder to the mouth of one, and a bit of phosphorus to the mouth of the other.

C H A P. XI.

A curious Secret to make a Card pass from one Hand into the other.

TAKE two deuces, the one of spades, the other of hearts; then put on that of spades the marks of hearts, and on that of hearts, those of spades; which you will do

do easily, by splitting a card of each colour, which you are to cut out with dexterity, in order that the mark may be very neat: then rub lightly on the back of the spades and hearts that you have cut, a little soap, or very white pomatum; then put the mark of hearts on the ace of spades, and the mark of spades on the ace of hearts; taking care to cover them quite hermetically, and to make all your preparations before you begin your experiments.

Divide your pack of cards in two parcels, and under each parcel you must put one of your two aces thus prepared; afterwards, take with your right hand the parcel under which is the ace of hearts, and with your left that where the ace of spades.

You will then shew to the company that the ace of hearts is on the right hand, and the ace of spades on the left; when every body is convinced of it, you are to say, ladies and gentlemen, I am going to command the ace of hearts, which is in my right hand, to pass to my left, and

C

the

the ace of spades to take its place; you may even propose to have both your arms tied, to prevent their joining and communicating.

All the secret consists only in making a movement and stamping of your foot, when you give your command: during this movement and stamping of your foot, you must slip with dexterity your little finger on each of the marks, in order to rub off and make the marks of spades and hearts, that were sticking on the two cards by the means explained before, fall, without any body perceiving it; then you will shew to the company that the cards have obeyed your command, by passing from the left to the right, and from the right to the left, without your hands communicating.

This trick, done with dexterity and subtilty, will appear very singular, although it is very simple.

CHAP.

C H A P. XII.

To change a Card which is in the Hand of a Person, recommending him to cover it well.

CUT out a three of spades very neatly; then, the card being cut through, take an ace of diamonds, which you are to place under your three of spades that was cast out, taking care that your ace of diamonds is perfectly covered by the spades, which is found in the middle of the three that is cut out: and then you must pour lightly on that card some jet powder,*

* *Method of preparing jet powder.*

Pound in a copper mortar your jet, which must have been bruised a little with a hammer; when it is well pounded, it must be sifted through a sieve, and also through a piece of muslin. Keep that powder, which cannot be too fine, in a little box, to use it when occasion may require: take a pinch of it either with your fingers or with a piece of paper; then scatter it on the card, and it will stick only in those places that have been touched by the roll of pomatum, and may be taken off very easily by the rubbing against the carpet, when you will push the hand of the person who covers the card, without the card being soiled in the least by it.

which will easily stick on the places rubbed with pomatum, and by that means will form a three of spades on the card that was before an ace of diamonds. Take in your hand an ace of diamonds, behind which you must put a three of spades, turned the contrary way.

The Person who has in his hand the three of spades that is prepared, will shew the card to all the company; you will shew in your turn the ace of diamonds that you have in yours, and then tell that person to lay his card downwards on the carpet that covers the table; make him lay his hand on the card, and ask him whether he is very certain that it is a three of spades he has under his hand. On his affirmative, you may rally him on it, and tell him, at the same time that you push his hand which is over the card, that he is mistaken, and that it is an ace of diamonds he holds. The movement you will cause him to make while you push his hand, under which the card is, will make the jet powder, that formed the three of spades over the ace of diamonds, remain on the carpet, and he will be extremely astonished to find really an ace of diamonds, whilst

whilst you, who make the trick, by turning your hand where the three of spades and the ace of diamonds are, back to back, will shew, the three of spades, and make the company believe that you have conveyed it from the person who held the same without his perceiving it.

This trick must be done dexterously and quickly, in order that the little deception be not discovered. Practice is the greatest master.

C H A P. XIII.

How to guess a Card that has been thought of by any body, by writing before hand on a Paper or Card a Number, which will certainly be that of the Card that has been thought of.

ALL the preparation of this trick consists in a mathematical combination; here follows the method of operating in order to succeed.

Take a pack of piquet cards, present them to one of the company, desiring him to shuffle them well, and to get them shuffled by whoever he pleases: then make several persons cut them. After which you will propose to one of the company to take the pack, and think of a card, and remember it, as likewise of the number of its order in the pack, by counting one, two, three, four, &c. till he comes inclusively to the card thought of by him. Then offer to go in another room while he is doing what you required, or to be blind-folded, assuring the company that you will declare before-hand, if required, the number of the order in which the card is that has been thought of.

E X A M P L E.

In the supposition that the person who thinks of the card will stop at number 13, and that thirteenth card is the queen of hearts.

Supposing again that the number you have marked or designed before-hand is number 24; you will return in the room in case you had left it, or desire the handkerchief, to be taken

taken off, if you have been blind-folded; and, without asking any question of the person who has thought of the card, ask only for the pack, and apply it to your nose as if to smell it; then passing it behind your back, or under the table, you must take, beginning from the bottom of the pack, twenty-three cards, that is to say, one less than the number you had designed before hand; then place those twenty-three cards on the top of the remainder; you must take particular care not to put one more or less, for that would prevent your success. This being done, you are to return the pack to the person who has thought of the card, recommending him to reckon the cards from the top of the pack, beginning by the number of the card he thought of. His card being the thirteenth, he will be obliged to count fourteen, and you are to stop him when he comes to twenty three, telling him that the number you have designed is twenty-four, and that consequently the twenty-fourth card which he is going to take up will be the queen of hearts, and it will be exactly the case.

C H A P. XIV.

A mathematical Combination for guessing, in a whole pack composed of fifty-two Cards, how many Points will make the Cards under each Parcel, which Parcels are to be made by one of the Company, observing to him that each Parcel he makes is to compose the Number of Thirteen, to begin from the Point of the first Card which he takes to form each Parcel.

E X A M P L E.

THE pack having been shuffled by one or more persons, make it be cut by as many persons as you think proper.

Then desire one of the company to form the parcels of cards, all which must contain thirteen each, beginning by the first card he takes up,

Suppose that this first card is a nine, the next will be called ten, and so on till thirteen ;

teen; consequently this first parcel will be composed of five cards - - - - - 5

If the next card should be an ace, the ace counting only one, the next parcel will therefore be composed of thirteen cards - - - - - 13

Suppose the next card is a court card, or a ten, they being of the same value, this parcel will contain, in order to make up thirteen, four cards - - - 4

If the following should be a five, then the fourth parcel will contain nine cards - - - - - 9

Should the next parcel be a seven, the fifth parcel will be composed of seven cards - - - - - 7

A court card being the first of this parcel, it will be composed of four cards 4

If the seventh begins by an eight, it will be composed of six cards - - 6

In that case the eighth cannot be made, except it begins by a ten, or a court card, since there remains only four cards to employ the whole number of the cards, which is fifty two - - - 4

Sum total - - - - - 52

In the supposition then that this eighth parcel begins by a ten, or court card, which is the same, there would remain no cards, and you would have eight parcels.

If it began by any other card, not adapted to make out thirteen, there would remain four cards, which must be spread on the table, without discovering them.

In order to find out the number of points contained under each of the parcels, whether they be to the amount of eight, or only seven, and four cards remaining, you must make use of the following method;

Without touching the cards, separate in your mind four parcels; then multiply silently by 14 the remaining parcels, whether they are four or only three.

In the first case you are to say in your mind, 4 times 14 are 56; then add to this number one point for each of the parcels that you have separated in your mind, which will make 60. Then make the eight parcels be
turned

turned up, and count the number of points contained in each of the cards that are under, you will then find 60, observing that the aces count only for one point, and the court cards for 10.

If there should be only 7 parcels, you will have 4 cards remaining; you will however separate 4 in your mind; then you are to multiply the 3 remaining parcels by 14; and say to yourself, 3 times 14 is 42, and 4 for the 4 parcels that you separated, make 46; to which you must add 4 more for the 4 cards that will remain, which will make 50. On turning up the 7 parcels you will necessarily find 50.

If by chance each parcel should begin by an ace, which is possible, you could then make only 4 parcels, and as it must be the 4 aces, that would be found under, you would only have 4 points.

If it happened also, that three parcels began each by an ace, it would then take up 39 cards; it is probable that in such a case there
would

would be only four parcels in all, and a few cards remaining: you must then content yourself with counting as many points as parcels; to which you will add one point for each of the remaining cards, and this will amount infallibly to the just number of the points of the cards under the four parcels.

C H A P. XV.

To guess the Thoughts of any Person, assuring him, that you will write before-hand on a piece of Paper the Amount of the Parcel of Cards he shall happen to chuse out of the two placed on the Table.

TAKE some cards, divide them into two parcels, taking care that in one there are only two or three sevens, and in the other seven court cards; call for a pen and ink, and write on a bit of paper the sevens; then turn the bit of paper down, that what you have written may not be seen; then tell the person to
make

make his choice. Let him chuse whatever he pleases, your number will be good, since if he should chuse the greatest parcel, you may shew him your paper on which is written the sevens; then desire him to count the number of cards contained in the parcel he has chosen, and he will find it to be seven, as you had guessed. This will appear astonishing to him and to the company: but they will easily recover from their surprise when, on raising the other parcel, you will shew that it contains only sevens, and consequently whatever parcel he had chosen, your number, which you had set down was good, since one parcel contained seven cards, and the other nothing but sevens.

This trick must not be done twice before the same company, for then it would become tiresome.

But generally whenever you do a trick before a company, you must never begin it again before the same.

C H A P. XVI.

A curious and agreeable Wager, which you are sure of winning.

ADdress some person in the company, and say, Madam, or Sir, have you a watch, a ring, an etwee, or any other trinket? Begin by examining what has been given you, in order to form an idea of its value, since you are to lay your bet considerably under the intrinsic value of the trinket, to avoid being duped.

Suppose what has been offered to you is a watch, you are to propose a guinea as a wager against it; saying to the lady or gentleman, I lay a guinea that you do not say three times, my watch: when it is put on the table, and your wager is accepted, ask the person, presenting him his watch, what is that? he will not fail to answer, it is my watch.

Present him afterwards another object, making him the same question: suppose the
object

object you present to be a pen, a piece of paper, or any other thing. If the person names the object you present, he has lost; if, on the contrary, he is on his guard, and answers, my watch, you must then say, Sir, I see very well I have lost; for if you say once more, my watch, you must certainly win; but if I lose, what will you give me? the person, being always on his guard, will answer again, my watch: then, appealing to his own words, you will take the watch and leave him the stake.

C H A P. XVII.

A trick with cards; uniting the double Advantage of being very easy and infallible, it being on a little numerical Combination.

DEfire some person in the company to chuse, at his will, three cards out of a piquet pack, observing to him, that the ace is to be counted for 11 points, the court cards 10, and the other cards according to the points they mark.

When

When he has made his choice, desire him to lay on the table his three cards separately, and to put upon each parcel as many cards as wanting to make up 15 points; that is to say, if the first card should be a nine, there must be added six cards over; if the second a ten, five cards; and if the third a knave, five cards likewise; this will make nineteen cards employed; consequently there will remain thirteen, which you are to ask for; and pretending to examine them, you must count them in order to be certain of the number that is left; then in your mind add sixteen to the remaining number, and you will have twenty-nine, number of the points that the three chosen cards under the parcels contain.

C A A P. XVIII.

Sympathetic Inks.

THESSE kinds of inks are very curious, and may serve for a great number of physical recreations, very surprising to such as
are

are not acquainted with the manner of preparing them.

One kind, very easy, is made by taking an ounce of common aqua fortis, which you are to mix with three ounces of common water; you will use this mixture to write on paper that is strong and very stiff: this writing becomes totally invisible in drying; and in order to make it reappear, you need only wet the paper; and when it dries the writing disappears again. This effect may be repeated two or three times.

This process is the easiest to be done, as the necessary ingredients are almost always at hand.

Many other things furnish the means of making sympathetic ink, such as cobalt, bismuth, lime, &c. &c. but they require chemical and difficult preparations to be efficient.

The easiest to be obtained are mentioned before; as the mixture of aqua fortis and common water; and those that may be formed

by dissolutions of salt and acids, such as lemon or onion juice: in order to render them visible, you need only approach them to the fire: the cold air produces on them the contrary effect.

C H A P. XIX.

To make an additon before the Figures are set, by knowing only how many Figures are in each Row; as likewise how many Rows compose the whole; and then adding yourself some Figures equal to those that had been set.

SUPPOSE the person had set five rows of figures, each row containing five figures.

Say in your mind, as you are making the addition beforehand, 9 times 5 make 45; set down 5 and carry 4: repeat the same thing for each of the five figures, as if they all counted 9; therefore for the second, say again, 9 times 5 make 45, and 4 carried over make 49; set down 9 and carry 4: in
the

the same manner for the third, say 9 times 5 are 45, and 4 carried over are 49; set down 9 and carry 4: for the fourth do the same; and set down 9 and carry 4: for the fifth repeat the same, by setting down 9 and carrying 4.

Thus your addition being made beforehand will produce the sum of 499995: then shew this addition to every body in the company; and beg some one to do you the favour of laying on a paper 5 rows of numbers, containing five figures in each row.

E X A M P L E.

Suppose the numbers set for you are the following:

29971
14563
76382
37797
80130

You ask leave to add a like quantity of numbers; in doing this, you take care that each of the figures you set down make 9 with each of the figures that have been given for you.

70028
85436
23617
62202
19869

499995

The

The first figure being 2, you must set 7; the second being 9, (which completes the number wanted) you must set a cypher (0); the third being the same, operate as before; the fourth being 7, set down 2; the fifth being 1, set down 8.

The second row beginning by 1, your first figure will be 8; the second number being 4, set down 5; the third being 5, put down 4; the fourth being 6, you must set down 3; the fifth being 3, set down 6.

As the third row begins by 7, begin yours by 2; under the 6 lay 3, then 1 under the 8, and 7 under the 2.

For the fourth row, set 6 under the 3, 2 under the first 7, and another 2 under the other 7; a 0 under the 9, and 2 under the 7, which complete this row.

You are to do the same for the fifth row, putting 1 under the 8, 9 under the 0, 8 under the 1, 6 under the 3, and 9 under the 0.

Then

Then desire some of the company to cast up these ten sums, and it will be found that the product of the whole addition will form the sum of 499995.

In order to come to this combination, you need only fix the number of figures that will compose each row, and determine the number of rows; then to reckon each row for 9, as has been shewn above.

You may likewise present this addition, by saying, that it is the total amount of ten rows, composed of five figures each; out of which five rows will be set by the person who chuses to do it; then multiply secretly as many times 9 as you are to set rows of five figures; therefore multiply 5 times 9 by 5, which will give you the sum of 499995.

The person having set his numbers, you are to add your five rows, taking care that every number you set will make 9 with that to which it corresponds; which being done, you are to ask any one to cast the whole sum up, and the product will be the same as the sum you set down before-hand.

If it were requisite to employ other numbers instead of that of 9, you should, in order to succeed, warn the persons who chuse to set the figures, to be attentive that their numbers do not exceed that agreed upon.

C H A P. XX.

An artificial Spider, which moves by Electricity.

TAKE a bit of burnt cork, as big as a pea; give it the shape of a spider; make its legs with threads of hemp; put a grain of lead in the cork to give it some weight; then hang this artificial spider by a bit of grey sewing filk (that is not twisted) between two bodies, the one electrified and the other not; or between two bodies endowed with different electricities: it will go and come between these two bodies, and the movement of the legs will be seen as plain as if it were a living spider.

This

This artificial spider, if well made, will astonish those who see it move so naturally.

C H A P. XXI.

To extinguish two Wax Candles, and light two others, distant about three Feet, by the firing of a Pistol, loaded with Powder, as usual.

Nothing is more simple than the operation which produces this supernatural effect.

1st. Get some whole wax candles, and let them be recently snuffed.

2d. You are to put in the middle of the wick of those candles to be lighted, about the size of a millet grain of phosphorus; to do which, divide the wick with a pin or a tooth-pick; then place yourself at five or six feet distance from them, and fire your pistol at the lighted candles, which will be extinguished by the powder, whilst it will make the phosphorus take fire, which will light the other two.

You may likewise light a wax candle, on the wick of which phosphorus has been applied, according to the foregoing method, by means of a sword well heated in a near room. You need only present the point of the sword to the wick of the candle, commanding it to light.

N. B. Observe that you are not to touch the phosphorus with your fingers; but take the point of a knife, or a pair of small pincers. You must take care also, that the wick of the candle is cold before you put the phosphorus to it; without this precaution it would take fire immediately.

C H A P. XXII.

To compose a red Colour, imitating the Colour of Blood.

THIS liquor or fluid furnishes the entertaining means of making known to a company the person who is most addicted to love.

Pre-

Preparation of the Liquor.

Cut in very small chips a piece of Fernambuco wood; put them in a large glass full of good white wine vinegar; add to it a bit of common white allum, of the size of a small nut; make the whole simmer over a gentle fire for half an hour, in a new earthen pot or pipkin; taking care to stir this composition, in order to prevent it from boiling over while on the fire.

When it is taken from the fire, let it cool, and strain it through a piece of linen; then pour it into a bottle of clear glass.

You must make all these preparations before-hand; as these experiments are only agreeable when performed with quickness.

You will find it necessary to provide yourself with a tube of clear glass, about fifteen or eighteen inches long, about the thickness of a wax candle, taking care to have it stopt at one end.

When

When you present yourself before a company, in order to perform this experiment, you are to carry the tube in your pocket, and holding the phial in your hand, you are to say, “ Ladies and gentlemen, here is a
“ phial containing liquid blood ; I hope to
“ make you know by it the person most
“ addicted to love in the company.

“ Please to observe that I pour a little of
“ this liquor in this tube. As you might
“ imagine that this liquor, like that put in
“ thermometers, may rise by dilating itself
“ when exposed to heat, and consequently
“ the pressure of the hand will suffice to
“ produce this effect, and it will condense
“ by rarifying when exposed to cold ; I assure
“ you, ladies and gentlemen, it is not the
“ case ; this liquor differs entirely from that
“ put in thermometers ; and you may easily
“ be convinced of it before I make the ex-
“ periment I promised you. You may put
“ it near the heat of a candle, and even that
“ of a fire, without any degree of heat mak-
“ ing it rise in the least ; but by a peculiar
“ and sympathetic virtue you will see it boil,
when

“ when the tube is touched by a person of
 “ an amorous disposition.”

Then take out of your pocket a little potash, keep it in the interior part of the hand that holds the tube at the top, as if you wanted to keep it shut, and as soon as the person you wish to make pass for the most amorous in the company takes the lowest part of the tube in his hand, you are to let fall dexterously a little of the potash in it, and you will see the liquor boil and rise to the top of the tube, to the great astonishment of the spectators.

C H A P. XXIII.

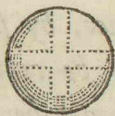
To extinguish a wax Candle at eighty or a hundred Paces distance, by firing a Gun loaded with Ball, and to be certain of not missing, however unskilful may be the Marksman.

THIS experiment may be easily tried in the country, and even in town, in a garden
 that

that is rather large: the best marksman may be challenged, and undoubtedly worsted.

Load a gun with a common charge of powder, and a leaden ball. Your opponent will do the same on his side; then let him fire first, that you may see him miss his aim, as it is very difficult at such a distance to put out a candle.

After having rallied him on his pretended skill, you will fire in your turn, and will extinguish the candle, to the great astonishment of the spectators, who saw you load your gun in the common way with powder and ball, but did not perceive that your ball was pierced through and through in the form of a cross, as is represented by the figure that follows:



The whole magic of this experiment consists in this pierced ball, by which the elasticity of the air that drives it acquires a
divergent

divergent force, by passing through the holes of the ball, and produces this surprising effect.

C H A P. XXIV.

To cut a Glass, a Looking-glass, or even a Piece of Crystal, let it be ever so thick, without the Help of a Diamond, in the same Shape as the Mark of the Drawing made on it with Ink.

THIS remarkable operation unites utility with amusement. For being in the country, or in a place where there is no glazier nor glassman to be had, the following means will answer the purpose without their help.

Take a bit of a walnut-tree, about the thickness of a candle, and cut one of its ends to a point; put that end in the fire, and let it burn till it is quite red. While the stick is burning, draw on the glass or crystal, with ink, the design or outline of the form in

which

which you mean to cut it out. Then take a file or a bit of glass and scratch a little the place where you mean to begin your section; then take the wood red hot from the fire, and lay the point of it about the twentieth part of an inch, or thickness of a guinea, from the marked place; taking care to blow always on that point in order to keep it red; follow the drawing traced on the glass, leaving, as before, about the twentieth part of an inch interval every time that you present your piece of wood, which you must take care to blow often.

After having followed exactly the outlines of your drawing, to separate the two pieces thus cut, you need only pull them up and down, and they will divide.

C H A P XXV.

*To melt a Piece of Steel as if it was Lead,
without requiring a very great Fire.*

TAKE a piece of steel and put it in a crucible; then throw in a handful of antimony

mony in powder : as soon as your crucible begins to be red, your piece of steel will melt like lead.

Pour it afterwards into an earthen vessel, or a wedge-mould, to shew the company your operation has succeeded as you had promised.

Another Method of melting Steel, and to see it liquify.

Make a piece of steel quite red in the fire ; then holding it with a pair of pincers or tongs, take in the other hand a stick of brimstone, and touch the piece of steel with it : immediately after their contact, you will see the steel melt and drop like a liquid.

C H A P. XXVI.

To unite Wax and Water (Things absolutely opposite to each other) ; this Union made in the twentieth Part of a Minute, forms a good Pomatum to clean the Skin, and render it soft and white. It is a fine Cosmetic.

IN order to make this mixture, (useful for many things) put in a glazed earthen pot quite new, six ounces of spring or river water, to two ounces of good white virgin wax ; add to this a good pinch of salt of tartar. If you wish to conceal your operation, nothing is easier : make a little roll or stick of wax, in which you will introduce a pinch of salt of tartar ; put these ingredients on the fire, and when they begin to heat, be attentive to stir them with a little stick, and you will see the union take place as soon as the wax melts ; you will then have it at your option to render the pomatum, by the result of this operation, more or less liquid, by leaving it on the fire more or less time.

C H A P.

C H A P. XXVII.

A curious Method of sealing a Letter, so as not to be opened, by variegating the Seal with different coloured Species of Wax.

SUPPOSE you wish to have your seal of four colours, and that the cartrage of the escutcheon be *yellow* or *or*, as well as the crown; the field of the shield or escutcheon, *red* or *gules*; the seal itself *green* or *synople*, and the supporters, if any, *black* or *sable*.

Take off then as many different impressions of your seal as you have kinds of wax to employ, taking care to make them on a very thin paper; this being done, with a pair of scissars cut out of each impression each of the objects that are to be variegated; that is to say, begin by cutting out the shield or escutcheon; and, by wetting it on the back with the tip of your tongue, place it on your seal over that part it represents; then do the same for the cartrage of the shield, as likewise for the supporters; and when all is well ranged, take the green wax, which is to re-

E

present

present the ground of the seal, and melt it as you usually do to seal a letter; then placing the seal on it that has in the mouldings the different objects which are to vary your seal, each of these objects will be found placed naturally, and will form a seal of four colours.

If any body should attempt to break open the letter by heating the wax, the different colours in melting must mix and discover evidently the infidelity by their confusion.

C H A P. XXVIII.

To make fine blue Wax, which is very difficult to be had.

TAKE an ounce of mountain blue, or blue ashes, an ounce of fine mastic, the fifth of an ounce of true Venice turpentine; then get a small iron pot or pan, well cleaned, and made so as to have a little spout or beak; put the mastic in it first, which is to be melted on the fire, taking care that it does not burn; then mix the turpentine with it: this mixture being done, take the pan from the
fire

fire and put the blue ashes in it; then stir it all well with a little stick: take care when you put in the blue ashes that the other ingredients are not too hot, as that would make the colour too black: when all is well mixed, and before it is quite cold, take two pieces of glass, which must be made wet with water; then pour on one of them this composition, in order to roll it in sticks under your fingers, which must be wet.

In order to give this wax the necessary polish, pass the sticks over the flame of spirits of wine, which are to be lighted for this purpose.

C H A P. XXIX.

A philosophical Mushroom.

AMONG the numerous and surprising phenomenons produced by different chymical proceedings, one of the most curious is certainly that of the inflammation of essential oils, by the mixture of nitrous acid. It is certainly astonishing to see a cold liquor take

fire on pouring another cold liquor on it; such are the means by which one may form in three minutes the mushroom, called the philosophic mushroom.

In order to make this extraordinary and entertaining experiment, you must provide yourself with a glass, having a large foot, the basis of this glass is to terminate in a point, as the annexed figure shews.



Put in the glass an ounce of spirits of nitre, well rarified; then pour over it an ounce of essential oil of guaiacum. This mixture will produce a very considerable ferment, attended with smoke, out of which there will rise, in the space of three minutes, a spongy body, resembling perfectly a common mushroom.

This spongy substance, formed by the fat and oily particles of the guaiacum wood, being

being drawn up by the air, covers itself with a very thin coat of the matter that composes the oil of guaiacum.

C H A P. XXX.

To make a Ring shift from one Hand to another, and to make it go on whatever Finger is required on the other Hand, while somebody holds both your Arms, in order to prevent any Communication between them.

DESIRE some person in the company to lend you a gold ring, recommending him at the same time to make a mark on it that he may know it again.

Have a gold ring of your own, which you are to fasten by a small cat-gut string to a watch barrel, which must be sown to the left sleeve of your coat.

Take in your right hand the ring that will be given to you; then taking with dexterity near the entrance of your sleeve the other ring fastened to the watch barrel, draw it to

the fingers ends of your left hand, taking care nobody perceives it: during this operation, hide between the fingers of your right hand the ring that has been lent to you, and hang it dexterously on a little hook sewed on purpose on your waistcoat near your hip, and hid by your coat; you will after that shew your ring which you hold in your left hand; then ask the company on which finger of the other hand they wish it to pass. During this interval, and as soon as the answer has been given, put the before-mentioned finger on the little hook, in order to slip on it the ring; at the same moment let go the other ring, by opening your fingers: the spring which is in the watch barrel, not being confined any longer, will contract, and make the ring slip under the sleeve, without any body perceiving it, not even those who hold your arms, as their only attention being to prevent your hands from communicating, they will let you make the necessary motions. These motions must be very quick, and always accompanied by stamping with your foot.

After this operation, shew the assembly that the ring is come on the other hand:
make

make them remark well that it is the same that had been lent you, or that the mark is right.

Much quickness and dexterity must be made use of to succeed in this entertaining trick, that the deception may not be suspected.

C H A P. XXXI.

To guess, by smelling, which has been the Number struck out by a Person in the Company, in the Product of a Multiplication given him to do.

PROPOSE to a person of the company to multiply, by whatever number he pleases, one of the three sums which you will give him on a piece of paper; desire him to strike out whatever figure he pleases of the product of his multiplication, let him change and invert the order of the remaining figures after the defalcation he has chosen.

While the person is making his calculation and the subsequent operations, go in another room; when you are told you may return, desire the person who has done the multiplication, to give you the remaining

product on a piece of paper or card; put it to your nose as though you would smell it; then you will tell him, to the great astonishment of the whole Company, what figure he had struck out.

In order to do this operation, first observe, that the figures composing each of the three sums you propose to be multiplied, do not exceed the number of 18.

E X A M P L E.

Suppose the three sums proposed to be the following:

$$\begin{array}{r} 315423 \\ \hline 99 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 132354 \\ \hline 99 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 252144 \\ \hline 99 \\ \hline \end{array}$$

Supposing that the sum chosen to be multiplied be that of - - 132354
And that the multiplicator be - 7

The product will then be - 926478

Suppose likewise that the figure which has been struck out is the 6, the remaining ones will form a sum of 92,478.

As

As you let the person who has done the multiplication set down the figures in the order he pleases, suppose also that he sets them down thus, on the piece of paper he gives you.

79,482.

When you pretend to smell the paper, add together in your mind the figures presented to you, in order to reduce them to nines; and say in your mind 7 and 2 make nine; after that 8 and 4 make 12; in 12 there is 9, and three remains towards 9 more; to complete which 6 is wanting, which is and must be the figure struck out. This calculation must be made quickly, and while you pass the paper under your nose under the pretext of smelling it.

There is another manner of proceeding to guess the figure left out, by letting the person chuse the sum he pleases to be multiplied, but then you must ask him to shew you the sum he means to have multiplied, and to let you add one figure at your option.

In that case, by running your eyes over the sum set down, you will easily see what figure you are obliged to add in order to complete the number of 9.

In

E X A M P L E.

In the supposition that the sum set down is the following :

789,788

Add in your mind thus: 7 and 8 are 15, and 9, 24; and 7, 31; and 8, 39; and 8 more, 47: in 47 there is 5 times 9, as 9 times 5 make 45; there remains 2, therefore in order to complete 9, 7 are to be added; consequently the sum to be multiplied will be 7,897,887.

Then give this sum, which has been increased by a 7, to the person who has presented it to you: and tell him to chuse whatever multiplier he pleases; then retire while he does the multiplication, recommending him to strike out the figure he pleases, as usual, and to set down on a piece of paper the remaining sum, the figure being defalcated, and the remaining figures ranged as he pleases; and in order to guess the number that was struck out, you are to proceed as it has been explained for the first manner of operating, and with the same tricks.

C H A P.

C H A P. XXXII.

To make any Pen-knife out of three jump out of a Goblet, agreeable to the Option of the Company.

TAKE a silver goblet, as, on account of its opacity, it will hide the means you will employ to make the pen-knife jump out at the desire of the assembly.

This operation consists in a small spring, about an inch broad, by two inches and a quarter long.

You are to take care to subject or bend this spring before you begin the trick with a little bit of sugar, which being compressed between the two ends of the spring, will prevent it from unbending.

Then ask the company, shewing your three pen-knives of different colours, which of them they chuse to see jump out of the goblet.

Put afterwards your three pen-knives in the goblet, taking care to lay the end of the handle of the chosen pen-knife in a little round hole that is in the upper end of the spring, confined by the bit of sugar; and before you
with-

withdraw your hand from the goblet, which must contain in the bottom some drops of water, take a little of it with the tip of your finger, and put it dexterously on the sugar, which by melting will leave the spring at liberty to extend and make the pen-knife jump out.

While the sugar is melting, you may stand far from the goblet, and command the pen-knife to jump out; and this will be done to the great astonishment of the spectators. Yet nothing is so simple as the means to make this experiment succeed, without the least assistance from any confederate.

N. B. These little springs, fit for use, may be had of Mr. PINETTI, Hay-Market.

C H A P. XXXIII.

To pull off any Person's Shirt, without undressing him, or having Occasion for a Confederate.

THIS trick requires only dexterity; and nevertheless, when I performed it at the Theatre-Royal in the Hay-Market, every body imagined that the person whom I had tricked out of his shirt was in a confederacy with me.

The means of performing this trick are the following; only observing that the cloaths of
the

the person whose shirt is to be pulled off be wide and easy.

Begin by making him pull off his stock, and unbuttoning his shirt at the neck and sleeves, afterwards tye a little string in the button-hole of the left sleeve; then, passing your hand behind his back, pull the shirt out of his breeches, and slip it over his head; then pulling it out before in the same manner, you will leave it on his stomach; after that, go to the right hand, and pull the sleeve down, so as to have it all out of the arm: the shirt being then all of a heap, as well in the right sleeve as before the stomach, you are to make use of the little string fastened to the button-hole of the left sleeve, to get back the sleeve that must have slipped up, and to pull the whole shirt out that way.

To hide your way of operating from the the person whom you unshirt, and from the assembly, you may cover his head with a lady's cloak, holding a corner of it in your teeth.

In order to be more at your ease, you may mount on a chair, and do the whole operation under the cloak. Such are the means I used when I performed publicly this trick.

C O N T E N T S.

| | Page |
|--|-------|
| P REFACE - - - - - | 5 |
| C HAP. I. Curious Method of restoring to Life, in two Minutes; a Fly that has been drowned even twenty-four hours. - - - | 11 |
| C HAP. II. To make a Colour that will appear or disappear by Means of the Air - - - | 12 |
| C HAP. III. Method of drawing a deformed Fi- gure, which will appear well proportioned from a certain Point of View - - - | ibid. |
| C HAP. IV. To change the Colour of a Rose - - - | 13 |
| C HAP. V. To render hideous the Faces of all the Company - - - - - | 14 |
| C HAP. VI. Method of Engraving in Relief on the Shell of a new-laid Egg - - - | ibid. |
| C HAP. VII. To shoot a Swallow flying, with a Gun loaded with Powder, as usual; and after, to find Means to bring it to life again - - - | 15 |
| C HAP. VIII. To make a Calve's Head bellow as if alive, when dressed and served up - - - | 16 |
| C HAP. IX. A puzzling Question to be proposed for Solution. - - - - - | 17 |
| C HAP. X. To dispose two little Figures, so that one shall light a Candle, and the other put it out - - - - - | 19 |
| C HAP. XI. A curious Secret to make a Card pass from one Hand into the other - - - | 20 |
| C HAP. XII. To change a Card which is in the Hand of a Person, recommending him to cover it well - - - - - | 23 |
| C HAP. XIII. To guess a Card that has been thought of by any body, by writing before- hand on a Paper or Card a Number, which will certainly be that of the Card that has been thought of - - - - - | 25 |
| C HAP. | |

C O N T E N T S.

| | Page |
|--|-------|
| CHAP. XIV. A mathematical Combination for guessing, in a whole Pack composed of Fifty-two Cards, how many Points will make the Cards under each Parcel, which Parcels are to be made by one of the Company, observing to him that each Parcel he makes is to compose the Number of Thirteen, to begin from the Point of the first Card which he takes to form each Parcel. | 28 |
| CHAP. XV. To guess the Thoughts of any Person, assuring him, that you will write beforehand on a Piece of Paper the Amount of the Parcel of Cards he shall happen to chuse out of the two placed on the Table. | 32 |
| CHAP. XVI. A curious and agreeable Wager, which you are sure of winning | 34 |
| CHAP. XVII. A trick with Cards; uniting the double Advantage of being very easy and infallible, it being on a little numerical Combination | 35 |
| CHAP. XVIII. Sympathetic Inks. | 36 |
| CHAP. XIX. To make an Addition before the Figures are set, by knowing only how many Figures are in each Row; as likewise how many Rows compose the whole; and then adding yourself some Figures equal to those that had been set | 38 |
| CHAP. XX. An artificial Spider, which moves by Electricity | 42 |
| CHAP. XXI. To extinguish two Wax Candles, and light two others, distant about three Feet, by the firing of a Pistol, loaded with Powder, as usual | 43 |
| CHAP. XXII. To compose a red Colour, imitating the Colour of Blood | 44 |
| CHAP. XXIII. To extinguish a Wax Candle, at eighty or a hundred Paces distance, by firing a Gun loaded with Ball, and to be certain of not missing, however unskilful may be the Marksman | 47 |
| | CHHP. |

C O N T E N T S.

| | Page |
|---|------|
| CHAP. XXIV. To cut a Glafs, a Looking-glass, or even a Piece of Cryftal, let it be ever fo thick, without the Help of a Diamond, in the fame Shape as the Mark of the Drawing made on it with Ink | 49 |
| CHAP. XXV. To melt a Piece of Steel, as if it was lead, without requiring a very great Fire | 50 |
| CHAP. XXVI. To unite Wax and Water, (Things absolutely oppofite to each other); this Union, made in the twentieth Part of a Minute, forms a good Pomatum to clean the Skin, and render it foft and white. It is a fine Cosmetic | 52 |
| CHAP. XXVII. A curious Method or fealing a Letter, fo as not to be opened, by variegating the Seal with different coloured Species of Wax | 53 |
| CHAP. XXVIII. To make fine blue Wax, which is very difficult to be had | 54 |
| CHAP. XXIX. A philofophical Mushroom | 55 |
| CHAP. XXX. To make a Ring shift from one Hand to another, and to make it go on whatever Finger is required on the other Hand, while fomebody holds both your Arms, in order to prevent any communication between them. | 57 |
| CHAP. XXXI. To guefs by fmelling, which has been the Number truck out by a Perfon in the Company, in the Product of a Multiplication given him to do. | 59 |
| CHAP. XXXII. To make any Pen-knife out of three jump out of a Goblet, agreeable to the Option of the Company | 63 |
| CHAP. XXXIII. To pull off any Perfon's Shirt, without undreffing him, or having Occafion for a Confederate | 64 |

T H E E N D.

