(1.) * SILK. *n. ſ.* [*ſeolc*, Sax.] The thread of the worm that turns afterwards to a butterfly.—

The worms are hallow'd that did breed the *ſilk*; *Shak.*

2. The ſtuff made of the worms thread.—Let not the creaking of ſhoes, or ruſtling of *ſilks* betray thy poor heart to woman. *Shak.*—He cauſed the ſhore to be covered with Perſian *ſilk* for him to tread upon. *Knolles.*—

Without

Without the worm, in Perſian *ſilks* we ſhine.
Waller.

(2.) SILK is a very ſoft, fine, bright thread, the work of an inſect called BOMBYX, or the ſilk-worm.

(3.) SILK, ANCIENT OPINIONS RESPECTING. The firſt of the Roman writers extant by whom ſilk is mentioned, are Virgil and Horace; but it is probable that neither of them knew from what country it was obtained, nor how it was produced. By ſome of the ancients it was ſuppoſed to be a fine down adhering to the leaves of certain trees or flowers. Others imagined it to be a delicate ſpecies of wool or cotton; and even thoſe who had learned that it was the work of an inſect, ſhow by their deſcriptions that they had no diſtinct idea of the manner in which it was formed.

(4.) SILK, HISTORY OF THE TRADE IN. As the ſilk worm is a native of China, the culture of ſilk in ancient times was entirely confined to that country. We are told that the empreſſes, ſurrounded by their women, ſpent their leiſure hours in hatching and rearing ſilk worms, and in weaving tiſſues and ſilk veils. That this example was ſoon imitated by perſons of all ranks, we have reaſon to conclude; for we are informed that the Chineſe, who were formerly clothed in ſkins, in a ſhort time after were dreſſed in veſtments of ſilk. Till the reign of Juſtinian, the ſilk worm was unknown beyond the territories of China, but ſilk was introduced into Perſia long before that period. After the conqueſt of the Perſian empire by Alexander the Great, this valuable commodity was brought into Greece, and thence conveyed to Rome. Among the Romans ſilk was deemed a dreſs too expenſive and too delicate for men, and was appropriated wholly to women of eminent rank and opulence. Heliogabalus is ſaid to have been the firſt man among the Romans who wore a garment of fine ſilk: Aurelian complained that a pound of ſilk was ſold at Rome for 12 ounces of gold; and it is ſaid he refuſed to give his wife permiſſion to wear it on account of its exorbitant price. For ſeveral centuries the Perſians ſupplied the Roman empire with the ſilks of China. Caravans traverſed the whole latitude of Aſia, in 243 days, from the Chineſe ocean to the ſea-coaſt of Syria, carrying this commodity. Sometimes it was conveyed to the ports of Guzerat and Malabar, and thence tranſported by ſea to the Perſian gulph. The Perſians, with the uſual rapacity of monopoliſts, raiſed the price of ſilk to ſuch an exorbitant height, that Juſtinian, eager not only to obtain a full and certain ſupply of a commodity which was become of indiſpenſable uſe, but ſolicitous to deliver the commerce of his ſubjects from the exactions of his enemies, endeavoured, by means of his ally, the Chriſtian monarch of Abyſſinia, to wreſt ſome portion of the ſilk trade from the Perſians. In this attempt he failed; but when he leaſt expected it, he, by an unforeſeen event, attained, in ſome meaſure, the object which he had in view. Two Perſian monks having been employed as miſſionaries in ſome of the Chriſtian churches, which were eſtabliſhed (as we are informed by Coſmas) in different parts of India, had penetrated into the country of the SERES, or China. There they obſerved the labours of the ſilk worm, and became acquainted with all the arts of man in working up its productions into ſuch a variety of elegant fabrics. The proſpect of gain, or perhaps an indignant zeal, excited by ſeeing this lucrative branch of commerce engroſſed by unbelieving nations, prompted them to repair to Conſtantinople. There they explained to the emperor the origin of ſilk, as well as the various modes of preparing and manufacturing it, myſteries hitherto unknown, or very imperfectly underſtood in Europe; and encouraged by his liberal promiſes, they undertook to bring to the capital a ſufficient number of thoſe wonderful inſects, to whoſe labours man is ſo much indebted. This they accompliſhed, by conveying the eggs of the ſilk worm in a hollow cane. They were hatched by the heat of a dung-hill, fed with the leaves of a wild mulberry tree, and they multiplied and worked in the ſame manner as in thoſe climates where they firſt became objects of human attention and care. Vaſt numbers of theſe inſects were ſoon reared in different parts of Greece, particularly in the Peloponneſus. Sicily afterwards undertook to breed ſilk worms with equal ſucceſs, and was imitated from time to time, in ſeveral towns of Italy. In all theſe places extenſive manufactures were eſtabliſhed and carried on with ſilk of domeſtic production. The demand for ſilk from the eaſt diminiſhed of courſe, the ſubjects of the Greek emperors were no longer obliged to have recourſe to the Perſians for a ſupply of it, and a conſiderable change took place in the nature of the commercial intercourſe between Europe and India.

(5.) SILK, METHOD OF BREEDING THE WORMS FOR PRODUCING. As ſilk is the production of a worm, it is firſt neceſſary to deſcribe its nature and mode of manufacturing. But before we give any account of the moſt approved methods of managing ſilk-worms in Europe, it will be proper to preſent a ſhort deſcription of the methods practiſed in China, the original country of the ſilk-worm. Theſe are two: they either permit them to remain at liberty on mulberry trees, or keep them in rooms. As the fineſt ſilk is produced by worms confined in rooms, and as the firſt method is very ſimple, it will ſuffice to deſcribe the ſecond. The eggs are laid on large ſheets of paper, to which they firmly adhere. The ſheets are hung up on a beam of the room, with the eggs inward, and the windows are opened in the front to admit the wind; but no *hempen ropes* muſt ever come near the worms or their eggs. After ſome days the ſheets are taken down, rolled up looſely with the eggs inward, and then hung up again, during the ſummer and autumn. At the end of Dec. or the beginning of Jan. the eggs are put into cold water, with a little ſalt diſſolved in it. Two days after they take them out, hang them up again, and when dry roll them a little tighter, and encloſe each ſeparately, ſtanding on one end in an earthen veſſel. Some put them into a lye made of mulberry tree aſhes, and then lay them ſome moments in ſnow-water, or elſe hang them up three nights on a mulberry tree to receive the ſnow or rain, if not too violent. The time of hatching them is when the leaves of the mulberry trees

trees begin to open, for they are haſtened or impeded according to the different degrees of heat or cold. When they are ready to come forth, the eggs ſwell, and become a little pointed. The 3d day before they are hatched, the rolls of paper are taken out of the veſſel, ſtretched out, and hung up with their backs toward the ſun, till they receive a kindly warmth; and then being rolled up cloſe, they are ſet upright in a veſſel in a warm place. This is repeated the next day, and the eggs change to an aſh-grey. They then put two ſheets together, and rolling them cloſe tie the ends. The 3d day towards night, the ſheets are unrolled and ſtretched on a fine mat, when the eggs appear blackiſh. They then roll 3 ſheets together, and carry them into a pretty warm place, ſheltered from the wind. The next day the people taking out the rolls, and opening them, find them full of worms like ſmall black ants. The apartment choſen for ſilk-worms is on a dry ground, in a pure air, and free from noiſe. The rooms are ſquare, and very cloſe, for the ſake of warmth; the door faces the ſouth, and is covered with a double mat, to keep out the cold; yet there ſhould be a window on every ſide, that when it is thought neceſſary the air may have a free paſſage. In opening a window to let in a refreſhing breeze, care muſt be taken to keep out the gnats and flies. The room muſt be furniſhed with 9 or 10 rows of frames, about 9 inches one above the other. On theſe they place ruſh hurdles, upon which the worms are fed till they are ready to ſpin: and, to preſerve a regular heat, ſtove fires are placed at the corners of the room, or elſe a warming pan is carried up and down it: but it muſt not have the leaſt flame or ſmoke. Cow-dung dried in the ſun is eſteemed the moſt proper fuel. The worms eat equally day and night. The Chineſe give them on the firſt day 48 meals, that is one every half hour; the next 30; the 3d day ſtill leſs. As cloudy and rainy weather leſſens their appetite, juſt before their repaſt a wiſp of very dry ſtraw, the flame of which muſt be all alike, is held over the worms to free them from the cold and moiſture that benumbs them, or the blinds are taken from the windows to let in the full day-light. Eating ſo often haſtens their growth, on which the chief profit of the ſilk worm depends. If they come to maturity in 23 or 25 days, a large ſheet of paper covered with worms, which at their firſt coming from the eggs weigh little more than a drachm, will produce 25 ounces of ſilk; but if not till 28 days, they then yield only 20 ounces; and if they are a month or 40 days in growing, they then produce but ten. They are kept extremely clean, and are often removed; and when they are pretty well grown, the worms belonging to one hurdle are divided into three, afterwards they are placed on ſix, and ſo on to the number of 20 or more; for being full of humours, they muſt be kept at a due diſtance from each other. The critical moment for removing them is when they are of a bright yellow and ready to ſpin; they muſt be ſurrounded with mats at a ſmall diſtance, which muſt cover the top of the place to keep off the outward air; and becauſe they love to work in the dark. However, after the 3d day's labour, the mats are taken away from one o'clock till three, but the rays of the ſun muſt not ſhine upon them. They are at this time covered with the ſheets of paper that were uſed on the hurdles. The cocoons are completed in 7 days, after which the worm is metamorphoſed into a chryſalis; the cocoons are then gathered, and laid in heaps, having firſt ſet apart thoſe deſigned for propagation upon a hurdle, in a cool airy place. The next care is to kill the moths in thoſe cones which are not to be bored. The beſt way of doing this is to fill large earthen veſſels with cones in layers of 10 lb. each, throwing in 4 oz. of ſalt with every layer, and covering it with large dry leaves like thoſe of the water lily, and cloſely ſtopping the mouth of the veſſels. But in laying the cones into the veſſels, they ſeparate the long, white, and glittering ones, which yield a very fine ſilk, from thoſe that are thick, dark, and of the colour of the ſkin of an onion, which produce a coarſer ſilk. The SILK-WORM is a ſpecies of caterpillar, which, like all others of the ſame claſs, undergoes a variety of changes, that, to perſons who are not acquainted with objects of this kind, will appear to be not a little ſurpriſing. It is produced from a yellowiſh coloured egg, about the ſize of a ſmall pin head, which has been laid by a kind of greyiſh coloured moth, which the vulgar confound with the butterfly. Theſe eggs, in the temperature of this climate, if kept beyond the reach of the fire and ſun ſhine, may be preſerved during the whole of the winter and ſpring without danger of hatching: and even in ſummer they may eaſily be prevented from hatching if they be kept in a cool place; but in warmer climates it is ſcarcely poſſible to preſerve them from hatching, even for a few days, or from drying ſo much as to deſtroy them. Hence it is eaſy for a native of Britain to keep the eggs till the food on which the worm is to feed be ready for that purpoſe. When this food is in perfection, the eggs need only be expoſed to the ſun for a day or two, when they will be hatched with great facility. When the animal is firſt protruded from the egg, it is a ſmall black worm, which is active, and naturally aſcends to the top of the heap in ſearch of food. At this ſtage of his growth the ſilk-worm requires to be fed with the youngeſt and moſt tender leaves. On theſe leaves, if good, he will feed very freely for about 8 days, during which period he increaſes in ſize to about a quarter of an inch in length. He is then attacked with his firſt ſickneſs, which conſiſts in a kind of lethargic ſleep for about 3 days; during which time he refuſes to eat, and changes his ſkin, preſerving the ſame bulk. This ſleep being over, he begins to eat again, during five days, at which term he is grown to the ſize of full half an inch in length; after which follows a ſecond ſickneſs in every reſpect like the former. He then feeds for other five days; during which time he will have increaſed to about three quarters of an inch in length, when he is attacked with his third ſickneſs. This being over, he begins to eat again, and continues to do ſo for five days more, when he is attacked by his 4th ſickneſs, at which time he is arrived at his full growth. When he recovers this ſickneſs, he feeds once more during five days with a moſt voracious appetite; after

ter which he diſdains his food, becomes tranſparent, a little on the yellowiſh caſt, and leaves his ſilky traces on the leaves where he paſſes. Theſe ſigns denote that he is ready to begin his cocoon, and will eat no more. Thus it appears that the whole duration of the life of the worm, in this ſtate of its exiſtence, in our climate, is uſually about 46 days; 28 of which days he takes food, and remains in his ſick or torpid ſtate 18; but during the warm weather the periods of ſickneſs are ſhortened, and in cold weather lengthened, above the terms here ſpecified. In very hot climates it may be ſaid to live faſter, and ſooner to attain maturity, than in thoſe that are colder. Dr Anderſon informs us, that at Madras the worm undergoes its whole evolutions in the ſpace of 22 days. It appears, however, that it feeds fully as many days in India as in Europe, the difference being entirely occaſioned by ſhortening the period of ſickneſs. The longeſt ſickneſs he had ſeen them experience there did not exceed two days; and during ſummer it only laſts a few hours. When the worm has attained its full growth, it ſearches about for a convenient place for forming its cocoon, and mounts upon any branches or twigs that are put in its way for that purpoſe. After about two days ſpent in this manner, it ſettles in its place, and forms the cocoon, by winding the ſilk which it draws from its bowels round itſelf into an oblong roundiſh ball. During this operation it gradually loſes the appearance of a worm; its length is much contracted, and its thickneſs augmented. By the time the web is finiſhed, it is found to be transformed into an oblong roundiſh ball, covered with a ſmooth ſhelly ſkin, and appears to be perfectly dead. In this ſtate of exiſtence it is called an AURELIA. Many animals in this ſtate may be often ſeen ſticking on the walls of out-houſes, ſomewhat reſembling a ſmall bean. In this ſtate it remains for ſeveral days entirely motionleſs in the heart of the cocoon, after which it burſts like an egg hatching, and from that comes forth a heavy dull looking moth with wings; but theſe wings it never uſes for flying; it only crawls ſlowly about in the place where it has been hatched. This creature forces its way through the ſilk covering which, in the worm ſtate, it had woven, goes immediately in queſt of its mate, after which the female lays her eggs; and both male and female, without taſting food in this ſtage of their exiſtence, die in a very ſhort time. The ſilk worm, when at its full ſize, is from an inch and a quarter to an inch and a half in length, and about half an inch in circumference. He is either of a milk or pearl colour, or blackiſh; theſe laſt are eſteemed the beſt. His body is divided into 7 rings, to each of which are joined two very ſhort feet. He has a ſmall point like a thorn exactly above the anus. The ſubſtance which forms the ſilk is in his ſtomach, which is very long, wound up, as it were, upon two ſpindles, as ſome ſay, and ſurrounded with a gum, commonly yellowiſh, ſometimes white, but ſeldom greeniſh. When the worm ſpins his cocoon, he winds off a thread from each of his ſpindles, and joins them afterwards by means of two hooks which are placed in his mouth, ſo that the cocoon is formed of a double thread. Having opened a ſilk worm, you may take out the ſpindles, which are folded up in three plaits, and, on ſtretching them out, and drawing each extremity, you may extend them to near two ells in length. If you then ſcrape the thread ſo ſtretched out with your nail, you ſcrape off the gum, which is very like bees wax, and performs the ſame office to the ſilk it covers as gold leaf does to the ingot of ſilver it ſurrounds, when drawn out by the wire drawer. This thread, which is extremely ſtrong and even, is about the thickneſs of a middling pin. Of ſilk worms, as of moſt other animals, there is a conſiderable variety of breeds, ſome of which are much more hardy, and poſſeſs qualities conſiderably different from others. This is a particular of much importance to be adverted to at the time of beginning to breed theſe creatures in any place; for it will make a great difference in the profit on the whole to the undertaker if he rears a good or a bad ſort. As the ſucceſs of the ſilk manufacture muſt depend on the breed of worms, it is of great conſequence to bring them from thoſe countries where they are reckoned beſt. Mr Andrew Wright, an ingenious ſilk manufacturer of Paiſley, has given the following directions for conveying the eggs of the ſilk worm from diſtant countries by ſea: As ſoon as the moth has laid her eggs, dry them immediately, and put them into glaſs vials; ſeal them ſo cloſe that damp air or water will not penetrate into them. Put theſe phials that contain the eggs into earthen pots filled with cold water; and as often as the water becomes warm renew it. Place the earthen veſſels in the coldeſt place of the ſhip, and let them remain until the end of the voyage. The ſhip choſen for this purpoſe ought to be one that would arrive in Britain in June or July. This is a department in reſpect to the economy of animals that has been in every caſe much leſs adverted to than it deſerves; and in particular with regard to the ſilk-worm it has been almoſt entirely overlooked. A few eggs of the ſilk-worm can be eaſily tranſported by poſt in a letter from any part of Europe to another, eſpecially during the winter ſeaſon. It would therefore be an eaſy matter for any patriotic ſociety, ſuch as the Society of Arts in London, to obtain a ſpecimen of the eggs from every country in which ſilk is now reared, to put theſe under the care of a perſon who could be depended upon, and who underſtood the management of them, with orders to keep each kind diſtinct from another, and advert to every particular that occurred in their management, ſo as to make a fair eſtimate of their reſpective merits. By theſe means the beſt might be ſelected, and thoſe of inferior value rejected: 40 or 50 of each ſort might be enough for the experiment; but it ought to be repeated ſeveral times before concluſions could be drawn to be altogether relied upon. From the above particulars, it is evident, that the management of ſilk-worms muſt be very different in hot climates from what is required in thoſe that are colder. At Madras, it appears from Dr Anderſon's experiments that it is very difficult to prevent the eggs from hatching for a very few days, ſo that many generations of them muſt be propagated in one year. "In this hotteſt ſeaſon," ſays he, in a letter to Sir Joſeph Banks, dated July 6. 1795, "the ſhorteſt time I have been able to remark

mark for the whole evolutions of the ſilk worm is 40 days; that is to ſay, ſix days an egg, 22 a worm, 11 a grub in the cocoon, and one a moth or butterfly." Fortunately, where the climate forces forward their production ſo rapidly, nature hath been equally provident of food for their ſubſiſtence; for in theſe regions the mulberry continues to grow and puſh out leaves the whole year.

(6.) SILK, METHOD OF BREEDING THE WORMS FOR, IN TEMPERATE CLIMATES. Though the ſilk worm be a native of China, there is no doubt but it might be eaſily propagated perhaps in moſt parts of the temperate zones. The eggs of this inſect, indeed, require a conſiderable degree of warmth to hatch them, but they can alſo endure a ſevere froſt. No leſs than 5400lbs. of ſilk was raiſed in 1789 in the cold, ſandy territories of Pruſſia. In Pekin, in China, where great quantities of ſilk are fabricated, the winter is much colder than even in Scotland. From the information of ſome Ruſſians who were ſent thither to learn the Chineſe language, we find that Reaumur's thermometer was obſerved from 10° to 15°, and even 20° below the freezing point. Nor is it difficult to rear the food of the ſilk worm in a temperate clime. The mulberry-tree is a hardy vegetable, which bears, without injury, the winters of Sweden, and even of Siberia. Of the 7 ſpecies of the mulberry (ſee MORUS) enumerated by Linnæus, 4, (viz. the white, red, black, and Tartarian,) there is every reaſon to believe could be reared both in Britain and Ireland. The *white* grows in Sweden; the *red* is abundant round Quebec; the *black* delights in bleak ſituations, expoſed to wind on the ſea ſhore; and the *Tartarian* mulberry grows in the chilly regions of Siberia. As to the ſuperior qualities of the different ſpecies, if the firſt three are laid down together, the ſilk worm will firſt eat the white, then the red, and next the black. The Tartarian ſeems to hold as high a place in its eſteem as either the red or black; but the white ſeems to be its natural food. In Calabria the red mulberry is uſed; in Valencia the white; and in Granada, where excellent ſilk is produced, the mulberries are all black. The white ſeems to proſper very well in a moiſt ſtiff ſoil: the black agrees well with a dry, ſandy, or gravelly ſoil and the white is moſt luxuriant in a moiſt rich loam. Britain poſſeſſes ſome advantages in the raiſing of raw ſilk which are not enjoyed by warmer countries. Even in the ſouth of France, Mr Arthur Young ſays, the mulberry leaves are often nipped by froſt in the bud; but this is ſcarcely ever the caſe with us. Thunder and lightning are hurtful to the ſilk worm. Now our climate can boaſt that it is almoſt wholly exempted from thoſe dreadful ſtorms of thunder and lightning which prevail ſo much in hot climates. Nature has then furniſhed us with every thing requiſite for the ſilk manufacture; it remains only for us to improve our advantages. Let mulberry trees be planted by proprietors of lands, and let a few perſons of ſkill and attention devote their time to the raiſing of ſilk worms. This will not interfere with any manufacture already eſtabliſhed: but would afford a reſpectable, lucrative, and agreeable employment for the ladies, or women in general, who have at preſent too few profeſſions to which they can apply. The ſociety inſtituted at London for the encouragement of arts, manufactures, and commerce, much to their honour, have offered premiums to thoſe who ſhall plant a certain number of mulberry trees. The following method of raiſing MULBERRY TREES from ſeed is practiſed in the ſouth of France, and has been repeated with ſucceſs in the Eaſt Indies by Dr Anderſon of Madras. "Take the ripe berries of the mulberry when full of juice and ſeeds. Next take a rough horſe hair line or rope, and with a handful of ripe mulberries run your hand along the line bruiſing the berries and maſhing them as much as poſſible as your hand runs along, ſo that the pulp and ſeeds of the berries may adhere in abundance to the rope or hair line. Next dig a trench in the ground where you wiſh to plant them, much like what is practiſed in kitchen gardens in England for crops of various kinds. Next cut the rope or hair line into lengths according to the length of the trench you think fit to make, and plunge the line full of maſhed berries into the trench, and then cover it over well with earth, always remembering afterwards to water it well, which is eſſential to the ſucceſs. The ſeeds of the berries thus ſown will grow, and ſoon ſhoot out young ſuckers, which will bear young leaves, which are the beſt food for the ſilk worm. The facility and rapidity with which young leaves may by this means be produced is evident, for as many rows of trenches may thus be filled as can be wiſhed; and it can never be neceſſary to have mulberry trees higher than our raſpberries, currants, or gooſeberry buſhes. Whenever they get beyond that, they loſe their value; and if theſe trenches ſucceed, you may have a ſupply coming freſh up day after day, or any quantity you pleaſe." But as mulberry trees are not yet found in abundance in this country, it were to be wiſhed that ſome other food could be ſubſtituted in their place: attempts have accordingly been made by thoſe who have reared ſilk worms, and it has been found poſſible to ſupport the ſilk worm upon lettuce. Miſs Henrietta Rhodes, a lady who has made ſome ſucceſsful experiments on raiſing ſilk worms in England, had found that the ſilk worm could not with ſafety be kept on lettuce for above 3 weeks elſe they died ſpinning a web. This ſhe ſuppoſed was owing to the coldneſs of the lettuce. Gen. Mordaunt having heard of this conjecture, reſolved to try the experiment. He got ſome ſilk worms eggs had them hatched in his hot-houſe, and cauſed them to be all fed upon lettuce and nothing elſe. They proſpered as well as any worms could do, few or none of them died; and they afforded as fine cocoons as if they had been fed upon mulberry leaves. As far as one experiment can go, this affords a very exhilarating proſpect in many points of view. If one kind of food has been noxious, merely on account of an improper temperature, others may be found which have been hurtful only from a ſimilar cauſe; ſo that it is not impoſſible but we may at laſt find that this delicate creature may be ſupported by a variety of kinds of food. Few, however, could be more eaſily obtained than lettuce; and this plant, when cabbaged (the coſs, or ice lettuce eſpecially), would poſſeſs one quality that the mulberry leaf

never can poſſeſs, from the want of which many millions of worms die in thoſe countries where ſilk is now reared; for it is obſerved, that when the leaves are gathered wet, it is ſcarcely poſſible to preſerve the worms alive for any length of time; ſo that during a continuance of rainy weather many of them are unavoidably cut off: but a lettuce when cabbaged, reſiſts moiſture. If gathered, even during rain, the heart of it is dry; ſo that if the outer leaves be thrown aſide at that time, the worms would be continued in perfect health. The expence, too, of cultivating and gathering lettuce, would be ſo much leſs than that of gathering mulberry leaves, as to occaſion a ſaving that would be more than ſufficient to counterbalance the expence of heating the conſervatory. The only point to be aſcertained is, whether it is a fact that worms fed on lettuce, if kept in a due temperature, will continue in good health, in general, till theyperfect their cocoon? To aſcertain this more experiments ſhould be made. It is ſaid that Dr Lodovic Bellardi, a learned and ingenious botaniſt of Turin, has, after a number of experiments, diſcovered a new method of feeding ſilk worms when they are hatched before the mulberry trees have produced leaves, or when it happens that the froſt deſtroys the tender branches. This new method conſiſts in giving the worms dried leaves of the mulberry-tree. Dry as this nouriſhment is, repeated experiments made by our author, prove that they prefer it to any other, and eat it with the greateſt avidity. The mulberry leaves muſt be gathered about the end of autumn, before the froſts commence, in dry weather, when the heat is greateſt. They muſt be dried afterwards in the ſun, by ſpreading them upon large cloths, and laid up in a dry place after they have been reduced to powder. When it is neceſſary to give this powder to the worms, it ſhould be gently moiſtened with a little water, and a thin coat of it muſt be placed around the young worms, which will immediately begin to feed upon it. One perſon, who has had much experience in the managing of ſilk worms, aſſures us, that the ſilk produced from any other food than mulberry leaves is of an inferior quality, and that the worms are ſickly. We ſuſpect that the experiment has not been ſkilfully performed; and therefore, before every other food except mulberry leaves is diſcarded, the experiment ought to be made with great care. Certain it is, that every animal, in its ſtate of nature, partakes of a food peculiar to itſelf, which is rejected by other animals; and it is a curious fact, as well as an admirable inſtance of the care of Divine providence over all his works, that notwithſtanding the numberleſs inſects that prey upon animals and vegetables, the mulberry tree is left untouched by them all, as the excluſive property of the ſilk worm, the chief inſect, which toils and ſpins for the uſe of man.

(7.) SILK: METHOD OF CONSTRUCTING APARTMENTS PROPER FOR REARING THE WORMS. In the opinion of ſome perſons in this country, who have been in the practice of rearing ſilk worms, they ought always to be kept in a dry place, well ſheltered, poſſeſſing a conſiderable degree of warmth, and not expoſed to ſudden tranſitions from heat to cold. If the weather be too cold, a ſmall fire muſt be made, eſpecially when the worms are ready for ſpinning. A ſouthern expoſure is therefore preferable. Some think light is of great utility to ſilk worms, others think that they thrive better in the dark. As to what apartments are beſt accommodated for promoting the health of ſilk worms, and moſt convenient for thoſe who have the care of them, they may be various, according to the extent of the manufacture or the wealth of the proprietors. Silk worms may be kept in boxes or in ſhelves. When ſhelves are to be uſed, they may be conſtructed thus: The ſhelves may be of wicker, ranged at the diſtance of a foot and a half, and fixed in the middle of the room: their breadth ought to be ſuch, that any perſon can eaſily reach to the middle from either ſide. This is perhaps the ſimpleſt and cheapeſt apparatus for rearing ſilk worms; but there is another apparatus which may be recommended to thoſe who are anxious to unite ſome degree of elegance with convenience. This apparatus is the invention of the Rev. George Swayne of Puckle-church, who has ſtudied this ſubject much, to find out the way for promoting the culture of ſilk among the poor. This apparatus, with the deſcription of it, we have borrowed from that valuable work, the *Tranſactions of the Society for encouraging Arts, Manufactures, and Commerce.* Vol. VII. p. 148. The apparatus *Plate* CCCVII. conſiſts of a wooden frame 4 feet 2 inches high, each ſide 16½ inches wide, divided into 8 partitions by ſmall pieces which form grooves, into which the ſlides run, and are thus eaſily thruſt into or drawn out of the frame. The upper ſlide (*a*) in the model ſent to the ſociety by Mr Swayne is of paper only, and deſigned to receive the worms as ſoon as hatched; the two next (*b*, *b*) are of catgut, the threads about one 10th of an inch diſtant from each other: theſe are for the inſects when a little advanced in ſize: the five lower ones marked *c*, *c*, *c*, *c*, *c*, are of wicker work; but, as Mr Swayne afterwards found, netting may be ſubſtituted with advantage inſtead of wicker bottoms. Under each of theſe, as well as under thoſe of catgut, are ſliders made of paper, to prevent the dung of the worms from falling on thoſe feeding below them.

(8.) SILK: METHOD OF MANAGING THE WORMS. The proper time for hatching them is when the leaves of the mulberry are full grown, or nearly ſo; that as ſoon as theſe inſects are capable of receiving food they may obtain it in abundance. To attempt to hatch them ſooner would be hurtful, as the weather would not be ſufficiently warm. Beſides, as leaves are neceſſary to the life of a vegetable, if the young leaves of the mulberry-tree are cropped as ſoon as they are unfolded, the tree will be ſo much weakened as to be incapable of producing ſo many leaves as it would otherwiſe have done: and if this practice be frequently repeated, will inevitably be deſtroyed. When the proper ſeaſon is arrived, the eggs may be hatched either by the heat of the ſun, when it happens to be ſtrong enough, or by placing them in a ſmall room moderately heated by a ſtove or fire; and, after being expoſed 6 or 7 days to a gentle heat, the ſilk worm iſſues from the egg in the form of a ſmall black hairy caterpillar. When Mr Swayne's apparatus

apparatus is uſed, the worms are to be kept on the drawers with paper bottoms till they are grown ſo large as not readily to creep through the gauze-bottomed drawers: they are then to be placed on thoſe drawers, where they are to remain till their excrements are ſo large as not readily to fall through; when this is the caſe, they muſt be removed to the drawers with the wicker or netting bottoms, and fed thereon till they ſhow ſymptoms of being about to ſpin. It is ſcarcely neceſſary to mention, that the paper ſlides beneath the guaze and wicker drawers are intended to receive the dung, which ſhould be emptied as often as the worms are fed, at leaſt once a-day; or to direct, that when the worms are fed, the ſlides are to be firſt drawn out a conſiderable way, and the drawers to reſt upon them. As wet or damp food is exceedingly prejudicial to theſe inſects, and produces contagious and fatal diſeaſes, attention ought to be paid to the weather, ſo that when there is an immediate proſpect of rain, a ſufficient quantity of leaves may be gathered to ſerve the worms two or three days. In this country, the leaves of the black or red mulberry tree may be preſerved good for food, although kept four or five days, by the following method: When new gathered, lay them looſely in glazed earthen veſſels, place theſe in a cold place, well aired, not expoſed to drought. The utmoſt attention muſt be paid to preſerve the place where ſilk worms are kept as clean as poſſible: the houſe or room muſt be well ventilated, that no noxious vapours be accumulated. By ſome experiments of M. Faujas de St Fond, which are recorded in his hiſtory of Languedoc, it appears that the ſilk worms is much injured by foul air. All decayed leaves muſt be removed from them, as they emit bad air in great abundance. One of the moſt difficult branches of the management of ſilk worms has hitherto been the cleaning without bruſing them. To avoid this inconvenience, the peaſants in France and Italy frequently allow the whole litter to remain without ever cleaning them, which is the cauſe of that unwholeſome ſtench that has been ſo often remarked by thoſe who viſit the places for rearing ſilk worms in theſe countries. This difficulty may be effectually removed by providing a net, or what would be ſtill better, a wire-bottomed frame, wrought into large meſhes like a riddle. Get that made of a ſize exactly ſufficient to cover the wooden box in which the worms are kept. When you mean to ſhift them, ſpread freſh leaves into the wire baiket; and let it down gently over the worms till it comes within their reach. They no ſooner perceive the freſh food than they abandon the rubbiſh below, and creep through the meſhes, ſo as to fix themſelves upon the leaves; then by gently raiſing the freſh baiket, and drawing out the board below (which ought to be made to ſlip out like the ſlip bottom of a bird's cage), you get off all the excrements and decayed leaves, without incommoding the worms in the ſmalleſt degree; and along with the litter you will draw off an inch or two in depth of the fouleſt mephitic vapours. To get entirely rid of theſe, the board, when thus taken out, ſhould be carried without doors, and there cleaned: and the ſlip board immediately replaced to receive all the excrements and others. After it is replaced, the wire frame that had been elevated a little, may be allowed to deſcend to a convenient diſtance above the board without touching it. Thus will there be left a vacant ſpace for the mephitic air to fall below the worms ſo as to allow them to inhabit a wholeſome region of the atmoſphere. When a freſh ſupply of food is to be given before cleaning, the wire frame ought to be let down as cloſe to the board as can be ſafely done, and another wire bottomed frame put over it, with freſh leaves, as before deſcribed. When the worms have abandoned that in their turn, let the ſlip-board, together with the lower wire frame, be drawn out and removed, and ſo on as often as neceſſary. To admit of this alternate change, every table, conſiſting of one ſlip-board, ought to have two ſets of wire-bottomed frames of the ſame ſize; the ſlip board to be always put into its place immediately after it is cleaned, and the wire frames reſerved to be afterwards placed over the other. By this mode of management, it is probable that the worms would be ſaved from the diſeaſes engendered by the mephitic air, and the numerous deaths that are the conſequence of it avoided. Dr James Anderſon of Cotfield, author of *the Bee*, to whom this country has been much indebted for valuable works on agriculture, the fiſheries, &c. adviſes thoſe who have the management of ſilk worms to ſtrew a thin ſtratum of freſh ſlaked quicklime upon the ſlipboard each time it is cleaned, immediatly before it is put into its place. This would afford the mephitic gas, for as ſoon as it is generated it would deſcend upon the ſurface of the quicklime. Thus would the worms be kept continually in an atmoſphere of pure air, as has been proved by Mr Blancard's experiments. Were the walls of the apartments to be frequently waſhed with quicklime and water, it would tend much to promote cleanlineſs and augment the healthineſs of the worms, as well as of thoſe who attend them.

(9.) SILK: MR SWAYNE'S NEW RECEPTACLE FOR THE WORMS. When the ſilk worm refuſes its food, and ſilky traces remain on the leaves over which it paſſes, it is a proof that it is ready to begin its cocoon. It is now neceſſary to form a new receptacle, which is commonly done by pinning together papers in the ſhape of inverted cones with broad baſes. "This method (ſays Mr Swayne), where there are many worms, is exceedingly tedious, waſtes much paper, and uſes a large number of pins; beſides, as the ſilk worm always weaves an outer covering or defenſive web before it begins the cocoon or oval ball, I apprehended that it cauſed a needleſs waſte of ſilk in forming the broad web at the top. The method I make uſe of is, to roll a ſmall piece of paper (an uncut octavo leaf, ſuch as that an old magazine, is ſufficient for three), round my fore-finger, and to give it a twiſt at the bottom; which is done with the utmoſt expedition, and gives no occaſion for the uſe of pins. Theſe rolled paper-caſes being likewiſe of a form more nearly reſembling that of a cocoon, with a much narrower opening on the top than the others, takes away the neceſſity of waſting much ſilk in the outer web, and conſequently leaves more to be employed in forming the ball. The ſilk is readily taken out of theſe caſes by un-

twiſting the bottom; and if this be done with moderate care, and the papers are preſerved, they will ſerve ſeveral times for the like purpoſe." Others adviſe, that when the ſilk worms are preparing to ſpin, little buſhes of heath, broom, or twigs, ſhould be ſtuck upright near the ſhelf or box in which they are incloſed: the worms mount theſe, and attach their web to them.

(10.) SILK: REVIVING OF THE WORMS WHEN LANGUISHING. When the worms are ready to mount, in order to ſpin, if the weather be hot, attended with thunder, you will ſee them in a languiſhing condition; but they may be greatly revived thus: Take a few eggs and onions, and fry them in a pan with ſome ſtale hog's lard, the ranker the better, and make pancake; which done, carry it ſmoaking hot into the room where they are kept, and go round the chamber with it. You will be ſurpriſed to ſee how the ſmell revives them, excites thoſe to eat who have not done feeding, and makes the others that are ready to ſpin climb up the twigs.

(11.) SILK; SELECTION AND PRESERVATION OF THE ROYAL COCOONS FOR BREEDING. In about 10 or 12 days, according to Mr Andrew Wright of Paiſley, it may be ſafely concluded, that if the worms have finiſhed their work, the cocoons may be collected. We ſhall now diſtinguiſh the cocoons from one another according to their value or their uſe, and conſider the method of managing each. They may be diſtinguiſhed into the good and bad. The good cocoons may be known by theſe marks: they are little, ſtrong, and firm; have a fine grain, both ends are round, and they are free from ſpots. Among the good cocoons alſo may be arranged thoſe which are called *calcined* cocoons, in which the worm, in conſequence of ſickneſs, is petrified or reduced to a fine powder. Theſe cocoons produce more ſilk than others, and are ſold in the department of the Po, (late Piedmont) at half as much again. They may be diſtinguiſhed by the noiſe which the worm makes when the cocoon is ſhaken. Of the bad cocoons there are 6 ſpecies: 1. The *pointed cocoons*, one extremity of which ends in a point; the ſilk which covers the point is weak, and ſoon breaks or tears. 2. The *cocalons*, which are bigger, but the contexture is weak. 3. The *dupions*, or double cocoons, which have been formed by the joint labour of two and ſometimes of three worms. 4. The *foufflons*, which have a looſe contexture, ſometimes ſo looſe that they are tranſparent. 5. The *perforated cocoons*, which have a hole at one end. 6. The *bad choquette*, which is compoſed of defective cocoons, ſpotted or rotten. Beſides theſe there is the *good choquette*, which does not properly belong to either of theſe two claſſes; it is formed of thoſe cocoons in which the worm dies before the ſilk is brought to perfection. The worms adhere to one ſide of the cocoon, and therefore when the cocoon is ſhaken will not rattle: the ſilk is as fine, but is not of ſo bright a colour, nor is ſo ſtrong and nervous, as that which is obtained from good cocoons. The cocoons which are kept for breeding are called *royal* cocoons. For ſelecting and preſerving theſe, we have been favoured with ſome valuable inſtructions by Mr Wright of Paiſley, which we ſhall preſent to our readers—The largeſt and beſt cocoons ought to be kept for breed, about an equal number of males and females; the cocoons that contain the former are ſharper pointed at the ends than thoſe that contain the latter. Although it ſhould happen that there are more females than males, little inconvenience or ill conſequences can ariſe from it, as one male will ſerve two or three females, if the time of their coming out of the cocoons anſwer. About 12 or 15 days after they begin to ſpin, the cocoons for breed may be laid on ſheets of white papper; about this time the moth opens for itſelf a paſſage through the end of its cocoon, and iſſues out. When the female has laid her eggs, which on an average may amount to 250, they are ſpread upon ſheets of paper and hung up to dry in ſome place where they may not be expoſed to the heat of the ſun: after being dried they muſt be kept in a cool well-aired place, where neither vapours nor moiſture can reach them. That they may be preſerved from external accidents, as inſects of different kinds will deſtroy them, and mice is their enemy in all the ſtages of their exiſtence, they ſhould be kept in ſtone pots or glaſs bottles with their mouths ſtopped, and there remain until brought out next ſeaſon to be hatched.

(12.) SILK; THE PREPARATION OF THE COCOONS, FOR WINDING IT FROM THEM. The cocoons from which the ſilk is to be immediately wound muſt be expoſed to the heat of an oven, in order to kill the chryſalis or aurelia, which would otherwiſe eat its way through the cocoon, and render it uſeleſs. The following directions are given for managing this proceſs by one of the firſt ſilk manufacturers in Italy. Put your cocoons in long ſhallow baſkets, and fill them up within an inch of the top. You then cover them with paper, and put a wrapper over that. Theſe baſkets are to be diſpoſed in an oven, whoſe heat is as near as can be that of an oven from which the bread is juſt drawn after being baked. When your cocoons have remained therein near an hour, you muſt draw them out; and to ſee whether all the worms are dead, draw out a dupion from the middle of your baſket and open it; if the worm be dead, you may conclude all the reſt are ſo; becauſe the contexture of the dupion being ſtronger than that of the other cocoons, it is conſequently leſs eaſy to be penetrated by the heat. You muſt obſerve to take it from the middle of the baſket, becauſe in that part the heat is leaſt perceptible. After you have drawn your baſkets from the oven, you muſt firſt cover each of them with a woollen blanket or rug, leaving the wrapper beſides, and then you pile them above one another. If your baking has ſucceeded, your woollen cover will be all over wet with a kind of dew, the thickneſs of your little finger. If there be leſs, it is a ſign your cocoons have been too much or too little baked. If too much baked, the worm, being over dried, cannot tranſpire a humour he no longer contains, and your cocoon is then burnt. If not enough baked, the worm has not been ſufficiently penetrated by the heat to diſtil the liquor he contains, and in that caſe is not dead. You muſt let your baſkets ſtand thus covered five or ſix hours if poſſible, in order

to

to keep in the heat, as this makes an end of ſtifling thoſe worms which might have avoided the firſt impreſſion of the fire. You are likewiſe to take great care to let your cocoons ſtand in the oven the time that is neceſſary; for if they do not ſtand long enough, your worms are only ſtunned for a time and will afterwards be revived. If, on the other hand, you leave them too long in the oven, you burn them: many inſtances of theſe two caſes are frequently to be met with. It is a good ſign when you ſee ſome of the butterflies ſpring out from the cocoons which have been baked, becauſe you may be certain they are not burnt. For if you would kill them all to the laſt worm, you would burn many cocoons which might be more expoſed to the heat than that particular worm. The next operation is the winding of the ſilk. But before you begin to wind you muſt prepare your cocoons as follows: 1. In ſtripping them of that waſte ſilk that ſurrounds them, and which ſerved to faſten them to the twigs. This burr is proper to ſtuff quilts, or other ſuch uſes; you may likewiſe ſpin it to make ſtockings, but they will be coarſe and ordinary. 2. You muſt ſort your cocoons, ſeparating them into different claſſes in order to wind them apart. Theſe claſſes are, the good white cocoons; the good cocoons of all the other colours; the dupions; the cocalons, among which are included the weak cocoons; the good choquette; and laſtly, the bad choquette. In ſorting the cocoons, you will always find ſome perforated cocoons amongſt them, whoſe worm is already born; thoſe you muſt ſet apart for fleuret. You will likewiſe find ſome ſouffions, but very few; for which reaſon you may put them among the bad choquette, and they run up into waſte. The good cocoons, as well white as yellow, are the eaſieſt to wind; thoſe which require the greateſt care and pains are the cocalons; you muſt wind them in cooler water than the others, and if you take care to give them to a good windſter, you will have as good ſilk from them as the reſt. You muſt likewiſe have careful windſters for the dupions and choquetts. Theſe two ſpecies require hotter water than the common cocoons.

(13.) SILK, THE WINDING OF, FROM THE COCOONS. The good cocoons are to be wound in the following manner: Firſt, chooſe an open convenient place for your filature, the longer the better, if you intend to have many furnaces and coppers. The building ſhould be high and open on one ſide, and walled on the other, as well to ſcreen you from the cold winds and receive the ſun, as to give a free paſſage to the ſteam of your baſons or coppers. Theſe coppers or baſons are to be diſpoſed (when the building will admit of it) in a row on each ſide of the filature, as being the moſt convenient method of placing them, for by that means in walking up and down you ſee what every one is about. And theſe baſons ſhould be two and two together, with a chimney between every couple. Having prepared your reels (which are turned by hands, and require a quick eye), and your fire being a light one under every baſon, your windſter muſt ſtay till the water is as hot as it can be without boiling. When every thing is ready, you throw into your baſons two or three handfuls of cocoons, which you gently bruſh over with a wiſk about ſix inches long, cut ſtumpy like a broom worn out: by theſe means the threads of the cocoons ſtick to the wiſk. You muſt diſengage theſe threads from the wiſk, and purge them by drawing theſe ends with your fingers till they come off entirely clean. This operation is called *la Battue*. When the threads are quite clear, you muſt paſs four of them (if you will wind fine ſilk) through each of the holes in a thin iron bar that is placed horizontally at the edge of your baſon; afterwards you twiſt the two ends (which conſiſt of four cocoons each) twenty or twenty-five times, that the four ends in each thread may the better join together in croſſing each other, and that your ſilk may be plump, which otherwiſe would be flat. Your windſter muſt always have a bowl of cold water by her, to dip her fingers in, and to ſprinkle very often the ſaid bar, that the heat may not burn the thread. Your threads when thus twiſted, go upon two iron hooks called rampins, which are placed higher, and from thence they go upon the reel. At one end of the axis of the reel is a cog-wheel, which catching in the teeth of the poſt-rampin, moves it from the right to the left, and conſequently the thread that is upon it; ſo that your ſilk is wound on the reel croſsways, and your threads form two hanks of about four fingers broad. As often as the cocoons you wind are done, or break or diminiſh only, you muſt join freſh ones to keep up the number requiſite, or the proportion; becauſe, as the cocoons wind off, the thread being finer, you muſt join two cocoons half wound to replace a new one: Thus you may wind three new ones and two half wound, and your ſilk is from four to five cocoons. When you would join a freſh thread, you muſt lay one end on your finger, which you throw lightly on the other threads that are winding, and it joins them immediately, and continues to go up with the reſt. You muſt not wind off your cocoons too bare or to the laſt, becauſe when they are near at an end, the *bairré*, that is, the huſk, joins in with the other threads, and makes the ſilk foul and gouty. When you have finiſhed your firſt parcel, you muſt clean your baſons, taking out all the ſtriped worms, as well as the cocoons, on which there is a little ſilk, which you firſt open and take out the worm, and then throw them into a baſket by you, into which you likewiſe caſt the looſe ſilk that comes off in making the battue. You then proceed as before with other two or three handfuls of cocoons; you make a new battue; you purge them, and continue to wind the ſame number of cocoons or their equivalent, to ſprinkle the bar with water, &c. and ſo to the end. Be very careful to twiſt your threads a ſufficient number of times, about 25, otherwiſe your ſilk remains flat, inſtead of being round and full; beſides, when the ſilk is not well croſſed, it never can be clean, becauſe a gout or nub that comes from a cocoon will paſs through a ſmall number of theſe twiſts, though a greater will ſtop it. Your thread then breaks, and you paſs what foulneſs there may be in the middle of your reel between the two hanks, which ſerves for a head-band to tie them. Take care that the

water

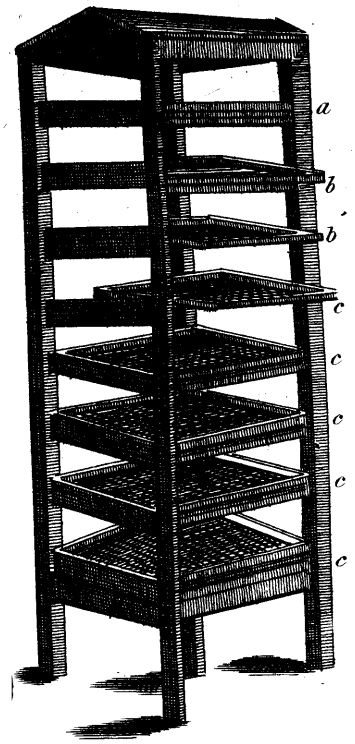
water be juſt in a proper degree of heat. When it is too hot, the thread is dead, and has no body; when it is too cold, the ends which form the thread do not join well, and form a harſh ill-qualified ſilk. Change the water in the baſon four times a day for the dupions and chequette, and twice only for good cocoons when you wind fine ſilk; but if you wind coarſe ſilk, it is neceſſary to change it 3 or 4 times. For if you were not to change the water, the ſilk would not be ſo bright and gloſſy, becauſe the worm contained in the cocoons foul it very conſiderably. You muſt endeavour as much as poſſible to wind with clear water, for if there are too many worms in it, your ſilk is covered with a kind of duſt which attracts the moth, and deſtroys your ſilk. You may wind your ſilk of what ſize you pleaſe, from one cocoon to 1000; but it is difficult to wind more than 30 in a thread. The nicety, and that in which conſiſts the greateſt difficulty, is to wind even; becauſe as the cocoon winds off, the end is finer, and you muſt then join other cocoons to keep up the ſame ſize. This difficulty of keeping the ſilk always even is ſo great, that (excepting a thread of two cocoons, which we call ſuch) we do not ſay a ſilk of 3, of 4, or of 6 cocoons; but a ſilk of 3 to 4, of 4 to 5, of 6 to 7 cocoons. If you proceed to a coarſer ſilk, you cannot calculate ſo nicely as to one cocoon more or leſs. We ſay, for example, from 12 to 15, from 15 to 20, and ſo on.

(14.) SILK, WEAVING, MR SHOLL'S IMPROVED LOOM FOR. The ſilk loom has been much improved lately by Mr Sholl of Bethnal-Green. It appears from the evidence of ſeveral gentlemen converſant in that branch of ſilk weaving to which this loom is particularly adapted, that the advantages of this conſtruction are, the gaining light, a power of ſhortening the porry occaſionally, ſo as to ſuit any kind of work, being more portable, and having the gibbet firmly fixed, together with the diminution of price; which, compared with the old loom, is as five pounds, the price of a loom on the old conſtruction, to three pounds ten ſhillings, the price of one of thoſe contrived by Mr Sholl; and that, as the proportion of light work is to ſtrong work as nine to one, this ſort of loom promiſes to be of very conſiderable advantage, particularly in making modes, or other black work. See *Plate* 307: where A, A, repreſents The ſills; B, B, The breaſt-roll poſts: C, The cut tree; D, D, The uprights; E, The burdown; F, The batton; G, The reeds; H, The harneſs; I, The breaſt-roll; K, The cheeſe; L, The gibbet; M, The treddles; N, The tumblers; O, Short counter-meſhes; P, Long counter-meſhes; Q, The porry; R, R, Cane-roll poſts; S, The cane-roll; T, The weight bar and weight; U, U, Counter-weights; W, The breaking rod; X, X, Croſs rods.

(15.) SILK, WORMS NECESSARY TO PRODUCE A CERTAIN QUANTITY OF. What number of worms are neceſſary to produce a certain quantity of ſilk has not been aſcertained. And as different perſons who wiſhed to determine this point have had different reſults, the truth ſeems to be, that from various circumſtances the ſame number of worms may produce more ſilk at one time than at another. It is related in the ſecond volume of the Tranſactions of the Society for encouraging Arts, &c. that Mrs Williams obtained nearly an ounce and a half of ſilk from 244 cocoons. Mr Swayne from 50 cocoons procured 100 grains. Miſs Rhodes obtained from 250 of the largeſt cocoons, three quarters of an ounce and a dram. From a paper in the ſecond volume of the American Tranſactions, which we have before referred to in the courſe of this article, we are informed that 150 ounces of good cocoons yield about 11 ounces of ſilk from five to ſix cocoons: if you wind coarſer, ſomething more. But what appears aſtoniſhing, Mr Salvatore Bertezen, an Italian, to whom the Society for encouraging Arts, &c. adjudged their gold medal, raiſed five pounds of excellent ſilk from 12,000 worms. The cocoons produce a thread of very unequal length; you may meet with ſome that yield 1200 ells, whilſt others will ſcarcely afford 200 ells. In general, you may calculate the production of a cocoon from 500 to 600 ells in length.

Plate CCCXII.

Swayne's apparatus for rearing Silk Worms.



Mr. Sholl's improved Silk Loom.