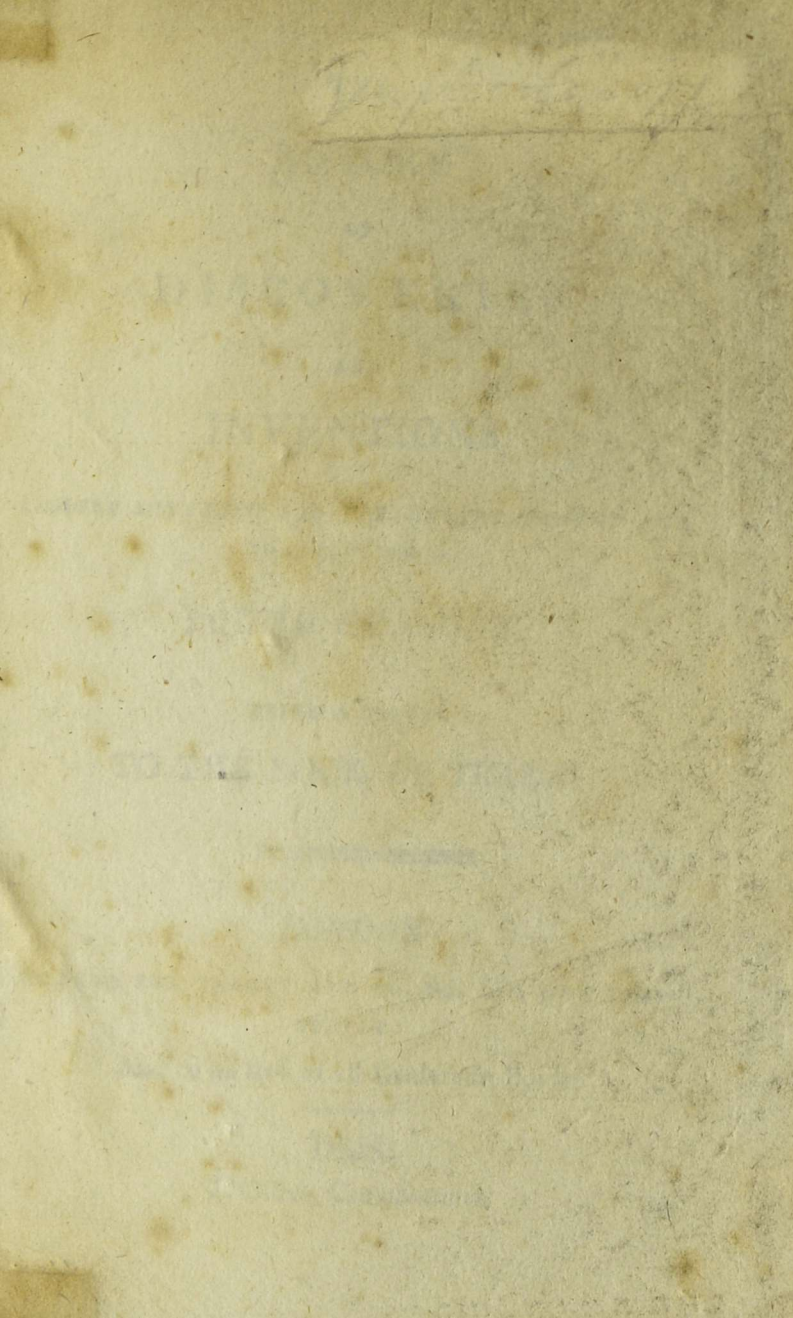


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UNIVERSITY OF CHICAGO

INVESTIGATION

REPORT OF THE INVESTIGATION

OF THE

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THE
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OF
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AND
INVENTIONS,

CHIEFLY INTENDED FOR THE ENTERTAINMENT AND
INSTRUCTION OF

YOUNG PERSONS;

BEING A SEQUEL
TO THE BOOK OF TRADES.

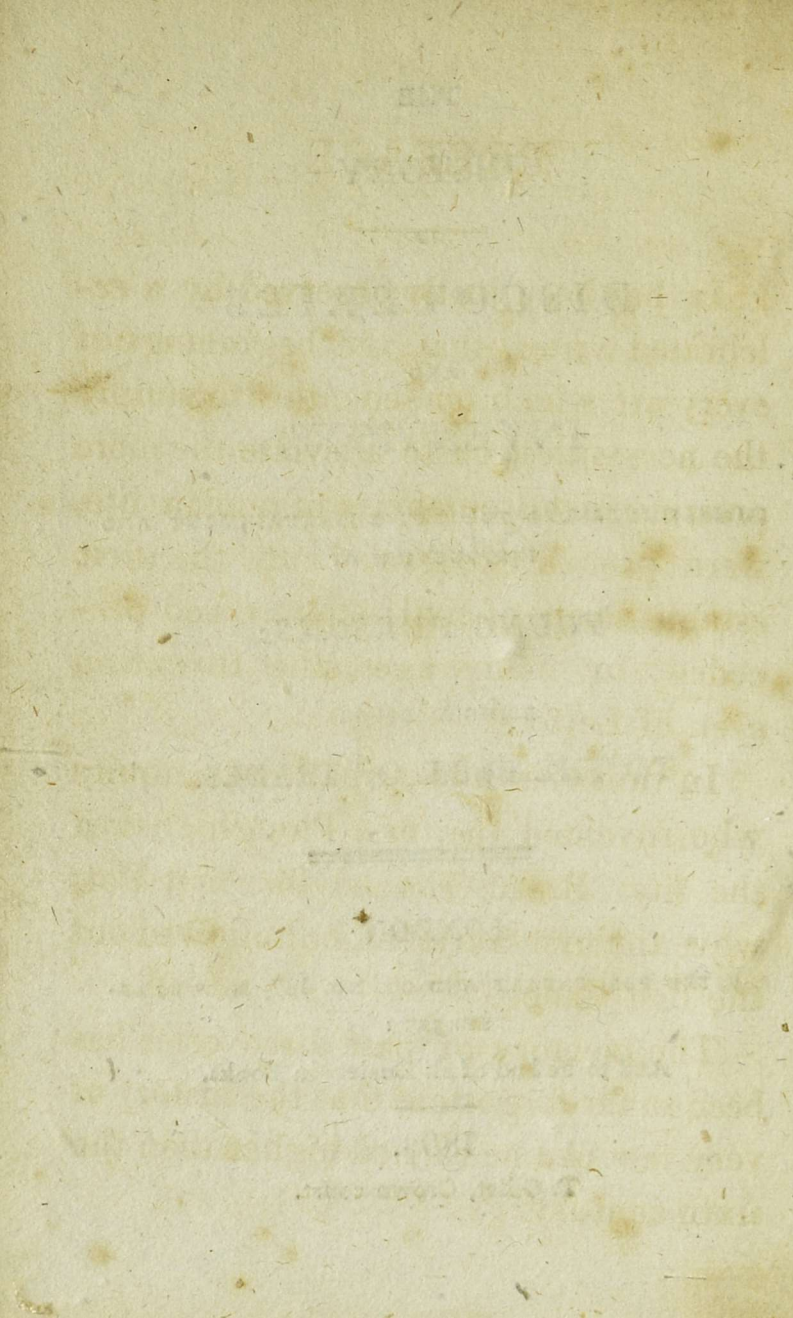
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PREFACE.

IT has been justly observed by a celebrated writer, that the beginnings of every art which tended either to supply the necessities, or to alleviate the more pressing inconveniencies of human life, were probably coeval with the first establishment of civil societies, and preceded by many ages the invention even of Letters.

In vain, he adds, shall we enquire who invented the first Plough, baked the first Bread, shaped the first Pot, wove the first Garment, or hollowed out the first Canoe.

The memory of past discoveries has been so far forgotten, that the history of very few can be carried higher than the sixth century.

Moses, indeed, has recorded the names of three inventors in the very earliest period of the world. Jabel, we are told, was the father of such as dwelt in tents; Jubal, the father of all such as handled the harp and organ; and Tubal-Cain the instructor of every artificer in brass and iron. But there is a great gap between the traces of these discoveries, and the more minute history of such as still minister to our comfort, or increase the innocent enjoyment of life.

In some cases it is singular to remark, how many of the most valuable disclosures have had their origin in trivial accidents. The purple dye, it is asserted, was discovered first at Tyre, when a dog, having seized the fish by which it was produced, tinged his mouth with the colour. The efficacy of the

Jesuit's bark was discovered in a rivulet which had been tainted by the tree; and the power of steam, by an accident as casual.

Of a few discoveries the rudiments appear to have been known long before the inventions were completed. The optical principles, for instance, on which Telescopes were founded, are contained in the mathematical works of Euclid, and were well known to the old geometers. Yet for want of attention, the world was without the discovery till the sixteenth century. And it is probable that numerous other inventions lie hid in other principles, which wait either for reflection or accident to bring them forth.

To the origin of many inventions also we find two, and sometimes three, claimants; apparently with an equal

PREFACE.

title. Roger Bacon it will be found foresaw the probability of others discovering the secret which his own humanity led him to withhold. Spectacles are said to have been invented a second time, by the ingenuity of a monk, who could not obtain the art of making them from the first inventor. And Microscopes were discovered at the same time in Italy and Holland.

The dates and facts contained in this little work have been collected from the best and most approved authorities. The different Inventions, Discoveries, and Introductions, are arranged in it, for the most part, chronologically, that in the course of perusal the reader may ascertain for himself the improvements of succeeding centuries; and learn to appreciate the great advantages which mark the present condition of society.

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THE
HISTORY
OF
INVENTIONS,
&c. &c.

PAPER.

THE materials on which mankind have contrived to write their sentiments in different ages and different countries, have been extremely various. The most ancient, perhaps, were stone and plates of metal. Tablets of wood, particularly of the cedar-wood, were afterwards used: and these were again followed by tablets covered with wax, which were written on according to the fashion of the time, either with iron

bodkins, the bones of birds, or reeds cut into the form of pens.

At length the *papyrus* of Egypt was invented, which not only gave a great facility to the art of writing, but was a portable material. It was formed of thin coats stripped from the reed which grows upon the banks of the Nile. The date of its discovery and the date of its disuse have been equally disputed. Nor is it yet completely ascertained whether its first application may be ascribed to an earlier or a later date than the conquest of Egypt by the Macedonians.

Parchment was the next invention; originating in a country where no such material as the *papyrus* reed could be discovered: and it has been found at once so durable and useful that it is still employed upon important occasions in every European country.

The art of making PAPER, such as we now see it, was a late discovery; and its first material was cotton. The linen paper, which is now in use, is supposed to have *followed* the discovery. They are both dated by the generality of writers at the eleventh or twelfth century, though the honour of the discovery is claimed not only by different but distant nations.

The first book which was printed on Paper, *manufactured in England*, came out without a date, about 1495 or 1496: though for a long while afterwards it was principally brought from abroad.

The first Paper-Mill in England was established about 1590 at Dartford in Kent, by one Spilman, who died in 1607.

WRITING-PENS.

It has been already mentioned that in ancient times, when people wrote on tables covered with wax, they were obliged to use a style, or bodkin; but when they began to write with coloured liquids, they employed a reed, and afterwards quills or feathers.

The most beautiful reeds grew formerly in Egypt, as well as in Armenia and Italy.

Sir John Chardin speaks of the reeds which grow in the marshes of Persia, and which are sold, and much sought after in the Levant, particularly for writing. They are transported, he says, throughout the whole East. Mil-

ler, in his Gardener's Dictionary, says, the best writing-reeds are procured from the southern provinces of Persia. They are still used by the Turks, Moors, and other Eastern people.

These reeds are split, and formed to a point like our quills: but it is not possible to make so clear or fine strokes with them, or to write so long or so conveniently.

The oldest certain account, however, known at present respecting writing-quills, is a passage in an author, (Isidore) who died in the year 636, and who, among the instruments employed for writing, mentions reeds and *feathers*.

Alcuinus, who lived in England in the eighth century, speaks of the *pen*; so that it must have been used in this country almost as early as the art of writing was known.

INTRODUCTION OF SILK-WORMS INTO EUROPE.

THE rise and history of the silk manufacture would form so large a portion of a history of commerce, that little in a general form can be mentioned here.

The nations of the East appear to have had the knowledge of silk at a very early period. It was not, however, brought into Greece till after the conquest of Persia by Alexander the Great, about three hundred years before the birth of our Saviour: whence, in the more flourishing state of the Roman empire, it came to Italy. The care, however, which was taken to con-

ceal the manufacturing of silk, made it for a very long time very dear in the western quarter of the world. So dear, that gold itself was not of greater value.

The emperor Justinian, it is said, who began his reign in the year 526, finding that the manufactured article was purchased at an exorbitant rate from the Persians, sent two monks to India, with directions not only to learn how the silk trade was managed, but to bring with them at their return, if possible, some of the species whether vegetable or animal, from which the silk was produced; that so he might set up the manufacture in his own dominions.

These monks, when they returned, told him that the silk was produced by an insect, which could not possibly be brought so far alive, but that they had

obtained great quantities of their eggs, with instructions not only for hatching them, but for rearing and feeding the worms, and drawing out the silk, and spinning and working it. Soon after this, about the year 556, manufactures were established at Athens, Thebes, and Corinth. The Venetians, however, commencing a commerce with the Greek empire, supplied all the western parts of Europe for many centuries, and obviated the necessity which had previously existed of establishing the manufacture itself. But about 1130, Roger II. king of Sicily, seizing on the manufacturers at Athens and Corinth, in his way to to the Holy Land, not only transported them to Palermo, in his own country, but likewise the worm and the tree on which it fed.

By degrees, adds Mezeray the French

historian, the rest of Italy and Spain learned from the Sicilians and Calabrians the management of the silk-worm, and the art of making silk: and, at length the French got it by right of neighbourhood. In 1494, we are told, Charles the VIIIth brought the mulberry plant from Naples to Provence; and afterwards planted it both in Dauphiny and Languedoc. After the civil wars also, the plantations of mulberry trees were much encouraged by Henry the Fourth.

Toward the latter end of Elizabeth's reign, if not earlier, the cultivation of the mulberry tree, with a view to the establishment of a silk trade, totally independant of our commerce, became a main object with the English. James I. also, in 1608, addressed letters on the subject, to the sheriffs of the different

counties. In consequence, numerous plantations of mulberry trees were made in different parts both of England and Ireland. But the great quantities required before a manufactory could be established, probably checked the project: and we have been since contented to work upon the raw materials obtained in foreign trade.

In China and Persia, the common black mulberry is the tree most encouraged: but in France and Italy the white mulberry is preferred.

THE GREEK FIRE.

THE Greek fire seems to have been one of the most terrible instruments of destruction employed in the military operations of the twelfth century.

It was called *Greek* fire because it was invented by the Greeks of the eastern empire, who, for several centuries, kept the composition of it a profound secret. In that period, the emperors of Constantinople used to send quantities of this fire to princes in friendship with them, as the most valuable present they could give them, and as the greatest mark of their favour. But the composition of this liquid fire, as it is sometimes called, seems to have been no longer a secret

in the twelfth century, as it was then used in very great quantities, not only by the Christians of all nations in the Holy Land, but also by the Turks. It is said to have been a composition of sulphur, bitumen, and naphtha. It had a very strong and disagreeable smell, as we may easily suppose from its ingredients ; burnt with a livid flame ; and so intense a heat, that it consumed not only all soft combustible substances, but even stones and metals. When it fell, in any considerable quantity, upon a warrior, it penetrated his armour, and peeled his flesh from his bones, with exquisite pain, which made it an object of great terror. This liquid fire was kept in phials and pots, and in these was discharged from machines upon the enemy. One of its most singular properties was, that it burnt in water,

which did not in the least abate its violence, but it yielded to several other things, particularly to sand, urine, and vinegar. For this reason, when an army made an assault in which they expected to be opposed by Greek fire, they provided themselves with these things for its extinction. Dr. Henry, from whose *History of Britain* the above account has been quoted, gives the following passage from Geoffrey de Vinesauf's *Description of the Siege of Damietta*. "Greek fire was discharged upon the assailants from the walls of the castle and city, like lightning, and struck them with great terror; but they endeavoured to preserve themselves from it, by sand, vinegar, and other extinguishers." We find it used as late as 1383.

COATS OF ARMS.

THE use of coats of arms, says Dr. Henry, distinguishing one great family from another, and descending from father to son, appears to have been introduced into Britain about the same time with family-surnames, and by the same noble Normans. The Anglo-Saxon warriors adorned their shields and banners with the figures of certain animals, or with other devices; but in doing this, every particular person followed his own fancy, without any regard to the figures or devices that had been borne by his ancestors. But about the time of the first croisades, greater attention began to be paid to these de-

vices, when it was discovered that they might be useful, as well as ornamental. “ About this time (says the learned “ Camden) the estimation of arms began in the expeditions to the Holy “ Land ; and afterwards, by little and “ little, became hereditary ; when it “ was accounted most honourable to “ carry those arms which had been displayed in the Holy Land, in that holy “ service, against the professed enemies “ of Christianity.” Justs and tournaments, the favourite diversions of the great and brave in this period, contributed not a little to render arms hereditary. For a noble son, proud of the honours that had been gained by an illustrious father in those fields of fame, delighted to appear with the same devices on his shield at the like solemnities. It was only, however, by slow

degrees, and in the course of almost two centuries, that this custom became constant and universal even in noble families.

The earliest Seals bearing shields of arms, known in England, are those of John Earl of Morton, afterwards King John, and Gervase de Paganel, A. D. 1187.

GOLD MONEY.

It may perhaps appear strange, that Henry III., in 1257, in the height of distress for want of money, should be the first prince that ever coined gold in England. The piece he caused to be struck was of pure gold, about the size of a shilling; and was to pass in the common proportion of gold to silver for twenty pennies of the latter metal. It is not said for what reason, but only, that in the month of November that year, the citizens of London petitioned against it and Henry consented to call it in.

Of this curious coin, which has a full length figure of the King on one side, sitting on his throne, three spe-

cimens only are remaining, one of which is now deposited in the British Museum. It is called the gold penny of King Henry the Third.

Till Edward the Third's time we had no more gold money. But he, by the advice of his Council, in 1344, commanded florins of gold to be coined to pass for six shillings, half-florins to pass for three shillings, and quarter-florins for one shilling and sixpence. A few months after, however, the name and value of the coins were changed; and gold nobles, half nobles, and farthing nobles were made known by proclamation, the first to go for six and eightpence, and the others in proportion. The noble had the figure of the King represented armed in a ship, in commemoration it is supposed of the naval victory he had obtained. Such were the earliest gold coins of England.

USE OF SEA-COAL.

IN 1234, when Henry the Third confirmed the charter of his father to Newcastle upon Tyne, he gave the townsmen, on their supplication, licence to dig coals and stones in the common soil without the walls, called the Castle moor, and to convert them to their own profit. This, says Dr. Anderson, is the first mention of coals dug at Newcastle, which were then probably confined as fuel to the use of the town; for the city of London had at that time so many woods and copses round it, and the carriage both by land and water was so cheap, that coals from Newcastle would have been far more expensive

than the wood and turf fuel from its own neighbourhood.

The historians of London relate, that, in Edward the First's reign, sea-coal was in so much request with several of the city-trades, such as dyers, brewers, &c., that on the complaint of the nobility and gentry that they could not go to London on account of the noisome smell and thick air, the King issued a proclamation, forbidding the use of it, even in the suburbs, on pain of fine, loss of furnaces, &c. Those trades, however, finding the scarcity and price of wood-fuel daily increasing, discovered it was still their interest to use sea-coal; and, notwithstanding the prohibition, entered on the trade with Newcastle. In 1357, the townsmen's licence to dig coal was increased by a special grant from the Crown, of the soil

in which they had before only liberty to dig; and in 1379 the trade had grown so considerable that King Edward the Third imposed a duty of sixpence a ton, each quarter of the year, on all ships from Newcastle laden with coal. Such was the introduction of sea-coal to common use.

THE MARINER'S COMPASS.

THE magnet, or loadstone, was certainly known to the philosophers of ancient Greece, for its quality of attracting iron; and, in later ages, the few who were in possession of the secret were enabled to perform tricks which the amazement of the ignorant ascribed to magic: but till about the end of the twelfth century we find no good authority to shew that its more valuable property, its polarity, or that power by which one point of it, or even of a needle or bar of iron touched with it, turns to the North pole, was known, at least in the western parts of the world.

Several authors, says Mr. Macpherson in his *Annals of Commerce*, strenuously assert that the Chinese have known the polarity of the magnet, and have had the use of the compass, a great many centuries before it was known in Europe. But they do not seem satisfactorily to prove their point, since after *asserting* that the compass was known, they fail in proving the knowledge of its most valuable use, in conducting a ship across the ocean.

About the conclusion of the twelfth century, says Mr. Macpherson, the earliest notice, I believe, that is to be found of the polarity of the magnet, and its use by seamen, appears in the *Poetical Works of Hugues de Bercy*, called also *Guiot of Provins*.

Jacobus de Vitriaco, also, who lived at the same time, and was Bishop of Acon

in Palestine, writing on some of the natural productions of the East, mentions it under the name of Adamant, but at the same time describes it as indispensably necessary to all who used the sea.

In defiance, however, of these authorities, the Italian writers claim the honour of the invention for Flavio Gioia, a citizen of Amalfi on the coast of the Adriatic, who they say first used it in the year 1302 or 1320.

The truth, however, seems to be that the very early mariners to whom the use of the magnetic needle was familiar were accustomed to place it on a floating straw: while the addition of a circular card, on which the different winds were represented, affixed to the needle and traversing with it, was apparently the improvement of Gioia. If other

proofs were wanting to shew that the invention was known long before the beginning of the thirteenth century, numerous writers might be quoted by whom its form and qualities are successively described. Peter Adsiger, whose letter dated in 1269, is said yet to remain in the library of the university of Leyden, not only wrote upon the various properties of the magnet, and the construction of the azimuth compass, but on the *variation* of the magnetic needle: a discovery, the credit of which was attributed first to Columbus in 1492, and afterwards to Sebastian Cabot in 1500, who seem only to have had greater opportunities than other people of remarking that the needle was not perfectly true to the north point, but diverged or varied a little from it.

CLOCKS AND WATCHES.

It is not known to whom we are indebted for the invention of the ingenious and useful art of making clocks of metal, for measuring time, and striking the hours. The first clock we hear of in England, was placed in the old clock-tower, which formerly stood opposite the gate of Westminster hall, and is said to have been purchased with part of a fine of eight hundred marks, or 520*l.* imposed upon Randolph de Hengham, chief justice of the King's-bench, in 1288. Soon after this, another clock, which cost no more than 30*l.* was set up in the cathedral of Canterbury, in 1292. These most ancient

clocks were probably imported from abroad, or at least made by foreign artists.

About seventy years after this, King Edward the Third invited three clock-makers of Delft to come into England, and granted them a protection to exercise their trade in any part of the kingdom. By these means, before the end of the fourteenth century, clocks became common in our cathedrals and conventual churches. Chaucer, one of the best of our old poets, who lived at this time, compares the crowing of a cock to a church-organ for sweetness, and to a *church-clock* for exactness as to time.

Of the *astronomical clocks*, one of the first was made by an abbot of St. Albans in the reign of Richard the Second. It represented the revolutions

of the sun and moon, the fixed stars, and the ebbing and flowing of the sea. When he had finished it, so deficient were we at that time in the knowledge of mechanics, that he was obliged to compose a book of directions for managing and keeping it in order, lest it should be ruined by the ignorance of the monks.

WATCHES were also made, or at least used in England, not long after the beginning of the fourteenth century.

One, which belonged to Robert Bruce, who was King of Scotland from 1306 to 1309, is now in the possession of his Majesty; and that which belonged to Oliver Cromwell is still preserved in the British Museum. The King of Scotland's is not of a larger size than those which are at this day used: and Oliver Cromwell's instead of a chain, winds up with cat-gut.

Pendulum watches were invented by Dr. Hooke, about the year 1658.

About a hundred years ago, Thomas Tompion was celebrated as the best watch-maker in Europe. He was originally a farrier, and began his great knowledge in the equation of time by regulating the wheels of a jack to roast meat. He was watch-maker to Queen Mary the Second ; and died November the 20th, 1713.

GLASS.



THE first invention of glass is, perhaps, a subject of too remote a date to be mentioned here. It is probable that it could not have been unknown in the oldest periods of the world: since it must have been at least as ancient as pottery itself, or the art of making bricks: for scarcely can a kiln of bricks, or a batch of pottery-ware be made, but some of the bricks and ware will be at least superficially turned to *glass*.

The earliest positive authority relating to the use of *glass in windows* is said to be as old as the third century, in a passage of Lactantius, one of the fathers of the Christian church,

The venerable Bede states that Benedict, who built the church of Weremouth in the county of Durham, as long back as the year 676, introduced not only glass windows but the *manufacture* of them into England.

For many centuries afterward, however, glass-windows were not in common use: the generality of our churches continued either without windows entirely, or with wooden lattices only. About the reign of Edward the Third we find them common.

Painted glass is said by some writers to have been introduced in the reign of John, although we have no known specimens earlier than the time of Henry the Third. The brightest windows are perhaps those of Henry the Sixth's time.

Instead of LOOKING GLASSES, some-

thing similar to which is related to have been found at Herculaneum, the Romans used plates of polished steel. Looking-glasses were really an invention of the lower ages. In the thirteenth century, the Venetians were the only people who had the art of making them of chrystal. The great glass works at Murano, in the neighbourhood of Venice, furnished all Europe, for centuries, with the finest glasses that were made.

The first plates for looking-glasses and coach-windows *manufactured in England*, were made at Lambeth in 1673, by the encouragement of the Duke of Buckingham, who, in 1670, introduced a few Venetian artists.

The manufacture of DRINKING-GLASSES appears to have been begun in England in 1557; the finer sort was made

in London in the place called Crutched Friars. The fine flint-glass, little inferior to that of Venice, was first made in the Savoy house in the Strand. This manufacture appears to have been much improved in 1635, when it was carried on with sea-coal or pit-coal, instead of wood, and a monopoly was granted to Sir Robert Mansell, who was allowed to import the fine Venetian glasses for drinking, the art of making which was not brought to perfection till the reign of William the Third.

NUMERAL FIGURES.

THE numeral figures 1, 2, 3, 4, 5, 6, 7, 8, 9, which we now employ, have not been very long in use. They are said to have been brought to Europe from Arabia; and the Arabs are stated to have obtained them from the Indians about the year 900.

They made their appearance in England about the year 1250, and were at first used in astronomical, mathematical, and geometrical works only. Their use was little valued apparently till after the discovery of printing, when it was soon found that a stripling at school in a country village could by the help of these figures in a few minutes work a

sum that the most eminent mathematician of the twelfth century could not have reckoned perhaps in a whole day, with Roman numerals.

The earliest occurrence of the present vulgar figures upon a monument, in a date, is said to be 1454. In common accompts they were not generally used till the time of James the First.

The French, in allusion to their origin in Europe call them Arabic cyphers.

The *Roman* numerals, M. D. C. L. X. V. I, appear to have been used throughout Europe for many centuries.

DISCOVERY OF GUNPOWDER.

THE history of the discovery of gunpowder, says a learned and very valuable writer, is involved in much obscurity. The most ancient authors differing from each other in their account of this matter, and many of them confounding two distinct enquiries: the discovery of the *composition* of gunpowder; and the discovery of the *means of applying it to the purposes of war*.

The generality of foreign writers affirm that without controversy we ought to attribute the invention of gunpowder to Barthold Schwartz, or Barthold the Black, a monk of Goslar in Germany, and a profound alchemist.

This man having mixed together, with a medical view, nitre, sulphur, and charcoal, a spark accidentally fell upon the mixture, blew up the pot in which it was contained, and caused a dreadful explosion. The monk, astonished at the event, made several repetitions of his experiment, and thereby fully discovered the nature of gunpowder, in the year 1354. Schwartz is also said to have first employed his gunpowder to frighten some robbers from their haunts in the woods.

The use of gunpowder, however, in war, is carried back by writers of several nations to a more distant period: and it must not be concealed, that we are able upon good grounds, to trace the knowledge of its composition in our own country as far back as the close of the thirteenth century. Its ingredients

as well as its effects were unquestionably known to our ingenious countryman Roger Bacon. But that humane philosopher, dreading the consequences of communicating the discovery to the world, transposed the letters of the Latin words which signify charcoal, which made the whole obscure. By this means he rendered it difficult to discover this dangerous secret by the perusal of his works, and at the same time secured to himself the honour of having known it, if it should be discovered by any other person. Roger Bacon died at Oxford in 1292.

INTRODUCTION OF FIRE-ARMS.

THE exact time when gunpowder and fire-arms were first employed in war by the British nation is difficult to be discovered. If a metrical life of Robert Bruce may be believed, Edward the Third had cannon in his first campaign against the Scots, in 1327. The French undoubtedly used them in 1338, as well as Edward, at the battle of Cressy in 1346. By degrees, the use of cannon became more and more common, so that in a few years, the consternation that was at first produced by their explosion, was very much abated. Beside the greater guns, or cannon, a smaller kind, called hand

cannon, came in use, which were carried by two men, and fired from a rest fixed in the ground. Such it is supposed were the four hundred cannon with which the English besieged St. Maloes in 1378.

The cannon of the fifteenth century were of different kinds, shapes, and sizes; some exceeding large, and others small, distinguished from each other by different names. A writ of King Edward the Fourth's in 1481 mentions *bombards, cannons, culverines, fowlers, serpentines*, and other ordnance; together with sulphur powder, salt-petre, stones, iron, lead, and all other materials necessary for charging them.

Fire-arms of a portable construction were not invented till the beginning of the sixteenth century. In 1521, the musket, mounted on a stock, was used

at the siege of Parma: and probably soon adopted in England. Its form, however, was clumsy, and its weight very inconvenient; while the bow, in the hands of an English archer, retained the credit of having, within a determinate range, a steadier aim and greater execution.

The protector, Somerset, who knew the importance of fire-arms, had about 3000 foreigners in his pay, of whom the greater part were musketeers.

The pistol had its origin from Pistoya, a town of Tuscany, and was introduced into England about the middle of the sixteenth century. Many of the shields, said to have been the spoils of the Armada in 1588, have pistols in the centre, with little gratings for the aim. They were sometimes introduced at the butt-end of the pike; as

well as in the time of Edward the Sixth, at the lower end of the battle axe.

In the reign of James the First we find muskets and calivres among the principal weapons of the infantry, as well as pistols and carabines of the cavalry. The great alteration, when matchlocks were no longer used, took place about the third or fourth year of William III.

The progress of fire-arms in France was not dissimilar to that in England. It was not till after the accession of Francis the First, 1515, that any considerable change was effected. Between that time, and the death of Henry the Third, in 1589, pikes, the ancient weapon of the French infantry, gave place to the arquebuss; while, in the cavalry, lances were gradually and re-

luctantly exchanged for the pistol. At that period the Spaniards were far superior to the French in the art of war. The infantry of Philip the Second, by whom the use of fire-arms was very early adopted, spread terror over Europe.

SPECTACLES.

AMONG the numerous discoveries in experimental philosophy which are to be found in the works of Roger Bacon, may be reckoned his reading-glasses, which magnified letters for the use of old men and those whose eyes were weak.

The invention, however, has been claimed for one Salvino of Florence, who died in 1317: who, it is also said, refusing to discover the art of making them, to a monk of Pisa, the latter, by the dint of his own ingenuity and application, discovered the secret for himself.

Spectacles being certainly known in

two principal cities of Italy, it may be presumed that the use of them became general throughout Europe in the early part of the thirteenth century.

Subsequent improvements in the formation of glasses, with the adaptation of them to different sights, have rendered spectacles one of the most beneficial and important discoveries that have been ever made, for a large portion of mankind.

WORSTEDS.

WORSTED stuffs are said to have derived their name from the town of Worstede in Norfolk, the place where they were first manufactured. They are mentioned in the public instruments of the time of Edward the Third, in whose second year, 1328, the weavers and workers of them were enjoined by Parliament to work them up to a better assize than they had done; and an enquiry was ordered to be made after the behaviour of Robert the alnager (or measurer) of them. In the 37th year of Edward the Third, 1364, the merchants were in the habit of coming into England to purchase them; and a few years after, in 1377, considerable privileges were granted to the workers.

CHIMNEYS.

CURIOUS as it may seem, passages or funnels for the conveyance of smoke from the fire-places to the summits of houses, as we now see them, were not known in the ages of antiquity.

The oldest certain mention of chimneys is said by Beckman to occur in 1347, when many are stated to have been thrown down at Venice by an earthquake. At Rome, he also states, they were not common till the beginning of the fifteenth century, a little before which they had been introduced from Padua.

In England, however, we find mention of them at least as early as the

reign of Edward the Third, in 1362, though generally speaking they were not very common till the time of Henry the Eighth.

In the halls of our great mansions, previous to that time, a sort of brazier was usually placed in the centre under an open lantern in the roof, to which the smoke rose without inconvenience to the persons assembled round the fire. In our great kitchens, fire-places having been made against the walls, the smoke was suffered to climb to the roof, where outlets were contrived for it in different ways.

After Edward the Sixth's time scarce a cottage was built even in remote parts of the island which had not a chimney.

CARDS.

THE general opinion respecting the origin of playing cards, is, that they were first made for the amusement of Charles the Sixth of France, about 1392, at the time he was afflicted with a mental derangement. But a prohibitory edict against the use of them appears to have been made in Spain as early as 1332, which has inclined several modern writers upon this subject to refer the invention of cards from France to Spain.

An author of our own country, however, has produced evidence of a game entitled "*The four Kings*" being played in England as early as 1277, the sixth

year of King Edward the First: and thence with some degree of probability conjectures that the use of playing-cards was then known in England. Though for the space of one hundred and eighty-six years afterwards we read nothing of them.

One of our acutest writers on the subject states it as his opinion that the ARABIANS were the *Inventors* of CARDS, which they communicated to the Greeks of Constantinople, from whom the knowledge of their use was probably obtained by the Europeans during the crusades.

At the time that cards were first introduced, they were drawn and painted by the hand: the discovery of printing with blocks of wood, by which they could more easily be executed, and in greater numbers, probably made the

playing with them more general, and certainly reduced the price of the cards.

A great number of the games which were anciently played with cards are now gone out of use, and even their names forgotten. Different games are likewise played in different nations. *Lansquenet* is a French game; *Basset* is said by Dr. Johnson to have been invented at Venice; and *Ombre* was brought from Portugal by the Queen of Charles the Second. *Quadrille*, which is now so much played by elderly ladies, is a sort of *Ombre* with a fourth player. *Whist*, in its present state of improvement, has not been played above sixty years.

BRICK-BUILDINGS.

STRUCTURES of brick as we now see them, are, by no means of so old a date as may probably be supposed. Bricks indeed were much used by the Romans, though of a different size and shape to those of our own time. Instances of them may be particularly seen in the walls of Old Verulam, in the castle of Colchester, and in different parts of the abbey church at St. Albans, which was built in the Saxon times out of the ruins of the Roman city.

Bricks appear to have been again introduced in one or two instances as early as the reign of Richard the Third: though few buildings of consequence

were erected with them before the reign of Henry the Sixth. Some of the oldest and best specimens now remaining may be found in the remains of Hurstmonceaux castle in Sussex, and the gate of the rye-house in Hertfordshire, both built very early in the reign of Henry the Sixth; the Lollards tower at Lambeth Palace built in 1454; Dandelion gateway of the time of Henry the Seventh; and the old part of Hampton-court, built in 1514, by Cardinal Wolsey.

THE ART OF PRINTING.

It may perhaps be matter of surprise that the art of printing, which throws so much light upon almost every other subject, should throw none upon its own origin. The time when, the place where, and the person by whom it was invented, are equally unknown. England, however, is not concerned in the dispute. The most we know is that it was discovered either in Germany or Holland, about 1440: that the first types were made of wood, not metal: and that some of the earliest printed works were passed off as manuscripts.

The two principal cities which lay claim to the invention, are Haerlem and

Mentz: and either from one or the other, or perhaps from both, it was conveyed to the different cities and countries of Europe.

The introduction of printing into this country is undoubtedly to be ascribed to William Caxton, a modest, worthy, and industrious man, who went to Germany entirely to learn the art, and having practised it himself at Cologne in 1471, brought it to England two years afterwards. He was not only a printer, but an author; and the book which he translated, called "The Game at Chess," and which appeared in 1474, is considered as the first production of the English press.

ENGRAVING.

THE art of engraving has this in common with most others, that its source is involved in obscurity. Italy, Germany, and Holland, have respectively put in their claims to the honour of the invention. Though with what success it is almost impossible to determine.

The Italians tell us that Tomaso Finiguerra, a Goldsmith of Florence, hit upon the method of printing from an engraved plate in the year 1460 ; taking off the impression upon a moistened paper, and rolling it gently with a roller. He communicated the discovery to Baccio Baldini of his own pro-

fession and city ; who pursued it with success, and engraved several plates, from drawings of one Alessandro Botticelli, which being seen, say they, by Andrea Mantegna, he not only assisted Baldini with designs, but cultivated and improved the new art himself. It was not long before Ugo da Carpi used different stamps for the gradations of lights and shades, and thereby added a variety of tints. From Italy, they state, the art travelled into Flanders, where it was first practised by Martin Schoen of Antwerp.

The Germans contend that engraving was practised in their country long before the time of Finiguerra and Mantegna. Francis, à Bocholt, (say some of them, was the inventor of the art, and his immediate followers were Israel à Machenick, and Martin Stock.

But the Dutch will have the source of the art to be among them ; and to have flowed from Holland into Germany, and from Germany into Italy. Laurence of Haerlem, say they, invented not only printing, but also the method of taking off impressions on wood. And Peter Schoeffer found out the art of engraving on copper, and taking impressions from plates of that metal. When Mentz was taken in the year 1462, and Schoeffer's printing office broke up ; the workmen, say they, dispersed, and along with their own art carried engraving and copper-plate printing into Germany, where they became commonly practised about the year 1465. Conrad Schweynheim of Mentz, they add, with Arnold Pannartz, imported all these arts into Italy about the same year.

Thus have these three nations contended for the invention of the art of engraving. The champions of each carrying up the antiquity of the art in his own nation as high as they could.

From more reasonable evidence, however, it appears that wood-cuts for books came into use about or before 1450: and the art of printing from copper-plates may perhaps be dated as high as 1465.

The invention of *etching* seems to have been about forty years posterior to that of engraving. It appears to have been commonly practised in Germany both at Nuremburg and Franckfort about 1512. Not long after which, it is probable, the artists found out the way of uniting etching and engraving together.

Mexxotinto, the last branch of en-

graving we shall mention, was discovered by accident in 1649 by Prince Rupert. He conceived the idea of it from the circumstance of a soldier scraping the barrel of his fuzil which had got rusted. He communicated his discovery to a painter of the name of Vaillant, by whom he was assisted in his experiments: finally inventing an art which has been subsequently carried by different artists to a very high degree of perfection.

DIVING BELL.

THE invention of the diving bell is generally assigned to the sixteenth century. Those who had no idea of this machine, Mr. Beckman says, might have been easily led to it by the following experiment. If a drinking-glass inverted be immersed in water, in such a manner that the surface of the water may rise equally round the edge of the glass, it will be found that the glass does not become filled with water, even when pressed down to the greatest depth; for where there is air, no other body can enter, and by the above precaution the air cannot be expelled by the water. In like manner, if a bell of

metal be constructed, under which the diver can stand on a stool suspended from it so that the edge of the bell may reach to about his knee, the upper part of his body will be secured from water; and he can, even at the bottom of the sea, breathe the air inclosed in the bell.

The oldest information which we have respecting the use of the diving bell in Europe, is the relation of an exhibition at Toledo before the Emperor Charles the Fifth, in 1538; when two Greeks, in the presence of several thousand spectators, let themselves down under water, *in a large inverted kettle*, with a burning light, and rose up again without being wetted. It is described more than once in the works of Lord Bacon who explains its effects, and remarks that it was invented to facilitate labour under the water.

In the latter part of the seventeenth century, the diving bell appears to have been employed in undertakings of importance: particularly in attempts to recover various articles from the remains of that portion of the Spanish armada which was wrecked on the western coast of Scotland. In the year 1665, a person was so fortunate as to bring up some cannon, which, however, were not sufficient to defray the expences. Of these attempts and the kind of diving bell used, an account was given by a Scotch writer of the name of Sinclair.

Some years after, attempts of the like kind were renewed. A man of the name of Phipps formed a project for searching and unloading a rich Spanish ship which had been sunk upon the coast of Hispaniola; and represented

his plan so successfully to Charles II., that the king gave him a ship, and furnished him with every thing necessary for the undertaking. He set sail in 1683, but returned without success, though with a firm conviction of the possibility of his scheme. In 1687, Phipps, under new patronage made another endeavour, and at last succeeded in weighing up so much treasure, that he returned to England with the value of two hundred thousand pounds sterling.

The attention of the learned, in different countries, was now turned to the diving bell, the construction and use of which appears to have been well understood by one Witzen, in 1671.

The great improver of diving bells, however, in this country, was Dr. Edmund Halley. The bell which he con-

constructed about 1717, was three feet broad at the top, five feet at bottom, and eight feet in height : forming a cavity of sixty-three cubic feet. It was covered with lead, and was so heavy that it sunk to the bottom even when entirely empty : weights also were disposed round the lower edge so as to insure its sinking in a perpendicular direction. In the top was fixed a piece of strong glass to admit light, and likewise a valve to give a passage to the air corrupted by the breath. Around the inner circumference of the bell was placed a seat for the divers ; and a stool fixed to ropes hung below, on which they could stand in order to work. The whole machine was suspended from a cross-beam made fast to the mast of a ship. That the bell might be supplied with fresh air, under the water, large vessels

filled with air, and which had an opening below through which the water compressed the enclosed air, were let down by ropes. In the top of these vessels were leathern pipes besmeared with oil, through which the diver introduced air from the vessels into the bell. The bell was thus supplied in such abundance, that Dr. Halley and four other persons remained under water for an hour and a half, at the depth of ten fathom, without suffering the least injury. When the empty air vessels were drawn up, the Doctor sent his order written upon a sheet of lead with an iron spike. Dr. Halley also invented a leaden cap, in the shape of a bell, which being placed so as to cover the diver's head, enabled him to leave the greater bell when at the bottom. A thick pliable pipe which conveyed air from

the greater bell served also as a clue to the diver to find his way back.

The last great improvement of the diving bell, was by Mr. Spalding of Edinburgh, by whose contrivance several defects, which appeared in the construction of Dr. Halley's bell, were remedied. The sinking or raising of the bell was made no longer to depend entirely on the people at the surface of the water : and the contrivance of a balance weight obviated the danger of being upset by the rugged prominences of concealed rocks, to which Dr. Halley's bell was liable.

BOMBS.



IN the works of different writers on military subjects, we find different histories of the bomb.

The French authors assert, that after its first introduction, it was laid aside for a considerable time; and that some little confusion has arisen from the circumstance of its first invention being again ascribed to persons who only renewed the use of it.

Sigismund Pandolpha Malatesta, say they, Prince of Rimini, who died in 1457, invented the mortar and the bomb. Mezeray also mentions that they were used in France at the siege of Mezieres, in 1521.

Strada, however, another military writer of considerable credit, says it was an inhabitant of Venlo, in Guel-dres, who invented bombs, in 1588. The inhabitants of that town giving an entertainment to the Duke of Cleves, treated him with an exhibition of the invention. They made the first trial of it before him; and the experiment answered far beyond their expectation: for the bomb falling on a house, set it on fire, and occasioned two-thirds of the city to be destroyed. The Duke liked it so well, that he made use of it a few days after at the siege of Wach-tendouck.

But M. Blondell, who was also a writer of veracity, tells us it was only at the siege of La Motte in 1634, or according to other writers at the siege of Dole, in 1635, that the bomb was

first used in France. Louis the Thirteenth is said to have obtained an English engineer from Holland named Malthus, who employed bombs, for him with great success, at different sieges. This engineer was killed in 1658, at Gravelines.

Bombs are described by M. Cayet as having been thrown into Nimeguen by Maurice, Prince of Orange, in 1590. Till 1634, according to the best authorities, they were only used in the Dutch and Spanish armies.

PARISH REGISTERS.

IN the works of several foreign writers, we read of regulations in different parts of Europe, at a very early date, which seem to indicate the existence of parish registers. A life of Petrarch mentions a register at Avignon as early as 1308; and we are told of the institution of them at Toledo, in Spain, by Cardinal Ximenes, as early as 1497.

The first institution of them in England commenced in 1501, the sixteenth year of Henry the Seventh: although the keeping them was not strictly enjoined till the administration of Lord Cromwell, in 1538.

The good intent, however, of paro-

chial registers, was, for a long while misrepresented: and the order for keeping them but imperfectly complied with by the clergy. In the second year of King Edward the Sixth, a new order was issued: but the most effectual one was that in 1558, the first year of Queen Elizabeth, since which time, with the exception of certain intervals during the rebellion under Charles the First, and the plague of 1666, they have been, for the most part, regularly kept.

PINS AND NEEDLES.

NEEDLES, we are assured by Mr. Andrews in his "History of Britain," had made their appearance among the manufactures which were sold in Cheapside during the reign of Mary. A Spanish negro had made them, but as he refused to discover his art, the nation received little benefit from him.

In 1566, however, the manufacture of needles was again commenced, and directed by one Elias Grouse, a German.

The first mention of pins that occurs in the English Statute-Book, is found in an act of parliament of Richard the Third, A.D. 1483, prohibiting certain foreign manufactures. Soon after which the art of making them appears

to have been introduced from France. By an act of parliament passed in 1543, the mode of their production was regulated in a particular manner ; the pin was ordered “ to be double-headed, and to have the head soldered fast to the shank ; to be well smoothed, the shank well shaven, and the point well and round filed, cauted, and sharpened.” But a more ingenious and expeditious manner of making them being introduced, such as is now used, the statute was repealed three years after.

Notwithstanding there is scarcely a commodity cheaper than pins, there is none that passes through more hands before they come to sale. It is reckoned that no less than twenty-five workmen are successively employed on each pin, between the drawing of the brass wire, and the striking of the pin in paper.

TAPESTRY.

HANGINGS in tapestry are now so rarely met with but in old mansions, that the mention of them may be almost deemed superfluous here. There was a time, however, when the generality of better apartments were adorned with histories in Arras.

Richard, who was abbot of St. Albans from A.D. 1088 to A.D. 1119, made a present to his monastery of a suit of hangings which contained the whole history of St. Alban. But whether these hangings had been made in England or not is uncertain, although it is not improbable that this curious art might have been introduced by some

of the many manufacturers from the Netherlands, who even at that early period settled in Britain.

Several writers, however, assert, that the art of making tapestry was not brought into England till the end of Henry the Eighth's reign: when it was introduced by William Sheldon, Esq. whose house at Weston in Warwickshire was adorned with large tapestry-Maps of various counties in England.

In 1619, a manufacture was established at Mortlake in Surry, by Sir Francis Crane, who received 2000*l.* from King James to encourage the design. About this time the story of Don Quixote was a favourite subject for the loom.

The first manufacture of tapestry at Paris, was set up under Henry the

Fourth in 1606 or 1607, by several artists whom that monarch invited from Flanders. Under Louis XIV. the manufacture of the Gobelins was instituted, which introduced very beautiful cloths, remarkable for strength, for elegance of design, and a happy choice of colours. The finest paintings were copied in it.

INTRODUCTION OF THE SILK-TRADE
INTO ENGLAND.

It is impossible to ascertain the time when the arts of spinning, throwing, and weaving silk, were brought into England: we learn, however, that, when they were originally established, they were practised by a company of women called *silk-women*, and the articles fabricated by them consisted of laces, ribbands, girdles, and the like narrow wares. Towards the middle of the fifteenth century they were greatly incommoded by the Lombards, and other Italians, who imported the same sort of goods, and in such large quantities, that their sale was hindered, and they themselves in danger of being

starved. This was in 1454. The importation of such goods was of course prohibited, by act of parliament, in the third year of King Edward the Fourth: and the introduction of wrought silks only allowed.

About the beginning of King Henry the Eighth's reign, the silk-trade appears to have got into the hands of the men.

The silk-throwers of London were incorporated by a patent of the fifth year of Charles the First. Under subsequent sovereigns, the privileges of the trade have been increased: and duties and restrictions have been laid on the importation of such silks from Turkey, Persia, China, and the East Indies, as appear to have been detrimental by their introduction to the manufacture of silks in England.

FRUITS.

THE introduction of fruits and vegetables is not a subject of general notoriety. It may not only be curious but instructive to the young reader, to be made acquainted with the gradual increase of our table-luxuries, and to know that our ancestors lived quite as plentifully when their hospitable boards had less variety.

The Romans are said to have first brought in **CHERRIES**, which were afterwards lost, according to some writers, who suppose them to have been brought in again, from Flanders, by **Richard Harris**, fruiterer to **Henry the Eighth**. He planted them at **Tenham** in **Kent**,

whence they had the name of KENTISH CHERRIES. The Kentish pippins are probably of the same extraction. In the time of Edward the Sixth we hear of plenty of native cherries at Ketteringham, in the neighbourhood of Norwich.

The PERDRIGON PLUM was introduced by Lord Cromwell, in the reign of Henry the Seventh: and APRICOTS were brought from Italy, by Wolf the king's gardener, in 1524. The *pale* GOOSEBERRY came from Flanders about the same time; when FIGS were also introduced: and the first MULBERRY TREES are said to be those which still remain at Sion house.

MELONS, CUCUMBERS, and some other of the more expensive productions of the kitchen-garden, are said to have been very common in the time of Ed-

ward the Third. During the destructive wars between the houses of York and Lancaster, the culture of them was neglected; but they appear to have been again introduced in the time of Henry the Eighth.

ORANGES, though known to us at the beginning of the sixteenth century, do not seem to have been grown in England before the reign of Queen Elizabeth. Sir Francis Carew, who lived at Beddington house in Surrey, about 1590, is said to have first planted them in the natural ground. It was near forty years afterward before they were generally adopted as ornamental greenhouse shrubs.

It was in 1590, also, that the two first LIME TREES were brought to England.

Lord Orford had a picture which re-

presented Rose, the royal gardener, presenting the first PINE-APPLE raised in England, to Charles the Second : although the cultivation of them has been usually said to have been introduced by Sir Matthew Decker.

The TEA TREE was brought over about sixty years ago.

ARTICHOKES appear to have been first grown among us in the time of Henry the Eighth. Sir Anthony Ashley, who lived in the reign of Queen Elizabeth, first planted CABBAGES in England, which were before brought from Holland : and POTATOES were introduced by Sir Walter Raleigh from America.

The CURRANT-BUSH from Zante was introduced to the soil and climate of this country in 1582.

INTRODUCTION OF GARDEN FLOWERS.

It may be superfluous perhaps to notice here that most of the flowers introduced into our gardens, and now cultivated for their beauty, or the pleasantness of their smell, have been procured from plants which grew wild, and which have been changed, or, according to the opinion of florists, improved, by the art of the gardener. The greater part of them, however, came originally from distant countries, where they grow, in as great perfection as in ours, without the assistance of man.

In early times, in this country, such

flowers only were attended to as appeared likely to be serviceable for the purposes of medicine. The *florists* taste was not introduced till the beginning of the sixteenth century. It appears to have come first from Persia to Constantino-ple, and was imported thence to Europe. It was also encouraged by the voyagers, who occasionally brought plants from new found countries : and was in part assisted by some skilful gardeners, who, by trading in roots and seeds, rendered the taste more general.

The mention of a few of our common flowers which were then introduced will sufficiently illustrate what is here said.

Simon de Tovar, a Spanish physician, brought the *tube-rose* to Europe before the year 1594, from the East-Indies, where it grows wild in Java and Cey-

lon; he sent some roots of it to a celebrated botanist of the name of Bernard Paludanus, who first made the flower publicly known. The full *tube-roses* were first procured from seed, by one Le Cour, who kept them scarce for some years, by destroying the roots that they might not become common.

Who first transplanted the *auricula* from its native soil is not known. It grows wild among the long moss covered with snow, on the confines of Switzerland and Steyermark: and in our gardens produces more varieties than any other species of flower. It certainly was first cultivated with care by the Flemings, who were very successful in propagating it.

The roots of the magnificent *crown imperial*, were, about the middle of the sixteenth century, brought from Persia

to Constantinople, and were carried thence to the Emperor's garden at Vienna, from which they were dispersed all over Europe.

The bulbs of the *Persian lily* were first brought from Susa to Constantinople.

The *African* and *French marigolds*, with the *Bella Donna lily*, were brought about the same time with the crown imperial from South America.

The first account we have of the cultivation of *rue* in Britain, is given by Dr. Turner, who published his "Herbal" in 1562.

Lavender appears to have been cultivated in Europe but a short period before 1568.

The *Christmas rose* and the *Iris* both natives of Italy, were unknown to the

gardens of this country till cultivated by Mr. John Gerard in 1596.

The *Guernsey lily* was first cultivated in Europe, in the beginning of the seventeenth century, in the garden of John Morin at Paris, where it flowered for the first time in 1634. It was then made known by Jacob Cornutus, a celebrated botanist. After this it was again noticed by Mr. J. Ray in our own country in 1665, who gave it the name which it still very properly bears. A ship returning from Japan was wrecked on the coast of Guernsey, and a number of the bulbs of this plant, which were on board, being cast on shore, took root in that sandy soil. As they soon increased and produced beautiful flowers, they were observed by the inhabitants, and engaged the attention of Mr. Hatton, the governor's son,

whose botanical knowledge was well known, and who sent roots of them to several of his friends who were fond of cultivating curious plants. Such is the history of the Guernsey lily.

SILK STOCKINGS.

MEZERAY the French historian acquaints us, that in 1559, Henry the Second of France was the first who wore silk-stockings in that country, at the marriage of his sister with the Duke of Savoy.

They are nevertheless said to have been worn in this country earlier, both by Henry the Eighth and Edward the Sixth. The latter was presented with a pair of long Spanish silk stockings by Sir Thomas Gresham.

Howell relates in his History of the World, that Queen Elizabeth, in the third year of her reign, 1561, was presented with a pair of black knit silk stockings by her silk-woman Mrs. Montague, and thenceforth she never wore cloth ones any more.

CANARY BIRDS.

As the canary bird was not brought to Europe till after the fifteenth century, we find no history of it in the works of our early ornithologists.

About 1550 it appears to have been first brought from the Canary islands: but was so dear, that it could be procured only by people of fortune. It was at that time called the sugar-bird, because it was said to be fond of the sugar-cane, and could eat sugar in abundance.

In the middle of the sixteenth century, these birds began to be bred in Europe, at first by accident rather than design. A vessel, which, among

other commodities, was carrying a number of canary birds to Leghorn, was wrecked on the coast of Italy; and these birds, being thus set at liberty, flew to the nearest land, which was the island of Elba, where they found the climate favourable, and at first multiplied, though they are now extinct.

The breeding of these birds in Europe was for a while attended with great difficulty; partly because the treatment they required was not known, and partly because males chiefly and few females were brought over. The Spaniards being desirous as much as possible of securing the trade in them to themselves.

In later times a variety of treatises have been published in different languages on the manner of breeding these birds, and many people have made it a

trade by which they have acquired considerable gain. The Tyrolese are said to have carried it to the greatest extent: although the canary birds which are now most common in England, are principally bred in the neighbourhood of Gottingen.

The canary-seed which forms its ordinary food, is said to have been first brought from the Canary Islands to Spain. It was next planted in the southern parts of France: and is now encouraged in different parts of England. Considerable quantities, however, are brought in the way of trade, from Sicily, where it was introduced very early.

COACHES.

THE use of coaches has been carried by many writers much higher than is authorized by facts. Vehicles, approaching them in form, though under a variety of designations, have certainly been used at different times in different countries. But we are expressly informed by Stow in his "Summary of the English Chronicles," that in 1555 Walter Ripon made a coach for the Earl of Rutland, "*which was the first that was ever used in England.*"

In his larger Chronicle, however, he states, that coaches were brought more generally into fashion by one William Boonen, a Dutchman, in 1564, who

was coachman to the Queen. " And
" after a while (he adds) divers great
" ladies, with as great jealousy of the
" Queen's displeasure, made them
" coaches, and rid in them up and
" down the countries, to the great ad-
" miration of all the beholders; but
" then, by little and little, they grew
" usual among the nobility, and others
" of sort, and within twenty years be-
" came a great trade of coach-making."
It was not till the beginning of the
seventeenth century that a coach-box
was added to the body.

In 1605 coaches began to be in
pretty general use among the nobility
and gentry in London: though hack-
ney coaches and stage coaches to and
from the country were still unknown.

Hackney coaches began to ply in
London streets in 1625, when twenty

only was the number allowed; but within ten years their numbers became so multiplied that their increase was restrained by order of council. In 1637, fifty coaches were allowed to be licensed by the master of the horse. In 1652 we find them increased to 200. In 1661 to 500. In 1694 to 700. Afterwards to 800. In 1771 to 1000: and since to 1100.

Stage coaches were not in general use till the beginning of the eighteenth century.

Post chaises were introduced by Mr. Tull, son to the well-known writer on Husbandry.

LOTTERIES.

THE design of lotteries and the manner of drawing them are too well known among us to need description. It is, perhaps, sufficient to say they have been common in other countries as well as England.

The first lottery in England, of which we have any account, was drawn at the west door of St. Paul's cathedral, in the year 1569, and consisted of forty thousand lots, at ten shillings each lot; the prizes were plate; and the profits were to be applied towards repairing the havens of the kingdom. At this time there were only three lottery offices in London.

In 1612, King James appointed another lottery to be held at the west end of St. Paul's, in which the chief prize consisted of the worth of 4000 crowns, in plate; the profits of which were allotted to carry on the settlement of Virginia. Another was licensed in 1630, to enable the adventurers to bring the New River to London.

In 1698, however, lottery having multiplied upon lottery, the system became a public grievance, and was of course prohibited. Our national lotteries are always regulated by act of parliament.

TOBACCO.

TOBACCO was not known in Europe till after the discovery of America by the Spaniards, about 1520. The Americans of the Continent called it *Petun*; those of the Islands, *Yoli*. The Spaniards, who gave it the name of TOBACCO, took it from Tabaco, a province of Yucatan, where they first found it and learned its use.

Jean Nicot, ambassador of Francis the Second, and afterwards of Sebastian, King of Portugal, presented this plant to the grand prior of France, at his arrival from Lisbon in 1561, and to Catharine de Medicis, who called it *La Nicotiane*.

It is generally supposed that the first tobacco ever seen in England was brought from Virginia by Sir Walter Raleigh in 1585; but Camden, the historian, says, it was introduced the next year by Mr. Ralph Lane, who came with Sir Francis Drake on his return from the expedition against the Spanish settlements.

Taking tobacco, however, was much ridiculed by the men of fashion in the reign of James the First, and the courtiers affected to reject it with horror. Even the King himself wrote a pamphlet against it. But the virtues of the herb were described as so numerous, and the fashion of smoking it was so predominant, that tobacco-houses became as common in London as wine-taverns.

Our countryman, Dr. Willis, in his

Treatise on the Plague, giving an account of that of London in 1665, expressly says that the virtues of tobacco were found so great, that during that whole sickness it was observed that no tobacconist's house was infected. Nor, indeed, those who smoked tobacco; especially if they used it in a morning. He cites the words also of Diemerbroek, an eminent physician at Nimeguen, who, being several times affected while administering to the sick in 1636, by smoking tobacco was cured.

The success of the tobacco trade induced several attempts to naturalize the herb in England, where it appears to have been first planted at Winchcomb, in Gloucestershire, early in the reign of James the First. But its cultivation was afterwards restrained by act of parliament in the thirteenth of Charles I.

The pamphlets which were from time to time written against and in defence of it, not only in English, but in French, Latin, Flemish, German, and Italian, were innumerable.

DYEING.

THAT the people of this country were not unacquainted with the art of dyeing wool, yarn, and cloth, of different colours, at a very early period, will need no proof here.

The art of dyeing the scarlet colour, however, by the help of a small insect of the kermes or cochineal kind, appears to have been discovered about A. D. 1000.

By an act of parliament passed in 1581 for abolishing certain deceitful stuff used in dyeing cloth, we find *logwood*, or *blockwood*, of late years brought into this "realm," expressly prohibited; "the colours thereof being

“ false and deceitful to the Queen’s
“ subjects at home, and discreditable
“ beyond sea to our merchants and
“ dyers.” Its use was again prohibited
in 1597, as well as in the reign of
James. But in 1661 the different laws
prohibiting its use were repealed, it
being found that “ the ingenious indus-
“ try of these times hath taught the
“ dyers of England the art of fixing
“ the colours made of logwood, *alias*
“ blackwood, so as that by experience
“ they are found as lasting and service-
“ able as the colours made with any
“ other sort of dyeing wood.

THE TELESCOPE.

IN or about the year 1590, was the invention of the telescope, or spying-glass discovered, being justly esteemed one of the most useful and excellent discoveries of modern times, though it was, it seems, produced by mere chance. The common account is, that two children of one Janssen, a spectacle-maker of Middleburg in Zealand, being at play in their father's shop, and looking through two pieces of glass between their fingers, which were at some small distance from each other, the weather-cock of the church steeple appeared to them unusually large, and much nearer. Of this they instantly told their father,

who, surprised also at first, made the experiment of fixing two such pieces of glass in brazen circles or cylinders, so as they might be placed nearer or farther at pleasure. Janssen very soon improved this discovery so much, that he presented a telescope, twelve inches long, to prince Maurice, and another to the archduke Albert. Prince Maurice, it is also said, conjecturing the discovery might be made of great use in war, desired the secret might be concealed; and had nearly deprived Janssen of the honour of inventing it; the great Des Cartes attributing the invention to one Metius of Alcmaer.

None of the first telescopes, however, appear to have been properly framed for astronomical observations, until Galileo, astronomer to the grand-duke of Tuscany, hearing of this discovery for

bringing objects nearer, made such great improvements therein as gained him, in the opinion of many, the honour of the invention itself, by giving the telescope the appellation of Galileo's tube.

Sir Isaac Newton was the inventor of the *reflecting* TELESCOPE: which is considered as much more exact and useful than the common or refracting ones. He completed two small ones in the year 1672.

The *achromatic* TELESCOPE was the invention of Mr. Peter Dollond.

FORKS.

THE vulgar proverb, that “fingers were made before *forks*,” has perhaps a more curious meaning than the generality of readers might suppose.

Forks for the table have not been invented much more than two hundred years. In early times they were not known even at the entertainments of a sovereign; but the guest who sat nearest to a joint held one part with his fingers while he carved the other with his knife.

They appear to have had their origin in Italy; and to have been introduced into this country either in the

latter end of Queen Elizabeth's reign,
or in the beginning of the reign of
James the First.

They were not very common till after
the Restoration.

THE MICROSCOPE.

WHEN, and by whom, microscopes were first invented, is not certainly known. Huygens tells us, that one Drebell, a Dutchman, had the first microscope, in the year 1621, and that he was reputed the inventor of it: though F. Fontana, a Neapolitan, in 1646, claims the invention to himself, but dates it from the year 1608. As a telescope inverted is a microscope, the discovery might easily enough have arisen from thence.

Nothing is more certain, concerning microscopes, than that they were used in Germany about the year 1621. According to Borellus, they were invented

by Zacharias Janssen, in conjunction with his son, who presented the first microscopes they had constructed to Prince Maurice, and Albert, archduke of Austria. William Borell, who gives this account, in a letter to his brother Peter, says, that when he was ambassador in England, in 1619, Cornelius Drebell shewed him a microscope, which, he said, was the same that the archduke had given him, and had been made by Janssen himself.

SEDAN CHAIRS.

MR. LYSONS, in his work intituled, "Magna Britannia," speaking of the family of Duncombe at Battlesden, in Berkshire, says, "it was to one of this family, Sir Saunders Duncombe, a gentleman pensioner to King James and Charles I. that we are indebted for the accommodation of sedans, or close chairs; the use of which was first introduced by him in this country in the year 1634, when he procured a patent, which vested in him and his heirs the sole right of carrying persons "up and down in them" for a certain term. It is probable that Sir Saunders, who was a great traveller, had seen them at

Sedan, where Dr. Johnson supposes they were first made. It is remarkable, that Captain Bayley first introduced the use of hackney coaches in London the same year.

GAZETTES OR NEWSPAPERS.

M. DE SAINTFOIX, in his Historical Essays on Paris gives this account of their introduction.

Theophrastus Renaudot, a physician of Paris, picked up news from all quarters to amuse his patients; he presently became more in request than any of his brethren ; but as a whole city is not ill, or at least don't imagine itself to be so, he began to reflect, at the end of some years, that he might gain a more considerable income by giving a paper every week, containing the news of different countries. A permission was necessary; he obtained it, with an exclusive privilege, in 1632.

Such papers had been in use for a considerable time at Venice, and were called gazettes, because a small piece of money, called gazetta, was paid for the reading of them.

This is the origin of our gazette, and its name. About ten years afterwards they were common in England by the name of mercuries.

COFFEE.

THE history of coffee, as we gather the account of it from different writers, is curious.

Its first use, as a beverage, is ascribed by some to the prior of a monastery, who being informed by a goat-herd that his cattle, sometimes browsing on the tree, would wake and caper all night, became anxious to prove its virtue, by trying it on his monks to prevent their sleeping at matins.

Others ascribe the invention of it to the Persians, from whom they say it was learnt in the fifteenth century, by the Mufti of Aden, a city near the mouth of the Red Sea, who recommend-

ed it first to his Dervises. From Aden it is said to have passed to Mecca, where it was taken by the devotees; and afterwards to Cairo in Egypt.

In 1511 Khaie Beg prohibited it, from a persuasion that it inebriated; but Sultan Cason, immediately after, took off the prohibition; and coffee advanced from Egypt to Syria and Constantinople, where it is now held to be one of the necessities with which the Turks are obliged to furnish their wives.

Thevenot, the traveller, was the first person who carried it into France.

Purchas, an English writer of the time of James the First, who published a collection of voyages under the title of "The Pilgrims," gives us an account of coffee before it had been introduced to Europe. He says "the

Turks have coffee-houses more common than ale-houses with us ; in or near to which, on benches in the street, they will sit chatting most of the day, drinking their *coffa*, so called of a berry it is made of, as hot as they can endure it. It is black as soot, and tastes not much unlike it ; good, they say, for digestion and mirth.

A Greek servant called Pesqua, brought into England by Mr. Daniel Edwards, a Turkish merchant, in 1652, to make his coffee, is stated by some to have first set up the profession of a coffee-man, and, in fact, to have introduced the drink among us. But if Dr. Harvey did not recommend the use of it considerably earlier, it is well known that the first coffee-house was set up by one Jobson, a Jew at Oxford, in 1650. Arthur Tillyard, an apothecary in Lon-

don, sold it publicly in his own house in 1655. And in 1671 the drink became so general, that Jobson, the Jew, removed his shop to the metropolis.

THE STEAM-ENGINE.

THE invention of the steam-engine is reckoned one of the best presents which the arts of life have ever received from the philosopher. For the generality of inventions we have been much indebted to chance: but the steam-engine, at its very beginning, was the result of reflection, and every improvement and alteration it has subsequently received, have been likewise the results of philosophical study.

The steam-engine was, beyond all doubt, invented by the Marquis of Worcester, very early in the reign of Charles II. This nobleman, in 1663, in a work intitled "A Century of Inventions," gave

an obscure and enigmatical account of various discoveries and contrivances which he had made: courting, but from a variety of reasons not receiving, public encouragement. Among his "Inventions," without affording a distinct notion of its structure, he describes with great accuracy the force and operation of certain steam-vessels which he had constructed. His first experiments appear to have been made upon a cannon, which, having filled to the height of three-fourths with water, and shut up its muzzle and touch-hole, he exposed to the action of fire for twenty-four hours, when it burst with a great explosion, and afforded him proof, that the expansive force of steam was greater than any other person had suspected. "Having afterwards," he adds, "discovered

“ a method of fortifying vessels inter-
“ nally, and combined them in such a
“ way that they filled and acted alter-
“ nately, I have made the Water spout
“ in an uninterrupted stream forty feet
“ high; and one vessel of rarefied water
“ raised forty of cold water.”

It was not, however, till toward the close of the century when experimental philosophy was prosecuted with uncommon ardour, that the Marquis's notions were attended to.

Captain Savary, a man of great mechanical ingenuity, saw the reality and practicability of the project. He knew experimentally the great power of steam, and had also discovered the inconceivable rapidity with which it was reconverted into water by cold; and he contrived a machine for raising water in which *both these properties were employed.* This was about 1693.

The Marquis of Worcester and Savary were thus both inventors of the steam-engine.

The account in the "Century of Inventions," was sufficient to instruct any person who had the smallest knowledge of the properties of steam. While Captain Savary's, who obtained a patent *after having actually erected several machines*, had likewise an independant claim to originality.

The French claim the discovery for a Dr. Papin, as early as 1695. But the truth is, that gentleman's more useful experiments were not made till long afterward, and in the end he proved himself but of little consideration either as a philosopher or a mechanician.

The first application of Savary's engine was in the tin mines of Cornwall.

Of the subsequent improvers, the

most successful have been, Mr. Newcomen, Mr. Keene Fitzgerald, Mr. Hornblower, and Messrs. Watt and Boulton, the last of whom were at one time in treaty with the states of Holland, not only for draining the Haerlem Meer, by the force of their engines, but for reducing even the Zuyder Zee.

THE MAGIC LANTHORN.

THE magic lantorn, or at least the principle upon which it is constructed, is said to have been known to Roger Bacon, whose acquaintance with philosophy was, once, deeper than is generally imagined.

The real inventor, however, was Kepler, the astronomer, who appears to have made one in 1665.

BAYONETS.

THE first bayonets were daggers, which, after the soldiers had exhausted their ammunition, they fitted to the bore of their muskets.

They were introduced into France about 1673; and among the English grenadiers in the short reign of James the Second. Many such are yet to be seen in the small armory at the Tower. The use of them, fastened to the muzzle of the firelock, was also a French improvement, first adopted about 1690; it was accompanied, in 1693, at the battle of Marseille in Piedmont, by a dreadful slaughter; and its use was universally followed by the rest of Europe in the war of the Succession.

MAHOGANY.

MAHOGANY is a species of cedar, and a native of the warmest parts of America; growing plentifully in the islands of Cuba, Jamaica, and Hispaniola, as well as the Bahamas.

The first use to which mahogany was applied in England, was to make a box for holding candles. Dr. Gibbons, an eminent physician in the latter end of the seventeenth century, had a brother a West India captain, who brought over some planks of this wood as ballast. As the Doctor was then building himself a house in King-street, Covent-garden, his brother thought they might be of service to him. But the carpenters, finding the wood too hard for their tools, they were laid aside for a

time as useless. Soon after, Mrs. Gibbons wanting a candle-box, the Doctor called on his cabinet-maker (Wollaston, of Long Acre) to make him one of some wood that lay in his garden. Wollaston also complained that it was too hard. The Doctor said he must get stronger tools. The candle-box was made and approved; insomuch, that the Doctor then insisted on having a bureau made of the same wood, which was accordingly done; and the fine colour, polish, &c. were so pleasing, that he invited all his friends to come and see it. Among them was the Duchess of Buckingham. Her Grace begged some of the same wood of Dr. Gibbons, and employed Wollaston to make her a bureau also; on which the fame of mahogany and Mr. Wollaston was much raised, and things of this sort became general.

T E A.

TEA was introduced into Europe in 1610 by the Dutch East India Company. Dr. Johnson says it was first imported into this country from Holland, by the Earls of Arlington and Ossory, in 1666 ; from whose ladies the women of quality are said to have learned its use. But it was used in coffee-houses before this period, as appears from an act of parliament made in 1660, in which a duty of 8*d.* was laid on every gallon of the infusion sold at these places. In 1666 it was sold in London, according to Dr. Johnson, at sixty shillings the pound, though it did not cost more than 2*s.* 6*d.* or 3*s.* 6*d.* at

Batavia. It continued at this price till 1707. In 1715, green tea began to be used ; and as great quantities were then imported, the price was lessened, and the practice of drinking tea descended even to the lower ranks.

MACHINE FOR NOTING DOWN MUSIC.

It appears incontestible, says Mr. Beckman, that a proposal for inventing such a machine, as is above mentioned, was made known by an Englishman. In the month of March, 1747, John Frake transmitted to the Royal Society a paper, written by a clergyman of the name of Creed, which was printed in the Philosophical Transactions under the following title: " Demonstration of the possibility of making a Machine that shall write extempore voluntaries, or other pieces of Music, as fast as any master shall be able to play them upon an organ, harpsichord, &c. and that in a

character more natural, more intelligible, and more expressive of all the varieties those instruments are capable of exhibiting, than the character now in use." The author of this paper, however, points out the possibility of making such a machine, without giving instructions how to construct it.

In the year 1745, John Frederic Unger, then land-bailiff and burgomaster of Eiabec, and who had made himself known by several learned works, fell upon the same invention without the smallest knowledge of the idea published in England. This invention, however, owing to the variety of his occupations, he is said not to have made known till the year 1752, when he transmitted a short account of it, accompanied with figures, to the Academy of Sciences at Berlin. The

Academy highly approved of it, and it was soon celebrated in several gazettes but a description of it was never printed.

A few days after Euler had read this paper of Mr. Unger's before the Academy, Mr. Sulzer informed one Hohlfeld of the invention, and advised him to exert his ingenuity in constructing such a machine, which Mr. Unger himself had not been able to execute through want of an artist capable of following his ideas.

Unger's own description of his invention was printed, with copper plates, at Brunswick, in the year 1774, together with the correspondence between him and Euler, and other documents. A description of Hohlfeld's machine, illustrated with figures, was published after his death by Mr. Sulzer, in the New

Memoirs of the Academy at Berlin, under the title of “ Description of a Machine for noting down pieces of Music as fast as they are played upon the Harpsichord.” Sulzer there remarks, that Hohlfeld had not followed the plan sketched out by Mr. Unger, and that the two machines differed in this, that Unger’s formed one piece with a particular harpsichord, while that of Hohlfeld could be applied to any harpsichord whatever.

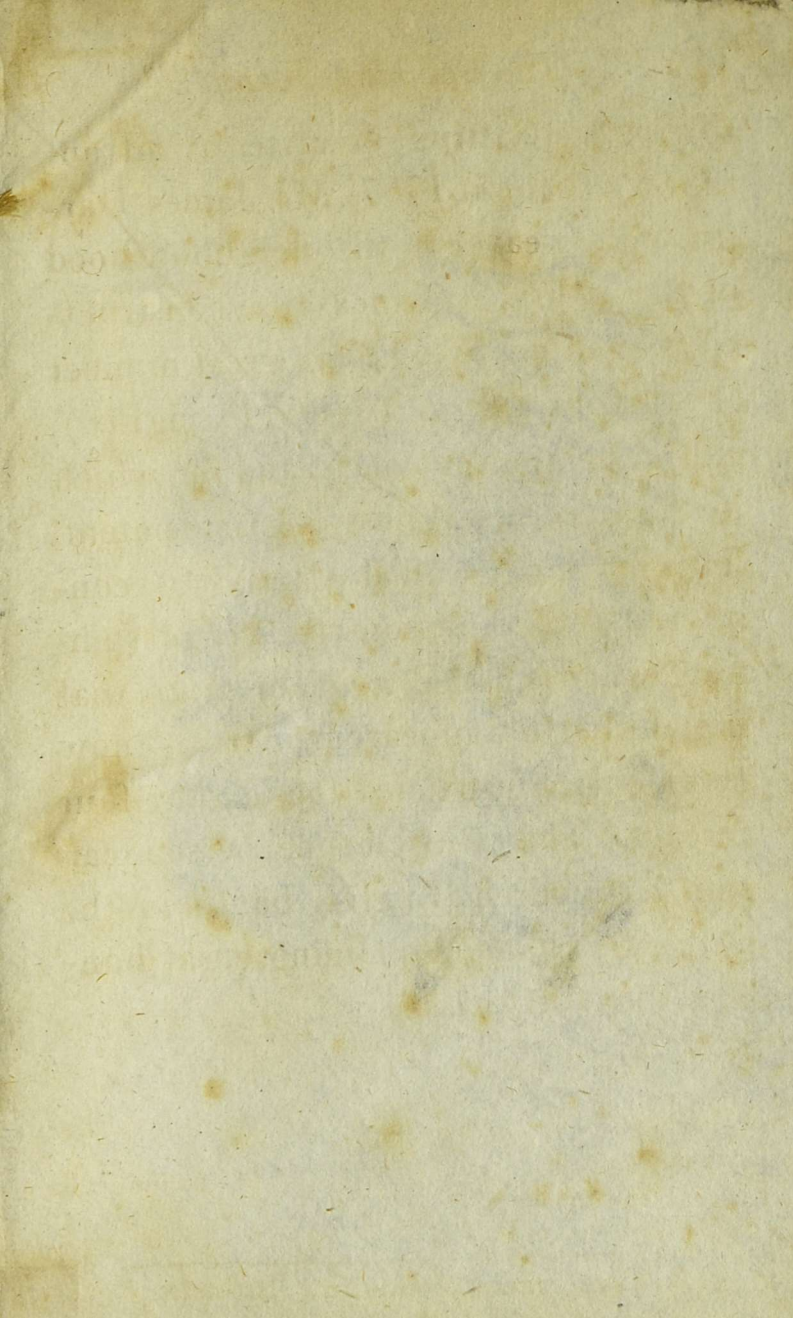
THE SPINNING-JENNY.

The art or process of reducing cotton-wool into yarn or thread, was for so long a series of years performed by the hand, upon the machine which is called the *one-thread-wheel*, that for the origin of that instrument we might possibly search in vain. The demand for cotton-goods increased so rapidly during the last century ; that the necessity of some invention which might expedite this part of the manufacture seemed obvious.

In the reign of George the Second several machines were constructed by different persons for facilitating the spinning of cotton ; but without pro-

ducing any lasting or material advantage: till about 1767, Mr. James Hargrave, a weaver in the neighbourhood of Blackburn, in Lancashire, constructed a machine, by which a great number of threads (from twenty to eighty), might be spun at once, and for which he obtained his Majesty's letters patent. This machine, called A JENNY, is considered as the best contrivance for spinning what is called *woof*, or *shute*, that has hitherto appeared. It is now commonly constructed for eighty-four threads; and with it one person can spin a hundred English hanks in the day, each hank containing eight hundred and forty yards.

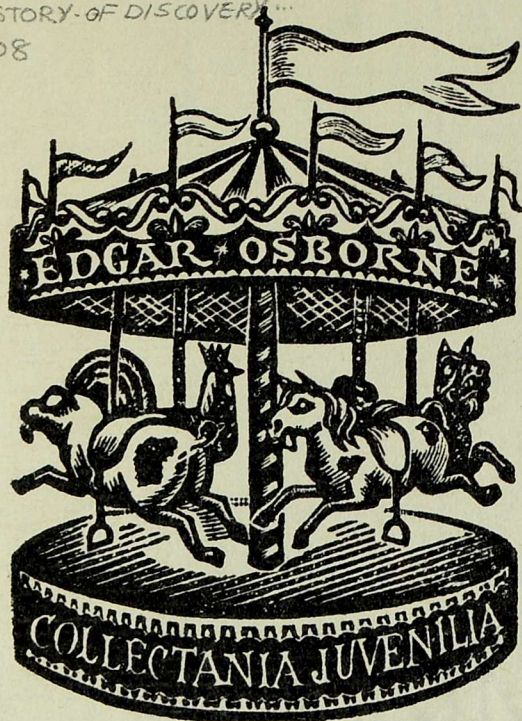
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HISTORY OF DISCOVERY...

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