pare the requirements of the different sorts, and the means at his disposal to satisfy them, before making his selection. Though tobacco is a hardy plant, and grows under varied conditions, yet to become a remunerative crop, the plant should not be placed under circumstances very dissimilar from those to which it has been accustomed. By importing seed of a fine sort directly from its native land, the plants will not retain in the new habitat all their special qualities, unless climate, soil and treatment are nearly the same. Climate must first be considered. Fine and valuable tobacco is a product of tropical countries: in a warm and humid climate, by employing common means, tobacco may be made to yield a profit not attainable in less favoured regions. A warm, moist climate permits the selection of those sorts that command the highest prices; if to this be added a suitable soil, and proper treatment, the cultivation of tobacco yields a profit not easily obtainable from any other crop.

As the Havanna tobaccos command the highest prices, the cultivator nearly everywhere attempts to introduce and cultivate them. There is no great difficulty in raising plants of these varieties, but they speedily degenerate and form new varieties, if the climatic conditions, &c., are not favourable. Virginian tobacco was previously extensively cultivated, but has of late been frequently replaced by the Maryland kind. It is still much favoured by cultivators in temperate climates, as it does not require a high temperature. On account of its botanical characteristics, it is usually not much liked by manufacturers of cigars; some varieties, however,

that have less of the marked specific characters, yield tolerably fine leaves for cigars. As the price of this tobacco is rather low, it is not so well suited for export. Hungarian tobacco is considered to be very hardy, but is less valuable than the foregoing. The leaves are generally small, and possess a peculiar aroma.

A high price is generally commanded, irrespective of the species, by those tobaccos that possess a large, smooth, thin, elastic leaf, possessing a fine golden colour and a good aroma; the ribs and veins should be thin, and the former should branch off from the midrib at nearly right angles, and should be far apart from each other. The lower the percentage of the weight in ribs, the thinner and broader the leaf, and the fewer the leaves torn, the more wrappers can be cut out of 1 lb. of tobacco, other conditions being equal, and consequently the higher is the price of the article. The cigar-manufacturer often does not appreciate the aroma so much as the other qualities. He can do nothing to improve the botanical characters: the finest aromatic leaf would be of little value to him if it were torn; but he is to a certain extent able artificially to improve defects in flavour. Of all kinds, Maryland is considered to possess the qualities that distinguish a good tobacco in the highest degree. Some of the Havanna tobaccos belong to this sort, as also the Ohio, Amersfort, Turkish, and Dutten tobaccos. Its cultivation assumes larger proportions every year, and the number of varieties and sub-varieties increases accordingly. Perhaps the finest wrappers for cigars are grown in Manilla.

On this subject, Judson Popenoe remarks that he has

"cultivated various kinds of tobacco, but have come to the conclusion that what we call the Ohio seed-leaf is the best and most profitable kind for general cultivation. There are other kinds of tobacco that sometimes are profitable, and do well, but most of these do not cure out so well, nor colour so evenly, nor are they so fine and saleable as t seed-leaf. The Havanna tobacco is too small and has not the fine flavour of the imported. The Connecticut seed-leaf I believe to be identical with our Ohio seed-leaf; the difference in the climate may make a slight variation in the quality, but we plant the Connecticut seed-leaf here in Ohio, and I do not think they can be told apart."

Schneider recommends the following varieties: "1. Connecticut seed-leaf, principally for cigar-wrappers; 2. Cuba, for fillers and wrappers; 3. Maryland; 4. Virginia, the last two principally for smoking and chewing tobacco. For snuff everything may be used, the refuse and even the stems. The Connecticut, Maryland, and Virginia yield the largest crops, the Cuba the smallest but best. The first varieties yield about one thousand pounds, the latter five hundred pounds. In very favourable seasons double the amount may be raised. All tobacco-seed, which is removed from its native clime and soil, will deteriorate, and the seed must be renewed from its native place, although the seed may, when it finds favourable soil, &c., yield just as good, if not a better variety."

In Virginia, remarks Thomas, there are "as many varieties of tobacco-seed as of corn or wheat. I will name a few: The Big Frederic, the Little Frederic, the

Blue Stalk, the Brittle Stem, the Big Orinoco, the Little Orinoco, and half-a-dozen others, each having, or supposed to have, some characteristic distinguishing it from all the others. But the Brittle Stem and the Orinocos were the varieties mostly cultivated, the former for its early maturity, the latter for its comparative heaviness. There are several varieties, also, in this vicinity, such as the Brittle Stem, the Graham Tobacco, and the Cuban, but the names convey little certain information, as the same varieties bear different names in different localities. But some varieties are evidently to be preferred to others—one noted for early maturity, all things else equal, is preferable to another that ripens late. One distinguished for fineness of texture, all things else equal, is better than another of coarser fibre, &c. Upon the whole, the surest and most profitable variety is that which ripens earliest, and yields the largest number of pounds, cured, to a given number of hills planted."

In the opinion of Perry Hull, a grower in Litchfield county, Connecticut, "the variety best adapted to our purpose is that known in this State as the Bull Tongue. The leaf is neither too long nor too short; the length and width being in such good proportion that manufacturers considered there is less waste than there is to a very long narrow leaf, or a very broad short leaf. It yields well, and ripens at least one week earlier than many of the broader varieties. Almost any of the seed-leaf varieties will do well; but never patronize any of the humbugs sent from the Patent Office, under the name of Graham tobacco, Maryland broad leaf, &c. They are a Southern tobacco, and when grown upon that soil, make

chewing-tobacco; but here it is good for nothing for that purpose, and is too coarse for cigar-wrappers."

According to Dennis, an Indiana planter, "selection of seed depends upon the kind of land you have and the quality of tobacco you wish to raise. Rich, fertile bottom-lands will grow only heavy, strong tobacco, and it is the interest of the farmer to select that kind of seed that will produce the plant of the greatest weight; in other words, to make weight the prominent object in the result of the crop. Thinner, poorer land will produce tobacco of lighter weight, but of finer and more desirable quality, and one that will bring a correspondingly higher price. The Orinoco tobacco is raised extensively in Missouri and Kentucky for heavy tobacco, and is known in market as Kentucky Leaf. The seed for the finer qualities passes (as does the other also) under different names, but may be procured in Pike and Calloway counties, Missouri, and in Virginia; the Orinoco, and kindred kinds, in Howard and Chariton counties in Missouri. I should suggest that the seed may be procured through the agents of express-companies at Glasgow, Brunswick, and Renick for the Orinoco, and at Louisiana or Fulton for the other qualities. I would recommend the culture of the coarser, heavier kinds, for the reason that the finer quality needs much more care and experience in the handling, in order that it may go into market in a condition to command such a price as its quality, when well handled, entitles it to."

In the words of Libhart, a Pennsylvanian farmer, the "best variety for cultivation in a high northern latitude is the Connecticut seed-leaf, as it ripens two weeks earlier

than most any other variety, cures and colours better, and commands the highest price in the market. The Pennsylvania seed-leaf outstrips the Connecticut in size and weight, but owing to its requiring a longer time to mature in, is not so well adapted to climates north of 41° or 42°."

An experienced Missouri grower, named Pursley, remarks that there "are more than twenty distinct varieties, of which I will only mention the most valuable :—The Yellow Prior, Blue Prior, Orinoco, Little Frederic, Big Frederic, Cuba, and Spanish tobacco. These are considered the most valuable in this State. The Yellow Prior and Orinoco are the most profitable.

"I prefer the Yellow Prior, as it is the easiest cultivated and is the most fine and smooth of the many varieties. Some growers prefer the Orinoco, on account of it being the heaviest. I do not for various reasons: it has large stiff fibres and ruffled stalks, which afford hiding-places for insects; it moulds easier, is harder to cure, and generally does not bring as good a price as the Yellow Prior."

Seed.—The best and strongest plants are selected for affording seed. These are not "topped" like the remainder of the crop, and are left standing when the crop is gathered. All suckers are carefully removed from the stems, and sometimes from the leaves also. When the crop is cut, the seed-stalks should be staked, to prevent their destruction by the wind. As soon as the seed-pods blacken, the seed is ripe; the heads are then cut off below the forks of the plant, and are hung in a dry and safe place to cure. Care must be taken to gather them before

frost has impaired their vitality. During leisure time, the pods are stripped from the stalks, and the seed is rubbed out by hand, and winnowed. Its vitality is proved by its crackling when thrown upon a hot stove.

Seed-beds.—A very light friable soil is necessary for the seed-beds; to obtain this, it should be broken up to a depth of 1½ ft. some months before the sowing season. A drain is dug around the beds, and the soil is utilized in raising the surface. In America, a very warm and sheltered situation, such as the south end of a barn, is selected for the seed-beds. It is a common plan there to burn a brush-heap over the ground, thus supplying potash and killing weeds. The time for sowing in America is usually from the middle of March to the 10th of April, or as soon as the ground admits of working in the spring; in India, it depends upon the locality: when the monsoon rains are very heavy, it should follow them; in other cases, it may precede them.

Unless the soil be very rich in humus, it should be heavily manured with well-preserved farmyard manure soon after breaking up. The soil of a tobacco nursery cannot contain too much organic matter; the presence of much humus will prevent, to a great extent, the formation of a surface crust, which is so detrimental to the development of the plants during their early growth, and will also facilitate the extraction of the plants when transplanting takes place. After a few weeks have elapsed, the soil should be dug over a second time, and the whole be reduced to a fine tilth. The land may now remain untouched until the sowing-time, unless weeds should spring up: these must be eradicated.

The area required for a nursery depends on the area of ground to be planted, and on the distance separating the plants in the field. About 1 sq. in. space should be allotted to each of the young plants in the nursery. Taking the number to be 7260 plants required for an acre (at 3 ft. × 2 ft.), and giving each plant 1 sq. in. of room, an area of 7000 sq. in. or 50 sq. ft. would raise plants sufficient for an acre. But as some are injured during growth, many rendered useless in lifting them for transplanting, and more needed to replace those that die after transplanting, double the number should be raised, or 100 sq. ft. of nursery bed for an acre.

The amount of seed required for an acre depends chiefly on its vitality. An ounce contains about 100,000 seeds, or sufficient for nearly 7 acres if all grew; but as even the best has not a very high percentage of vitality, ½–1 oz. is generally sown to produce the plants required for one acre.

Sowing-time having arrived, the nursery is divided into beds, most conveniently, 10 ft. long and 5 ft. wide, making 50 sq. ft. each, on which plants for ½ acre can easily be raised. As, even with a small tobacco plantation, several days are required for transplanting, all the beds should not be sown at one time, but at intervals of a few days. This will also lessen the risk of the young plants being all destroyed by a storm, insects, &c. Before sowing the seed, the soil is dug over to the depth of 6 inches, and levelled with a rake. The seed must then be sown evenly on the surface, and beaten down slightly with the hand or otherwise. The seed being very small, many cultivators mix it with ashes, or pulverized gypsum, in order to distribute it regularly over the bed. The seed must be

covered only slightly, best done by strewing a little fine compost manure over it. Ants, which often destroy the seeds, may be kept off by sprinkling some ashes over the bed. Finally cut straw may be scattered over the surface. In India, to protect the nursery from the sun and rain, the whole is covered with a roof made of straw, leaves, or cloth, supported by poles, at only a few feet above the ground. The soil must be kept constantly moist, but not wet; weak liquid manure may be used for watering. Much time is saved by starting the seed in a warm room before sowing.

The plants, which will appear about a week after sowing, are very tender during the first stage of their growth, and require frequent watering through a fine rose. The straw will now prevent the water falling with any force immediately on the plants, and its tendency to wash the soil from the fine rootlets. If the plants spring up thickly, they are thinned out, when about a week or two old, leaving about 1 sq. in. for each. Those taken out may be used to fill blanks in the nursery bed, or, if more plants are taken out than are required for this purpose, they should be planted in a separate bed. It is universally acknowledged that plants transplanted when very young develop more roots, grow more vigorously, and become more hardy afterwards, than when not transplanted at this stage. When the plants are about two weeks old, they require less attention, and should be watered less frequently, to harden them before transplanting. Any weeds appearing must be removed, and injurious insects must be killed. In about 7–8 weeks after sowing, the plants will be fit for transplanting.

Bowie, a Maryland planter, gives his experience in the following words:—"After a thorough burning of brush, dig deep, and continue to dig, rake, and chop until every clod, root, and stone be removed; then level and pulverize nicely with a rake. As to the variety to plant, I think the Cuba is a very good kind for our climate. The Connecticut seed-leaf is the best, but culture has more than anything else to do with the quality. Mix 1 gill of seed for every 10 square yards with a quart of plaster or sifted ashes, and sow it regularly in the same manner that gardeners sow small seeds, only with a heavier hand; roll with a hand-roller or tramp it with the feet. If the bed is sown early, it ought to be covered with brush free from leaves; but it is not necessary to cover it after the middle of March. Tobacco-beds may be sown at any time during the winter if the ground be not too wet or frozen. The best time for sowing is from the 10th to the 20th of March, though it is safest to sow at intervals, whenever the land is in fine order for working. Never sow unless the land is in good order, for the work will be thrown away if the land be too moist or be not perfectly prepared. The beds must be kept free from grass or weeds, which must be picked out one at a time by the fingers. It is a tedious and troublesome operation, therefore you should be very careful not to use any manures on your beds which have grass or weed-seeds in them. After the plants are up, they should receive a slight top-dressing of manure once a week, sown broadcast by the hand. This manure should be composed of ½ bushel of unleached ashes (or 1 bushel of burnt turf), 1 bushel of fresh virgin woods-earth, 1 gallon of plaster, ½ gallon of

soot, 1 quart of salt dissolved in 2 gallons of liquid from barnyard, and 4 lb. of pulverized sulphur, the whole well intermixed. Let a large quantity be got together early in the spring, or winter rather, and put away in barrels for use when wanted. This, and other such mixtures, have been found efficacious in arresting the ravages of the fly—both from the frequent dusting of the plants and the increased vigour which it imparts to them, thereby enabling the plant the sooner to get out of the tender state in which the fly is most destructive to it. The fly is a small black insect, somewhat like the flea, and delights in cold, dry, harsh weather, but disappears with the mild showers and hot suns of opening summer. If possible, the plants should stand in the bed from ½ inch to 1 inch apart, and if they are too thick they must be raked when they have generally become as large as 5 or 10-cent pieces. The rake proper for the purpose should be a small common rake, with iron teeth 3 inches long, curved at the points, teeth flat, and ⅜ inch wide, and set ½ inch apart."

Schneider, whose success as an Illinois planter has already been mentioned, expresses himself thus:—"Raising tobacco-plants from seed is somewhat similar to raising cabbage-plants, but is different in two important things: It takes considerably more time for the seed to sprout (six weeks), and, on account of disturbing the roots, cannot well stand weeding. Therefore the principal care in providing the seed-bed is, to prepare for the early starting of the seed, and to have the bed free from all weed-seeds. In the West we prepare the seed-bed in the following manner: we take a plot of land—newly cleared land is preferred—sloping southward, and pro-

tected against winds. The bed should be 4 feet broad and 8 feet long; on this we pile brush, wood, and heavy logs, sufficient to keep up a strong fire for at least one hour, and burn it. When the coals begin to die out, or before the soil is cold, the bed is cleared off, and only the fine ashes are left; then it is hoed thoroughly and as deep as the strongest heat has penetrated, after which it is raked cross and lengthwise, until the soil is entirely pulverized. Everything that might hinder the growing of the plants, and their taking out afterwards, is carefully removed. On this bed a thimbleful of seed, well mixed with a few handfuls of ashes or earth, is sown broadcast, and tramped in with the feet, or slapped with the under side of the spade or any other suitable instrument. After this, the bed is thoroughly wetted with a weak manure-water, 12 lb. of hen-droppings, or 1 lb. of soot in 10 gallons of water, and lightly covered with straw. The seed-bed does not need much attention at first, if the weather remains mild; but if there is danger of night-frosts, a layer of brush must be made, and on this a layer of straw 2 to 4 inches thick, according to the degree of frost. The straw is removed in the morning, and put on again at evening, leaving it off entirely when the nights are mild. Although the seed-bed is ready now, it must not be left to itself, and requires some care. The plants must always have sufficient moisture, and if timely rains do not fall, they must be watered with weak liquid manure as often as needed. Should weeds appear, notwithstanding all precautions, they must be removed with the utmost care. The above-mentioned quantity of seed is sufficient to raise plants for one acre.

"Whoever is in possession of a hot-bed can raise the plants much easier; he can sow later and have plants earlier and with more certainty. But even the common bed may be made into a kind of hot-bed. The burned and hoed surface soil is removed and put on one side, then one foot of fresh horse-dung is laid on the subsoil, and the surface soil put back again. Boards may be placed around, cross-pieces laid over them, and the straw covering put on these.

"The earlier the young plants are ready for transplanting the surer the tobacco crop will be. March is the latest to make the seed-bed in the open air, and June the latest for transplanting. Some time may be gained by keeping the seed in damp earth in the room, and sow it in the seed-bed just before it commences to sprout."

Having selected a suitable location, says White, a Connecticut grower, "next consider how large a bed you will need. That depends on the surface you intend to plant out. A bed 2 rods long, by 12 feet wide, will produce a sufficient number of good plants to set an acre. On such a bed you should spread a heavy coat of good, fine, well-rotted manure, at least 2 inches thick; let it be free from straw or other litter. Then, with a good strong back, and long-handled spade (or other as you prefer), spade up the bed, mixing in the manure very fine. Have ready some fine dry brush, or the like, and spread over the whole surface; set it on fire and burn to ashes. A small quantity will answer better than a very large one, for if very much is burned, it is apt to do injury by burning the soil. The less quantity will tend to destroy any foreign seed turned up, and warm the ground. Having

reduced the brush to ashes, take a fine iron or steel rake, and proceed to pulverize very finely the whole surface spaded up. After reducing it to as fine a state as possible, and having made it flat and level, leave it till the next day. Then, with your rake, carefully rake over the whole bed; it is now ready for the seed. Sow the seed on broadcast; be careful to sow it even and true. About two thimblefuls, or a little less, will be sufficient for such a bed. It is better to have too little than too much, as in the first instance, the plants will have room to form thick stalky roots and well-spread leaves, while in the latter they will be crowded with spindling tops as well as small roots. Having sowed your seed, take a good heavy garden-roller and roll the surface down hard and smooth. In the absence of a roll, a very good substitute can be made by taking a piece of 2-inch plank, say 18 inches long by 14 inches wide; in the centre, place an upright handle. With this spat the bed over, being careful to do it evenly, and to leave the surface solid and level, the reasons for which you will afterward discover in weeding and taking out plants to set in the field. This should be done in the spring, as soon as the ground will permit, say first of April, if the frost is out and the ground settled. The roll or spatter will cover the seed sufficiently without any other covering. To be able to sow the seed with the least trouble, mix it in thoroughly with wood-ashes or plaster, before sowing. To obtain plants earlier, you can mix your seed thoroughly in about a quart of light chip dirt from under your wood-shed; put it in some proper vessel, and wet to the consistence of soft putty, with water as warm as can be well borne by the hand. Set it

on the mantle-shelf in the kitchen, not too near the stove or fire, but where it will keep warm. In the course of a week or ten days, the seed will have cracked the shell, and will show the small white germ or sprout. It should now be sowed broadcast very evenly, and treat as before described. If properly wet at first, it will need no more water to sprout the seed. Before sowing, pulverize the mass containing the seed, to facilitate the sowing. Having thus sown and rolled down your bed very nicely, it is well to have something to protect it from the encroachment of the fowls. For this purpose, spread a net of twine or a few brush over the surface, covering it so that they may not disturb the surface by scratching and wallowing. It may now be left till the weeds begin to make their appearance; these you will need to extract by the roots as soon as the plants can be distinguished; these last may be known by two very small nearly round leaves opening over flat on the ground. Now procure a plank or some substitute a little longer than your bed is wide, also two blocks 5 or 6 inches square, as long or longer than your plank is wide; place one on one side of the bed, the other on the opposite side; on these two blocks place your plank, and you will have a fine platform on which you can sit and weed any part, or all, of your bed, by moving it as occasion may require. To assist in pulling out the weeds, procure a moderately sharp-pointed knife, and with the same grasped in the hand with the thumb near the point, pinch out the weeds, being careful not to disturb the dirt any more than absolutely necessary. The process of weeding must be repeated as often as necessary, to keep the bed clean from weeds."