AN ESSAY

UPON

THE CURING, MANAGEMENT,

AND

CULTIVATION OF TOBACCO;

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tended as a Guide to those who may undertake to carry into effect his Patented System, or Modes of Procedure, for the Curing and Drying of that Article.

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INTRODUCTION.

My first experiments in the curing of tobacco were made in the year eighteen hundred and twenty-eight. Those experiments, and the conflicting modes of management pursued by the planters, even by those who were the most intelligent, soon convinced me that the subject was but very imperfectly understood, and that there was great need of some regular system by which the greater part, if not the whole of a crop, could be so cured as to be of good quality.

With a view to the discovery of such a system, and under the guidance of those principles, in the economy of vegetables, which are well known and established, numerous and accurate experiments were made in the three succeeding years, from which has resulted the system I now offer.

D. G. Tuck

SECTION I.

Of the drying-house or barn—the thermometer—the distribution of the tobacco—the fuel—the stoves or kilns, and flues, for heating the drying-house—the scaffolds, or platforms, for diffusing the heat.

The house in which the tobacco should be stored away for curing, may be of any figure or dimensions the planter may choose, but the walls and gable ends should be as tight as possible; and the latter, unless tighter than usual, should be lathed, and crammed with dirt or mortar. The roof should be of shingles, or of slabs nailed or pegged to laths; and should have sufficient apertures in it, or intervals between the shingles or slabs, for the escape of the vapor arising from the tobacco whilst the process is in operation. Such a roof as is common to barns will answer very well. In roofs already made, if too tight, I would advise that small apertures be made on each side of the ridge-pole, or top; which openings should be so covered as to keep out rain. The door should also be very tight, fitting its facings closely, and having an inside and an outside bolt. Double doors, with an interval of a foot or more between them, one of them opening inside, and the other outside of the house, and both fitting closely to the opposite edges of the same facing, would, in all cases, be found advantageous. With such double

doors, the air can be excluded more effectually from the tobacco; the first can be closed before the second is opened, and the process, consequently, can be conducted with the greater accuracy. Open houses, such as are ordinarily used, are extremely objectionable. When tobacco is housed for the purpose of being dried, *heat, and not air*, is the element which should be employed to effect that object. As soon as the vital principle of the plant is gone, it has no further need of air beyond the quantity which is unavoidably afforded it; all it requires is, that quantity of heat which will dry it in the best manner, and a house sufficiently open to permit the escape of its extricated vapors. The tier-poles for supporting the sticks holding the tobacco, may be arranged as the planter chooses; the floor should be level, and one or two windows in the body or gable ends of the house, will be found very convenient for various purposes; and these, like the door, should be tightly fitted. Equidistant from the corners of the house, and eight or ten feet high, there should be another window, large enough to receive a small pane of glass, which should be fitted in it as closely as possible. This window may be on either side of the house; the side next to the door, however, will be found most convenient. A small opening should be made in the door, or in some other convenient place, for the purpose of viewing, when necessary, the interior of the house. This open-

ing, as well as the windows, should have a tightly fiting shutter or stopper.

The house being in the requisite condition, a thermometer should be suspended in the centre of it, eight or ten feet from the floor. It will be best to attach it to a string passing round pulleys or rollers, so arranged that the thermometer may be drawn for inspection towards the small glass window in the side of the house, and passed back to the centre, at pleasure. One of the pulleys or rollers should be outside of the house, just over the glass, and the other just beyond, or near the thermometer, and the strings around them should fit closely into the holes in the house through which they pass.

The tobacco should next be stored away, and, if very large and full of sap, six or seven plants will be sufficient for a stick; if very small, ten or twelve; supposing the sticks to be four and a half feet long, which is, I believe, the most common length. All very large plants should be cut or split into two at the time of cutting them in the field. When the stalk is very long, it is best to divide them transversely; but when otherwise, longitudinally. Each plant should occupy no more than its due proportion of the stick, and the sticks should be placed from six to twelve inches apart, according to the size and sappiness of the tobacco. A similar space should also be left between the tobacco and the walls of the house. Hanging it thin,

is of much consequence when the tobacco has a redundancy of sap. Care should be taken to avoid bruises, to pull apart all leaves adhering together, and to prevent the tobacco from being in contact with any thing but the stick that supports it. Whilst storing, a space of a foot or more, should be left between the thermometer and the glass window, so that the former may be drawn backwards and forwards without obstruction. In every instance in which I have used the thermometer, a space of four or five feet square has been left around it, and was extended downwards to the scaffold or floor. If there should not be tobacco enough to fill the house, the thermometer should first be surrounded by it, in the proper manner, and the remainder be equally distributed from the centre.

Well dried hickory, or oak, wood should be preferred as fuel for the process, when it is intended to admit the smoke; when it is to be excluded, other descriptions will answer. It will be found best, however, always to have the wood dry, even when the smoke is excluded.

The next thing for consideration is the heating of the drying house. Any stove or kiln will be sufficient for that purpose, (in which a fire can be made that will raise the temperature of the house to 160 degrees, or thereabout, of Fahrenheit's thermometer,) under the circumstances and within the period that will be here-

after mentioned. A stove or kiln of the following description will answer well in a house of the ordinary height and size—say of twenty feet square—and combines such advantages, in regard to economy and simplicity, as to enable any person to use it: Raise a brick or stone pen, with its walls as thin as they can be made, so as to preserve the necessary strength; it may be eight feet long, in the clear, three wide, two deep, and arched over with brick, or any other suitable material, so as to make it three feet high in the interior, when it is finished. In each side of the kiln or pen, near the floor, there should be five or six holes, equi-distant from each other, and about double the size of a brick, to let out heat when the fire is raised. Its ends should point towards the gable ends of the house, and in each should be an opening for the supply of fuel; and its centre should cover the centre of the floor, or thereabouts. It should be so situated as to afford the greatest facilities for equalizing the temperature of the house when the fire is raised. If the house should be larger, the stove or kiln should be enlarged accordingly, or more kilns must be provided. The heating of the drying house, by this kiln, although much safer to the barn and to the tobacco, and in all other respects better than the mode by open fires, usually adopted, is, nevertheless, in some respects, objectionable. When the door is opened for the purpose of supplying the fire with fuel, the ad-

mission of the atmosphere impairs the equability of the temperature of the house, and, to a slight extent, interferes with the success of the process, particularly when it is conducted without double doors. Besides, when the fire is intense, and fresh fuel is added, it emits a dense, black, sooty smoke, which, in some degree, impairs the value of the tobacco. Except at those times, the combustion is more effectual, and but very little smoke escapes from the kiln. If the barn should be so very tight as to prevent the admission of a sufficiency of air to keep an active flame in the kiln when required, ventilators should be used for that purpose. They will, however, be but seldom necessary.

If it should be desired to exclude the smoke entirely, which I think should always be done, it may be easily effected, and the house be sufficiently heated by flues or kilns passing entirely through it. In a house of twenty feet square, and of ordinary height, two flues, with an interior of two feet and a half square, will be sufficient. The arch and walls should be as thin as the necessary strength of the flues will allow; and in one end of each should be an opening for the supply of fuel; in the other end, a perpendicular flue or pipe, of brick or metal, eight or nine inches in diameter, and five or six feet long, for the escape of the smoke. Unless the walls be very thin, the transmission of heat through them will be very slow—an inconvenience that may, in some degree, be re-

moved by covering the kilns wholly, or in part, with sheet iron. The flues, or stoves, should extend in the direction of the gable ends of the house, and be placed on its floor in such a manner as will make them dif fuse the heat most equally. By this mode, however, of raising the heat, much more fuel is required than by any other—perhaps six or eight times the quantity—particularly when the flues are not covered with sheet iron; when thus covered, the quantity of fuel required is very much lessened. This mode is objectionable in other respects. Whenever the wind is high, and adverse to the draught of the flues, they cease to draw, or draw very badly, and the tobacco becomes injured by the unavoidable suspension of the process. This difficulty I have known frequently to arise.

The drying house may be also sufficiently heated by stoves or kilns erected within its walls, so constructed as to carry off the greater part of the smoke, and require much less fuel than tight flues. Such a kiln or stove as the one first named, supplied with an appropriate pipe, at each end, for carrying off the smoke, and sheet iron, or other shutters, to close the ends, when required, I have found to answer tolerably well, though liable, in part, to the objections of that kiln. Any mode of raising the heat which makes it necessary to enter the house frequently, is objectionable. Such a kiln, however, is much to be preferred to open fires, or such kilns as admit the smoke and other vapors.

Such scaffolds or platforms should be employed as will diffuse the heat most equably. In a house of twenty feet square, one scaffold, eighteen feet long and ten wide, erected over such a kiln as the one which was first and last described, I have found to answer well. It should be about six feet high, and may be made of rough plank, placed loosely upon poles: the planks, however, should always have an interval of one or two inches between them, for the ascent of the heat. Two scaffolds, of the same length and height, and about four feet wide, erected over the flues which have been described, will also answer the intended purpose. They may, however, be placed lower, provided there is no danger from the fire: the nearer they are to the flues the better they will operate in equalizing the heat. By raising the fire, and suspending thermometers in different parts of the house, their capacity in this respect may be easily ascertained. This should always be done, particularly when the size or figure of the drying house is different from the one just named. Such an experiment, however, never should be made after the tobacco is housed.

I will again return to the heating of the drying house. In the Fall of eighteen hundred and thirty, I constructed a flue, or flues, for which I obtained letters patent of the United States, independent of the patent obtained for the system of curing. These flues

have completely overcome all the difficulties presented by those before named. Their draught is not at all dependent upon the direction of the winds: they exclude or admit the smoke, as may be preferred; enable the attendant to command promptly any required temperature; and very much economise the quantity of fuel, when compared with other flues which exclude the smoke. The following is a description of them, in the words of the specification of the patent:—

"The material of which I usually construct the said flues or stoves, is common brick; as, under most circumstances, it is most readily obtained, and less costly than any other. They, however, may be made of stone, iron, fire-bricks, slabs, or tiles, made and baked in the manner of brick, or of any other material. The dimensions of my said flues or stoves must be varied to suit the size of the barn, or drying house, in which they are to be used; and they will also admit of considerable variation in this particular, in a house of any size, whilst the principle of construction may yet be retained. For the sake of description, I assume certain dimensions, which I have found to answer the intention perfectly, but do not intend to establish any limit in this particular.

"These flues are to be so constructed that they may be supplied with fuel from the outside of the house, and that the smoke, and other vapors from the fire, which it may be desirable to exclude from the in-

terior of the building, shall, after passing through the large flue, or stove, in which the fire is contained, to a spot near the centre of the building, return through a second or smaller flue, which may be parallel to, and in contact with, that first named, and be delivered, or have its exit, near the opening for feeding the fire.

"Suppose my house to be twenty feet square, and of the ordinary height: near the middle of one end or side of the barn, I make an opening for the mouth of my flue or stove; this flue or stove is a square or arched trunk, about thirty inches in width, and the same in height. It is built horizontally upon the floor of the barn, and extends within it to the distance of about seven feet from the wall. To receive the inner end of this flue, a square, or other formed pen, or box, is erected, of brick, or other materials. This pen or box may be four feet in length, and two in width, and of the same height with the larger flue or stove, which terminates in it. It should stand at right angles with the flue or stove, which is to enter it in one of its broad sides. The smaller flue, through which the smoke is to return, also opens into this box or pen, alongside of the larger flue, and may return, and pass through the building in the vicinity of the fireplace, or feeding door. This second flue may be made of the same materials with the former, but need not be more than one-fourth of its size. From the

end of it a flue or pipe is erected, perpendicularly, to the height of five or six feet, to serve as a chimney, to furnish a draught and carry off the smoke. The interior diameter of this chimney need not exceed seven or eight inches, and an iron plate, or some other flat article, must be provided to stop the draught, when required, by being placed upon the top of the said flue.

"It is manifest, that, in a structure of this kind, a fire may be made, and that the smoke will pass out at the chimney; but, as soon as the wood is charred, and the fire burns clearly, it is intended to admit the heated air into the barn, and to stop the draught through the flue, or chimney. For the purpose of admitting the heated air, the pen or box, before described, is provided with an iron or other door or stopper, opening from it into the barn. This door may be twenty inches square: it may be fixed by hinges, or otherwise, so that it may be opened as soon as the smoke has ceased to escape from the chimney, and, at this time, the top of the chimney may have its cover placed so as entirely, or partially, to stop the draught through it.

"A second flue or stove, constructed exactly like the one just described, with all its appurtenances, is to be erected on the opposite side of the barn. The pens or boxes, forming the termination of each of the flues or stoves, will thus leave a passage of about two feet between them, on the centre of the building.

"These flues or stoves may be used either sepa-

rately or conjointly; it will be found best, however, always to make a fire in each, as there will then be no interval in which the heated air from the fire may not be admitted directly into the barn.

" The manner in which the heat may be regularly distributed, and applied to the curing of tobacco, is fully described in the specification of a patent for a new mode of curing tobacco, which was granted unto me on the first day of October, eighteen hundred and thirty. To the system, or modes of procedure therein described, these flues or stoves are particularly adapted; but they may also be used when tobacco is cured in the ordinary way.

" When flues are carried entirely through a barn, or drying house, the draught cannot be advantageously managed, and most of the heat is lost—a difficulty obviated by flues or stoves constructed upon the principle above described.

" What I claim, as my invention or discovery, is the application of flues or stoves, constructed upon the within described principle, by which the heated air from the fuel may be admitted directly into the barn or drying house, for the purpose of drying and curing of tobacco, whilst the smoke may be entirely excluded. I also claim the returning of the draught of the flue or stove, by means of which the draught of the fire is readily and perfectly managed, so as to produce great economy in the use of the fuel. The escape flue,

however, may be carried out at any part of the building, although not with equal advantage. It may, for example, be carried directly through the house, and yet the main object of my patent, that of admitting the heated air, without the smoke, may still be attained."

The planter will always find it better to have these flues or stoves covered with sheet or cast iron, and to have the return flues as large, or very nearly, as those in which the fires are contained. He will also find it better to have a shutter to the feeding door of each flue.

The construction or figure of these flues may be varied in such a manner as to answer the purpose for which the scaffolds are employed, or very nearly so, and thus to supersede their use. One of them, with holes in its sides for letting out heat, and sufficiently enlarged to pass all around the house, within four or five feet of its walls, has been found, by a friend of mine, to answer admirably well. The additional expense is the only objection to this variation.

Instead of constructing the flues in either of the foregoing ways, I have made them in a form still more simple, cheaper, and, so far as I have tried them, have found them to answer equally well. The following is the plan alluded to: I build a flue, the sides of which are of brick, or other suitable material, and with a covering of sheet iron; which flue I extend entirely across the house, from one side to the other. This flue or trunk may be from thirty inches to three

feet in height, and about two feet six inches in width, from end to end. It is furnished with a door at each end for feeding the fire; this being done at either or both ends, according to circumstances. Within the walls which fill up the openings at the sides of the house, and form the mason work at each end, I carry up a small chimney, to the height of about two feet, for the escape of smoke, which is allowed to pass through an opening in front, about six inches square. This opening, being at right angles with the ascending part, carries off the smoke or sparks directly from the house.

From the upper part on each side of the main flue, and at each of its ends, I carry down a small flue, opening near the floor of the barn; which opening may be stopped by a brick, or other means. These openings are for the purpose of admitting the heated air into the barn, as soon as the wood has ceased to give out smoke, which is done by merely removing the brick, or other stopper. The feeding doors should also, at such a time, be nearly closed, and the openings for the escape of smoke perfectly so.

The sheet iron used for covering the kilns may be made in three or four lengths, and be moveable, merely lying upon the walls of the flue. They will then answer for other drying houses, as they may be removed as soon as the leaf is cured, the ignited coals being sufficient to continue the heat for the curing of the stem and stalk.

SECTION II.

Of the degrees of heat or temperature, for curing—their various effects—the different states of the tobacco—and the general principle of the system.

The degree of heat, or range of temperature, that should be applied in the process, must depend upon the size and substance of the tobacco, its state, and upon the particular quality which the planter may aim to make. When it contains eight or nine leaves to a plant, and the leaves are about twenty-four inches in length, the following table of heat, with such variations as will be hereafter designated, will serve as the best guide in curing the leaf.

During the first four hours, the mercury in the thermometer should be made to rise in the most gradual manner, from its atmospherical altitude, to 100 degrees, or thereabouts. During the next four hours, it should be made to rise, in like manner, to 110 degrees, and then, in the same ratio, ten degrees for every four hours, as nearly as can be done, until the leaf is thoroughly dried. A variation of eight or ten degrees from this range of temperature will do but little, if any, mischief, unless persevered in too long; but a greater one should be promptly arrested by the

appropriate means. Removing wood from the fire is a much better mode of effecting this than opening the door.

The time that will be occupied in drying the leaf, will depend upon its substance, or the quantity of sap to be thrown off. If it should be very thin and well matured, and, of course, contain but little sap, from twenty to twenty-four hours will generally be sufficient; if otherwise, from twenty-four to thirty hours. The green tobacco, however, loses its sap much more rapidly, in proportion to its quantity, than that which is well matured, owing, no doubt, to the sap being more diluted, and the leaf more porous.

As soon as the process has commenced, the attendant should draw the thermometer towards the glass window, to see if it is within the proper limit, and regulate his fire accordingly; after which, he may watch its progress through the hole in the door, replacing the shutter after each observation. When he goes in to supply the fire with fuel, or for any other purpose, the door should be closed instantly, and secured by the inside bolt. The same precaution should be taken when returning; never suffering it to stand open a moment longer than is absolutely necessary for passing and repassing. The frequent admission of the air, when the vapor arising from the tobacco is passing through the roof of the house, is always objectionable, particularly when the tobacco is extreme-

ly yellow; by such admission, the escape of the vapor is checked, it becomes more or less condensed, and not only produces the phenomenon, called "sweating," but a chemical action upon the properties of the tobacco, which gives to the leaf a variety of shades, and very much impairs its texture.

When the leaf is thoroughly dried, the planter may, if in want of the thermometer to carry on the process in another barn or drying house, have it removed, and, whilst drying the stem and stalk, regulate the temperature sufficiently well without it. The temperature that completes the drying of the leaf will suit very well for that purpose, unless it shall be desirable to dry the stem and leaf of the same color; if so, the mercury should be made to rise gradually, in the ratio mentioned, until the stem is dried. The attendant may easily know when the leaf is dry, by examining some of the largest plants. The top leaves, from which the vapor escapes more slowly than from the others, and which are, consequently, the last that dry, should be his guide. When I speak of top or bottom leaves, it is with reference to the plant as it stands in the field. It will be found best, however, always to retain the thermometer as a guard against too high a degree of heat. Essential oils, when removed by distillation from the plants containing them, evaporate at about 212 degrees of Fahrenheit's thermometer; and tobacco, containing such an oil, although in combina-

tion with its other constituents, will lose it in part at the same, or even a much lower temperature. Repeated experiments have proved, beyond doubt, the truth of this proposition; and when it is desirable to reduce the tobacco, so as to suit a smoking market, it may be done in this as well as many other ways. Moreover, when the temperature is much too high, it will impart to the tobacco a smell of fire, which, if slight, will soon leave it; but it will also give to the woody fibre of the leaf, a stiffness or rigidity that will very much impair its value. The opinion is too common among planters, that, when the leaf is dry, but little or no injury can be sustained by the violent fires which are generally used in curing the stem and stalk; an error productive of as much mischief, perhaps, as any hitherto committed in the process. I would greatly prefer to come under the temperature which completes the drying of the leaf, than to transcend it whilst drying the stem and stalk. The time generally occupied in effecting their desiccation, is from two to three days, and is nearly the same for small and large tobacco. The small tobacco being much thinner than the large, is more liable to injuries from a high degree of heat, and should, consequently, have its stem and stalk dried by such a temperature as will accord with its comparative fineness of texture. Fine textures, of any description, receive the smell of fire much more readily than coarse ones, from high temperatures.

However, when the tobacco is parting with its vapor most rapidly, the attendant should watch the fire with much care, and see that the temperature is sufficiently high. The thermometer may probably stand much lower than might be expected from the intensity of the combustion; the reason of which is, that a large portion of heat, at such a time, is rendered latent, by entering into chemical combination with the vapor that is rapidly passing off, and thus fails to give that altitude to the mercury which it would otherwise produce. Unless the fire should be well attended to at this period of the process, the leaf will sustain some injury. It should also be watched with equal care, as soon as most of the vapor is thrown off; the heat then becomes more free, and the fire, which had just failed to raise the mercury to 120 degrees, will produce a temperature of 200 degrees, or more, which will very much impair, if not destroy, the quality of the tobacco. These facts are important, and should be well recollected.

The aspect of the tobacco, when the process is ended, will entirely depend upon its condition when the fire was applied. If it was extremely yellow and well matured before it was cut, and if its component parts have not, by exposure to the sun or a warm atmosphere, acquired too strong a tendency to decomposition or reaction, it will be as follows:

The back of the leaf will exhibit the same green

color, or very nearly, as it did before it was dried, and the whole will appear nearly transparent, when held between the light and the eye; an aspect which proves that but little, if any, chemical action has been excited or produced upon its constituents whilst its vapor was passing off, and that it retains its essential and aromatic properties in the highest degree. The preservation of the natural color of well matured plants, directly after they are dried, is generally the best test of the retention of all their valuable properties. When tobacco of this description is thus cured, exempt from any chemical action upon its properties, it will soon, through the agency of atmospherical heat and moisture, lose its greenish color, and become a fine yellow. Its yellowness, however, when it is thus changed by heat and moisture, will be in proportion to its yellowness when cut; and the tobacco will require a time to lose its greenish color, proportioned to its degree, or the deepness of its shade; when it has no shade of yellow in the field, the green color will, ultimately, be nearly or wholly lost in a dark one, and the leaf will have little or no transparency. These propositions are fully confirmed by samples now in my possession, which were cured more than a year since. If much of the leaf should not be transparent, and retain its natural color, or approach it very nearly, when the desiccation is effected, it will be evidence that the temperatures were raised too slowly, or too

rapidly, to cure the tobacco of the character just mentioned. When they are raised too slowly, it will have dark or reddish shades, or spots, particularly on the upper part of the leaves; in such places the texture of the leaf will be coarser, more spongy, have the appearance called by the planter, "grain," and will imbibe moisture more freely than the other parts of it. In those places the alkaline property of the plant has, probably, in some degree, neutralized its oil, to its injury or benefit, as the tobacco merchant may hereafter determine. The bottom leaves, which dry first, will be most transparent, and, in proportion to the advance towards that range of temperatures which would have dried the whole of the plant, exempt from any injurious chemical action, will be the quantity of this description. When the temperatures are raised too rapidly, colors nearly similar to those just mentioned will be produced, though generally darker, and much more glossy; the texture in those places will be finer than elsewhere, will receive moisture more slowly, and, in proportion to the approach towards that range of temperatures which will dry the plant of a uniform character, will be the diminution of these appearances. These effects of the temperatures should be well recollected; they will serve as important guides in the subsequent curings; when the heat is raised a great deal too rapidly, some parts of the leaves on the plants will be dried with a muddy, dingy-green color, and

most of the valuable properties of the plant will be thrown off with its vapor; consequently the rule should be rigidly observed, never to apply a greater degree of heat, or a higher range of temperatures for curing, than is absolutely necessary to bring the tobacco to the desired state and color; by this precaution, its texture will be preserved from injury. If the tobacco, however, shall have acquired, by re-action upon its properties, any additional yellowness in the interval between cutting and the application of the fires, it will be difficult to dry it uniformly transparent by any table of temperatures. If the additional yellowness on the leaf should be very slight and partial, it will ensure a yellowish piebald appearance; but if it has been allowed to become uniformly yellow throughout the leaf, it will have a uniformly reddish, or mahogany, color, after it has undergone the usual changes by moisture. In proportion to the re-action that has taken place, will it approach to, or recede from, a uniform transparency. One day's exposure to a hot sun or atmosphere, will frequently so much change the properties of the plant as to defeat the end proposed, and cause the tobacco to dry with a piebald aspect. Hence the propriety of always housing tobacco which has well yellowed in the field as soon as possible, particularly if the weather should be warm; and hence, also, the necessity of raising the fires immediately. The inequality of the action of the sun and dews on tobacco

before it is dried, renders exposure to them objectionable, particularly as all the variety of colors of which it is susceptible may be produced with much more ease and certainty in the house, where any required climate may be attained.

Tobacco that is brought to the knife in a state that the planter calls "ripening green," and of the size and substance before mentioned, will, like the yellow tobacco, when it is dried by the table of temperatures before named, present an aspect entirely dependent upon its condition when they were applied. If no change has taken place among its constituents, and they are exempt from that susceptibility of change which is generally produced by the causes before mentioned, it will, immediately after being dried, have very nearly its natural color. The face of the leaf, however, I have generally found with a faint shade of yellow. Whether such tobacco, thus dried, should be preferred to that whose properties have partially, or extensively, reacted upon each other before or whilst drying, or, in other words, have chemically changed, is a question that must hereafter be determined by the tobacco merchant and consumer. At present, a partial, or slight change upon the properties of such tobacco, such a one as will give it a variegated aspect, is preferred by them; an effect that may be produced in various ways. The following variation, however, in the table of temperatures, is preferable to all other means for producing it.

As soon as the tobacco is housed, the mercury should be raised quickly to about 100 degrees, and should be kept there until the tobacco has acquired a slightly yellowish cast; after which it should be raised in the same ratio that has been recommended for the yellow tobacco. By this mode of yellowing the tobacco, it frequently happens that some of the yellowness produced by the preparatory steaming is retained, particularly when it is very slight, before the appropriate temperatures are raised upon it. If a much lower table of temperatures than I have recommended should be applied after the yellowing, the top leaves, and those next to them, will be dried very badly, and the plant will have but little uniformity. The variation recommended in the table of heat, is admirably suited to old bottom land, or tot land tobacco, which comes to the knife with a green color. Forty or fifty hours steaming, I have generally found amply sufficient to produce the requisite changes upon the very greenest tobacco. Such tobacco, however, never can be made of fine quality by any process. If the tobacco should be larger or smaller than the size under consideration, the temperatures for steaming should be increased or diminished accordingly. 110 degrees I have found amply sufficient for the largest, and 80 for the smallest. When the weather is cool and windy, scaffolding such tobacco in the shade, (that which has a green color) will sometimes prepare

it tolerably for the requisite changes, as well as cause it to lose a great deal of its sap, which would otherwise have to be thrown off by the fire; but, on account of the uncertainty of the weather, and for the reasons before given, such an expedient should not be resorted to, unless made necessary by a want of house room, or by a pressure of business.

When the color of the tobacco, at the time it is cut, is an intermediate one, partaking of yellow and green, there should be such variations in the application of the means for producing the requisite changes in its properties, as will correspond to its approximation in color to the one or the other. When it is considerably yellow, it requires less of the means that produce re-action, owing to its greater tendency to run into that state; when it is otherwise, more of them. The following variations, in the table of heat, I have found to answer well for the intermediate colors.

When the tobacco has a very slight shade of yellow, it should be steamed by a temperature of 100 degrees, or thereabouts, thirty or forty hours, or until a visible additional yellowness takes place; after which, the table of temperatures, before named, should be raised upon it.

When it has a rather deeper shade than the one last mentioned, the same temperature for steaming should be raised upon it, but should not be continued longer than from twenty to thirty hours, before the raising of the table of heat.

When the shade of yellow is still deeper, the period for steaming should be proportionably shortened before the appropriate temperatures are raised.

When the tobacco is extremely yellow, the table of heat first named should be applied in the manner before directed.

When, however, it shall be desirable to cure any description of tobacco with a uniformly reddish or brownish color, its properties should be so changed as to give it a deep yellow hue, by any of the appropriate means; after which, it should be dried by the temperatures recommended. Crowding, and exposing it to a temperature of 80 or 90 degrees, will soon produce that state, particularly if the barn floor should be made damp or wet. A wet floor, or moist atmosphere, very much facilitates its tendency to yellow; but, as the natural juices with which the plant is impregnated, are generally sufficient to effect that state, the wetting should not be resorted to unless the tobacco should be very green when cut, as in other respects it is objectionable. When it has thus yellowed, some of its shades may be retained for a short time after it is dried; but they will ultimately be lost in a reddish or brownish color. If, after yellowing, in this, or any other manner, to the extent just mentioned, the tobacco should be dried by very low temperatures, it will become what the planter calls "sour, or tainted," and have a darkish dingy color, with coarse fibre

and swelled texture. The additional yellowing of tobacco that has matured with a yellow color, is, I think, a deeply rooted error, that has done much mischief to the planter, particularly in the making of fine Virginia chewing tobacco. Such a change, although the first visible approach towards that state of decomposition by which all vegetable matter loses its distinctive properties, may be beneficial to tobacco not fully matured; but is, I am well persuaded, always injurious to that in an opposite state.

If the tobacco should be stored away in the house more closely than I have recommended, there should be a slight increase in the temperatures for curing; if more thinly, some diminution. When it is hung very closely, it requires more heat, as the vapor escapes from it with more difficulty; and, in proportion to the quantity to be thrown off in a given space, will be the difficulty of attaining particular results—a fact that should teach the planter never to let his tobacco be caught in rain, be hung very closely, or be exposed to dews; and always to have the floor, house, and wood, as dry as possible, except when otherwise directed. The vapor arising from such sources will be more or less injurious to the tobacco; and will considerably interfere with the raising of the required temperatures—a great deal of the heat becoming latent by entering into a chemical combination with it.

If the tobacco should be larger or smaller than the

size under consideration, the appropriate variations should be made in the temperatures for curing. When it is larger, the intervals between the various points in the table of heat should be contracted; but when it is smaller, they should be lengthened, one, two, three, or four hours, according to the size of the tobacco. If both should be cured under the same process, the large or the small tobacco must unavoidably sustain an injury; they should, therefore, be separated, and the process carried on in distinct houses.

The most appropriate time for this separation is when cutting or hanging the tobacco on the sticks. The large may be placed between the rows on the right, the small between those on the left, and the middling size in the centre. By this little trouble, and the necessary attention to the laborers who hang it on the sticks, no further assortment will be required, even after it is cured, if the tobacco shall be equally good in the field; and each may get, without difficulty, its appropriate quantity of heat. This division, or separation of the tobacco into three classes, may be easily reduced to two, and sometimes to one, by dividing transversely, or splitting the largest plants into two. If, from unavoidable circumstances, this assortment cannot be made, and the house should be filled, as is commonly the case, with large and small tobacco, a medium range of temperatures for curing should be resorted to, unless the planter prefers a partial sacri-

fice of the one part, for the benefit of the other. The time of cutting will also be the most suitable one for separating, when necessary, the yellow from the green tobacco. These assortments, however, will seldom be necessary; when the crop is tolerably *even*, and uniform in color, no such trouble need be incurred.

"The difficulties which I have aimed to remove are such as have resulted from the empirical mode in which tobacco has been heretofore cured, the consequence of which has been, that the quality of the article produced has not depended upon its goodness when cut, but upon events altogether accidental; no regular system having been pursued, or understood, nor, indeed, the means adopted necessary to carry such a system into effect.

"The principle upon which I have proceeded, is, that, whenever a vegetable substance is to be desiccated by heat, in order to its being brought into a particular state, there is a certain period of time within the limits of which the process must be effected, or a spontaneous re-action of the constituents of the vegetable will take place, which re-action must necessarily prevent the attainment of the end proposed; and that there are certain limits of temperatures, above or below which we must fail in inducing the desired state. When articles, similar in their properties, are subjected to the influences of circumstances which do not vary, the result may be predicted, after it has been rigorously ascertained in a single instance.

"The means which I have adopted are such as were intended, and which experience has proved to be effectual, to place within my reach the control of those circumstances which must concur in producing the end at which I have aimed, namely, the development and preservation of all those properties in the tobacco plant, which give to it its highest value in the market."*

* Extract from the specification of the patent.

SECTION III.

The management of the tobacco from the time it is cured until delivered in the market.

In the making of fine tobacco, much depends upon a knowledge of this branch of the subject; it should, therefore, be well understood, and command the most particular attention.

When the process of curing is ended, the door and windows should be opened for the purpose of cooling the house and putting the tobacco in a state for removal. If, however, there should be need of removing it quickly, it may be taken out dry, or the barn floor may be made wet with water, the evaporation from which will soften it in a short time without doing it the slightest injury. Such vapor, if the floor shall be cleared of all decaying matter, is as pure as that which is derived from any other source.

The house to which it is removed should be open; the tobacco, if it is dried with a green or greenish color, should be stored away thinly, and should thus remain until it becomes highly saturated with moisture, or, in planters' phrase, "high in order;" after which it may be removed elsewhere, or stored away more thickly. When it is thus saturated with moisture, and the

weather is warm, it will soon lose most of its greenish color, and the properties of the plant will undergo changes by which it will acquire the usual scent of tobacco. Until these changes take place, which are produced by atmospherical heat and moisture, its smell resembles that of other recently dried herbage; these changes, however, may be produced by the artificial application of those agents. I have frequently removed the green color of very green tobacco, when it was highly saturated with moisture, and stored away thickly in a tight house, by drying it with a temperature of 90 or 100 degrees. If it should be slightly bruised, it loses its green color still more rapidly. The bruise, although it very much darkens its color, seems to fix its oil, and renders the texture and woody fibre of the leaf much less destructible. The atmosphere, however, with its heat and moisture, will generally be sufficient to effect the necessary changes upon cured tobacco.

When the tobacco is dried with a reddish, a darkish, or yellow color, it should be managed differently; it should then be removed to a tight house, stored away thickly, or laid into bulk as soon as practicable. If it is afterwards much exposed to the influence of the atmosphere and its moisture, the texture of the leaf will be weakened, much of its volatile property will be lost, the reddish and darkish colors will increase, and the yellow one will be lost in a pale mahogany

red. Nothing is more common than to hear the planter, early in the fall, boast of his fine yellow or yellowish piebald tobacco, and in the ensuing winter or spring, complain that it has all become reddish or darkish. The quantity of moisture that will be necessary for placing reddish, darkish, or yellow tobacco, in bulk, for "stripping" or packing in the hogshead, will be amply sufficient to effect all the changes in its properties which it may be desirable to produce. If, however, tobacco with these colors shall have been dried by open fires, or flues which admitted to it all the vapors arising from the combustion, it will be better to let it hang longer in the barn than I have recommended; the atmosphere lessens, in a very slight degree, the injury done by those vapors. I will here make a short digression, and speak more particularly of these effects.

When all the products of the combustion are admitted to the tobacco, it has a strong acrid taste or smell, which is generally denominated by the planter, "the taste or smell of smoke," and is believed by him to be the effect of that vapor; the opinion, however, is incorrect. The smoke or soot deposited on the tobacco may be brushed or washed off, in the most effectual manner, and yet the strong acrid taste or smell will exist. The whole of the smoke may be consumed, by flues constructed for that purpose, and it will still remain. (A flue whose draught has its exit

into the house, and passes through a metallic pipe, heated to redness by another flue, will effectually consume the smoke.) This strong acrid taste or smell is produced by the pyroligneous acid, which is evolved with the smoke in the first stage of the combustion; it insinuates itself into, and alters the properties of, the tobacco, chemically or otherwise, and is difficult to be removed by any process. When this pyroligneous acid is excluded from the tobacco, and carbonic acid, which escapes during the latter stage of the combustion, is admitted, its taste and smell are very different; its flavor is then very fine, and, perhaps, in all respects, equal to, if not better, than the flavor of tobacco from which the whole of the products of the combustion are excluded. These vapors have little, if any thing, to do with the preservation of tobacco; its oil, or, in planters' phrase, "its strength," is its principal preservative property. This I have ascertained by ample experience. "The richer the tobacco, the better it will keep," is a well settled maxim among the planters.

When the leaf is pliant, and most of the stem unyielding, the tobacco is then in a suitable state for bulking, "stripping," or prizing. The "stripping," however, may be done whilst the tobacco is in higher "order," or before it is bulked; but, generally, it will be found most convenient to do it afterwards. A house, of the following description, I have found to

answer well for bulking, and it will very much lessen the expense of barn building: The house I have used is thirty feet long, eight wide, ten deep in the body, and built of logs; the roof is of slabs or planks, and made very tight by dirt or straw put on, or in it; a door in one end, with a shutter fitting very tight, and the whole, when finished, as nearly air proof as such a building can be easily made; within it is a suitable scaffold, a foot from the floor, for bulking the tobacco on. Such a house will be found very useful and convenient in the management of the crop, and will preserve much of the valuable properties of the tobacco which would otherwise be lost.

When the tobacco is placed in bulk, the next thing to be attended to is the "stripping," or the removal of the leaves from the stalks for the purpose of being tied into bundles. The bundles should contain about six or eight leaves; the leaves in each should be as nearly of a length and color as possible, and the various sizes and colors should be kept to themselves. The yellow should constitute one class of bundles, the piebald another, the red and dark the third. If the crop, however, should be first rate in the field, and cured in the best manner, these assortments will not be needed; all the inferior will be required to tie up the good tobacco. In such a house as I have just described, the "stripping" can be carried on at any period of the winter. The tobacco may be kept soft by wetting

the floor and raising a temperature in the house, by flues or otherwise, of 50 or 60 degrees; and the necessary assortments can be made by admitting light through a small glass window. By heat and moisture, thus created, the planter may make his own seasons, produce all those changes upon the properties of the tobacco which have been before mentioned, and might, possibly, by a more extensive application of them, prepare the article quickly for consumption. The principal art in manufacturing chewing tobacco consists in the proper application of these agents, *heat and moisture*. When the manufacturer puts his tobacco under press with too much moisture in it, those agents produce incipient putrefaction, known most commonly by the names, "mould or funk," which entirely destroys the article as a luxury; when he puts it under with too little moisture in it, the heat and moisture fail to produce, in due time, that change in its properties which is necessary to correct its objectionably acrid and bitter taste; but, when he puts it under with the proper quantity of *moisture* in it, and the necessary *heat* is applied, this change quickly takes place, and the tobacco is soon ready for the market. It is this change in its properties, produced by atmospherical or artificial heat and moisture, and not by age, which gives to chewing tobacco its fine quality.

When the "stripping" is finished, the tobacco should be rebulked; the bulk should be heavily

weighted, and its sides protected well from drying weather by a tight house or some suitable covering; after which the prizing may be done at any convenient time.

There is no particular art in packing or putting the tobacco into the hogshead; it should, however, be placed straight, distributed equally, and not pressed very hard. Hard pressing causes the leaves to adhere so closely as to render the stemming difficult, and is thus far objectionable. It perhaps does no injury to the quality of the tobacco, particularly if it is intended for chewing, but most probably improves it. The effect of the press, in combination with the agents before mentioned, *heat and moisture*, in improving the quality of tobacco, is fully shown by a comparison of its opposite states. When it goes into the hands of the skilful manufacturer, it may be but ordinary, and almost unfit for use; but, when it comes out, it is frequently of excellent quality; the pressing is, therefore, not objectionable, except as regards the adhesion of the leaves. The hogsheads should contain, if intended for the Virginia market, 1,400 to 1,600 lbs.; and the prizing may be carried on in any kind of weather, even in the winter, if the planter is prepared with suitable houses for such business. It will be found best, however, to select that which is warm or moist. When the winter is ex-

tremely cold and dry, it will be most convenient to postpone the prizing until the ensuing spring.

After the crop is prized and delivered in the market, the time at which it should be opened, or exposed to sale, should next claim the planter's attention. If his tobacco is very reddish, very darkish, or very yellow, the ensuing April or May will be a suitable period; very nearly all the improvement in appearance of which such tobacco is susceptible, will have taken place by that time, particularly when it is put into the hogshead in sufficiently soft order. If, however, these colors should be considerably interspersed with shades of green, it will be better, generally, to postpone the time of selling until the next summer, or fall. By that time, the shades of green, which are now objectionable with many tobacco merchants, will be lost in a yellow, a yellowish, or darkish color, according to the particular state of the tobacco at the time it was cut; and its taste and smell will be very much improved. This change in color, &c. is effected by what the tobacco merchant calls "sweating," which is but another name for that mutual action of the constituents of the tobacco upon each other, before spoken of, produced by the summer's *heat* acting upon its moisture. The improvement in such tobacco, after prized, by this "sweating," or mutual action of its properties, produced by heat and moisture, is obvious to every observing tobacco merchant. For the want of this

knowledge, however, on the part of a number of them, it frequently happens that the article is considered inferior, sells for a low price in the winter, or spring, and afterwards commands the very highest; I would, therefore, advise the planter not to sell his crop prematurely. If the hogsheads which contain it are well dried and very tight, which should always be the case, no fear need be entertained about its safe keeping.

In concluding this section, it will be proper to observe, that the management which I have recommended, is intended particularly for the Virginia planter, and those of most of the Western States. In the States of Maryland, Ohio, and other places, the management required, after curing, is very different. In those States the tobacco is prized in very dry order, and the hogsheads made to weigh not more than from 600 to 800 lbs. Their tobacco is intended principally for smoking and snuffing, and, therefore, requires a different management; the principle, however, for curing such tobacco, is precisely the same.

SECTION IV.

The Cultivation.

This, as well as the preceding branch of the subject, is important to the planter. Unless his tobacco shall be of good quality in the field, it never can be made so afterwards by any management, or process of curing; the cultivation should, therefore, be well understood.

Having had but a short period for observation and experiment upon this part of the subject, I can say but little practically about it: but, as it is a subject full of contingencies, owing to its dependence upon the various soils and seasons, it becomes a fit one for speculation, and it will be considered, almost entirely, in that way. Before, however, entering into its details, it will be proper to premise, that every planter should make himself well acquainted with the particular market for which his tobacco is destined before he adopts any particular mode of cultivation; this he should even do as regards curing. Having this knowledge, which may be easily obtained through his commission merchant, he may vary his cultivation and curing according to the requirements of that market. This information I consider important, as the demand

for particular qualities of tobacco is more or less varying every year. The planter's object is gain; and if even such tobacco as he may consider inferior, should command the highest price, his aim should be to produce it.

Among the first things that will claim the planter's care, in the cultivation, is the preparation, or seeding, of his plant beds. The soil that should be selected for them should be rich, moist, and as dense as can be obtained; close land should be greatly preferred to that which is porous. It should be sufficiently burnt to keep down the spontaneous herbage; the ground should be well broken whilst it is dry, and the seed sown. A table spoonful, or rather more, to every thirty feet square, is generally a sufficient quantity. The most suitable time for preparing and sowing, is in the month of January and February; when the land is dry. Early and plentiful sowing should always be preferred; the success of the crop is necessarily dependent upon the success of raising plants. Covering the beds is thought to be necessary by some planters, but, by others, not. My own opinion is, that it is as often injurious as beneficial. If the land should not be very rich, manuring before or after the seed is sown, will be advantageous. The kind of seed which the planter ought to sow, must depend entirely upon the description of tobacco which he may wish to make. If he purposes to make very yellow tobacco, he should

select the seed from that kind; if very dark tobacco, his selection should be made from that description which has the least tendency to yellow in the field. The difference, however, in the various kinds in that respect is not very considerable. Either may be made to yellow more or less, by proper cultivation. Seed that is sown at the time and in the manner I have recommended, will generally produce a sufficiency of plants, of full size, to set the crop in good season. From the first to the last of May will be found the best time for transplanting, though later or earlier sometimes answers well. Very early transplanting, however, I have found sometimes objectionable. When the spring is very cool, the plants vegetate slowly, or, in planters' phrase; "start very badly." When this is the case, a more vigorous growth may be given to them by transplanting the same plants in the same hills.

The preparation of the field in which the crop is to be grown, should, like the selection of the seed, depend upon the quality of the tobacco sought to be made, and, in some degree, upon the character of the soil. If the land should be old and very rich, and the planter should wish to make large long-leaf tobacco, with coarse fibre and texture, heavy and gross in its properties, he should prepare his land well by deep ploughing, plant the tobacco three and a half or four feet apart, in the hills, prime it high enough to se-

cure the bottom leaves from dirt, top it to eight or ten leaves, and as early as the plant will bear it; keep the field clear of grass and weeds, the ground well broken, as long as the tobacco will afford room for doing so, and select such tobacco as is known to grow largest, and has the least tendency to yellow in the field. If the season should prove favorable to tobacco thus cultivated, it will grow very large, and yield abundantly in weight to the planter; but never can be made of that quality which is now considered fine. If the season, however, should prove to be dry, the tobacco will be much smaller and finer in its texture; it will also be apt to acquire a yellow color; and unless the drought should be an excessive one, it may be made of a better quality than when it is grown to a very large size. But if the season should prove to be very wet, which is frequently the case, the crop will sustain a serious injury under such a mode of cultivation. The tobacco will grow rapidly, become surcharged with sap, and before it can arrive to maturity, contract the disease, in planters' phrase called the "spot or firing." Such luxuriancy has never failed, so far as my observation has extended, to produce more or less of this disease. When it has passed into this state, it must come to the knife, whether ripe or green, and can never be made of any other than the most inferior quality. If the season, however, should be so very wet as to produce "drowning," and, of

course, a diseased yellow color, the tobacco should be cut, if it has much size, as quickly as possible, and exposed to the proper temperatures for drying it; when it has passed into this state it is not susceptible of further improvement. If it should be dried well, its texture will be fine, fibres small, the leaf thin and transparent, extremely yellow, with but little strength, though well flavored. Such tobacco will command a high price for smoking, and should not be discarded from the crop, as has hitherto been done in Virginia. It should be prized lightly, and as dry as possible, without crumbling. The luxuriancy just mentioned, and its consequences, when anticipated, may be very much controlled and lessened by suffering the suckers to remain on the plant a longer time than is usual; they will act as exhausters, by imbibing in part the juices of the plant, and must, consequently, very much diminish its tendency to disease; but if, afterwards, the planter's speculations upon the weather shall induce him to believe that the season will be dry, the suckers should be quickly removed. These speculations should be indulged more or less throughout the whole cultivation, though more particularly in relation to the topping.

Should the planter wish to make large yellow tobacco, he must select such as has the strongest tendency to yellow in the field, and which grows to a large size, and cultivate it in the manner recommend-

ed for the foregoing; with the exceptions of topping it two or three leaves higher, and working the land less after the tobacco has acquired much size. Late working, particularly if succeeded by a rain, gives new resources to the growth of the plant, and is too apt to produce that morbid luxuriancy, and its consequences, before mentioned; it but seldom fails to prevent yellowing, so indispensable to the making of the kind of tobacco under consideration. The soil should not be broken after the tobacco has pretty well covered the hill. The grass and weeds, which may be likely afterwards to interfere with its growth, may be scraped off in the lightest manner. By this mode of cultivation, the planter will seldom fail in producing the yellow color, particularly if the land is well suited to the tobacco, and the plant should possess the slightest inherent tendency to that state. This mode, however, will probably be objected to, from a belief that the plant will be poor, and never acquire sufficient size; my experience and observation compel me to think otherwise. I have known plants to spring up as if they were spontaneous, grow luxuriantly, and to a large size, even when very much shaded, without having, at any period, a particle of soil stirred around them. Such facts prove the strong adaptation of the American soil to tobacco—the one in which it is indigenous—and suggest the probability, that it requires much less aid from cultivation than is generally sup-

posed; when it is in its natural soil, few plants are more tenacious of life, or more capable of self-preservation; its broad and long leaves protect the soil from which it is supported, keep it moist and soft, and render it, when the plant has attained much size, unproductive of the ordinary spontaneous herbage. The following experiments in the cultivation give additional weight to this suggestion, particularly as regards the cultivation of light, porous, new land.

In the year 1806 I had about 200 tobacco hills, made upon land which had never before been cultivated; the ground was well broken, all the roots removed, the tobacco then planted and cultivated in what, in Virginia, is called the best manner. The soil was kept light, and clear of grass and weeds, throughout the season. In a similar soil, and exactly by the side of the former, I had small beds, or chops, made, a little exceeding, in circumference, the size of a common hat. They were very little elevated above the surface of the ground, and were about three feet and a half apart. The hills just mentioned were also about the same distance apart; and the whole, the hills and beds, were planted on the same day. The number of beds 800. The latter had two workings, and the tobacco, in other respects, was managed like that in the former. The first working of the tobacco in the beds, consisted in drawing a small quantity of dirt to the plant, from the unbroken ground between the

rows. The second and last working, consisted in the same operation, though more extensive. By these two workings, all the unbroken land was stirred. The last one was given about the time, or a little before, the tobacco came into the top, and before its roots could meet with much resistance from the unbroken soil. That which was in the beds grew off somewhat faster than that in the hills, owing, probably, to its being nearer to the surface of the ground, from which it imbibed moisture more rapidly than that in the hills; but when each arrived at maturity, there was so little difference between them in size, color, &c. that the one could not easily be distinguished from the other. The experiment was renewed in the subsequent year, and followed by the same result. By the ordinary mode of cultivating new land, it is broken several times, and all the roots removed before the hills are made. By the mode of beds, much of that labor is saved, and the land less exposed to injury from hard rains, and the exhausting influence of the sun. If the roots and litter of the forest were suffered to remain, and the land broken only as the roots of the tobacco require it, many of these injuries would be prevented. The principal objection, perhaps, to cultivating new land in this manner, is, that it requires much more labor after the crop is planted, and its principal recommendation, that it requires much less before it is planted. It will, at least, suit

such planters as may want time to prepare their land in the ordinary way. The roots and decaying matter in the new land, will, in some degree, perform the offices of the plough, as well as afford nourishment to the crop; they keep the soil light and porous, and always in a state to receive and give out moisture. This mode of cultivation is worthy of further trial.

If, on very rich land, whether old or new, the planter should wish to make short leaf yellow tobacco, his mode of cultivation should be widely different from that recommended for the other descriptions. The tobacco selected for cultivation should be such as has naturally the smallest leaf, stem, and fibre, and will yellow easily in the field. It should be planted about three feet apart, and in tolerably high hills, worked but little, and that very early, topped high, and *primed*, so as to secure it from dirt. The topping is much the most delicate part of the cultivation. If the plant should be very luxuriant, so much so as to make it probable that it will attain too much size and grossness, it should be suffered to blossom, or nearly approach that state, before the bud is taken out. From ten to sixteen leaves will embrace the various sizes, after the plant is *primed;* and the bud that is taken out should always be a large one, even if it reduces the plant to a less number of leaves than is recommended. By suffering the plant to remain until such a bud can be procured, its watery properties will be

less abundant, the leaves will be further apart, or, in planters' phrase, the stalk will become "long jointed;" they will be small, have a fine texture, and will seldom fail, if the season is tolerable, to acquire that yellowness and maturity which is all-important to the good quality of the article. The leaves of the plant will stand more erect than when topped otherwise, and seem much impoverished, though, perhaps, not really be so. Such tobacco, when it is dried and managed in the best manner, seldom fails to command a very high price. After such topping, however, if the season should become very dry, and the plant not likely to sustain itself, as many of the top leaves as may seem necessary should be taken off, when the laborers are removing the suckers, or making the subsequent toppings. The removal of the top leaves should always be preferred to those on the bottom; they are smaller, equally, or more, convenient, and more remote from maturity. A belief that such topping will retard maturation, and expose the crop to the hazard of frost, may, perhaps, be urged as an objection to this procedure. A short experience induces me to think otherwise. The difference in the period of time required for the ripening of that which is topped, by the removal of a large bud, and that which is topped by the removal of a small one, is too inconsiderable to make it a matter of any consequence. The small bud may be removed a week sooner than the large one,

and yet the plant losing the large one will come to the knife as soon, or very nearly so, as the other: this I have ascertained by repeated experiments. How such topping produces such an effect is not easily explained; nor is the knowledge of it of any consequence to the planter, so that the fact be clearly ascertained. The complicated operations of nature, in relation to the growth and production of vegetable matter, are too little understood to afford an explanation. The greater facility with which such tobacco receives the air, light, heat, and moisture, and with which it parts with its watery property, is most probably the cause. Such tobacco produces but few suckers, and, consequently, the labor of cultivation is very much lessened. Unfortunately for the art of growing fine tobacco, too many of its cultivators entertain the opinion that it should be grown very large, have long, broad, thick leaves, overflowing with sap, and of a deep green color, or very nearly so, when it is brought to the knife; forgetting that all this redundancy must be thrown off by the process of drying, and that the plant is to be left a mere skeleton of stalk, stem, and fibre. Such tobacco, when dried, is coarse, porous, badly flavored, and has but little essential oil; the alkaline property is much more abundant, and the tobacco, thus far, objectionable. The principles recommended for the cultivation of rich land, old or new, will, by making corresponding variations, be ap-

plicable to all the different grades of soil. When the soil is poor, the topping should be lower, and the working of the ground more considerable. A close, dense soil, although it may be rich, requires much more stirring and labor than one in an opposite state.

If the planter should wish to cultivate his crop in such a manner as to make smoking tobacco, he should very nearly reverse the method recommended for the cultivation of the large, dark, or yellow tobacco. He should select such as is known to contain the smallest quantity of oil when it is matured, which grows rapidly, yellows speedily, and has a fine fibre and texture. He should crowd it in the field, top it very high, not *prime* it at all, work it very little indeed, particularly after it has acquired much size, and cut it as soon as it has attained full growth and sufficient yellowness, without regard to further maturity. If the land should be very rich, and likely to grow the tobacco so luxuriantly as to prevent it from yellowing, it should not be worked at all after the tobacco has pretty well covered the hills. When it is thus left to struggle with the weeds and grass, the necessary yellowing is more apt to be produced. I have been informed by a gentleman of intelligence residing in the State of Ohio, and who is a large dealer in the article, that it is by this mode of cultivation that their finest yellow tobacco is grown, particularly when it is planted on new land. Such tobacco, when it is well cured, and

afterwards properly managed, commands, in the Baltimore market, a very high price. The tobacco is generally known by the name of the Maryland yellow kite-foot. If the season, however, should be unfavorable, and the tobacco not likely to become sufficiently yellow before it acquires too much strength and coarseness, it should be cut in its green state. When it is cut in this state, and afterwards yellowed by the appropriate means, it may be dried with a bright reddish color, and made to command a good price in a smoking market. Those whose crops are likely to be taken by frost, would do well to adopt such an alternative. Under this mode of cultivation, the objects to be attained are, to grow the tobacco with as little strength, or oil, as possible, to give it a deep yellow color, a fine texture, and small stem and fibre. When, however, tobacco is intended for other purposes than smoking, particularly for chewing, its state of maturity should be widely different from that just mentioned: it should not only be ripe, and arrive to its extreme growth, but it should remain in the field until most of its watery property is lost. When tobacco is well matured, the leaf will be more transparent than when it is otherwise, somewhat brittle, a little uneven upon its surface, and the whole plant will have, in some degree, the appearance of wasting. Yellowness, closeness of texture, a loss of the downy surface of the leaf, and transparency, are the best evidences of

full maturity. When the plant is in this state, its properties are well proportioned, and it is susceptible of being dried of a fine quality. If it shall be cut before much of its watery property is lost, the process of drying will be much more difficult, and perhaps some of its valuable properties will be thrown off with its vapor, which would otherwise be retained. It should, therefore, instead of acquiring weight, or, in planters' phrase, " be gaining," always be losing it at the time it is cut. When it is redundant with juices, or watery matter, its properties are badly proportioned; and I am fully convinced, from ample experience, that such tobacco can never be made of fine quality. The remarks which have been made in relation to the cultivation of smoking tobacco, are intended only for the particular qualities that were mentioned. Most of the markets, perhaps all, require some of their smoking tobacco to be strong, and as well matured, as possible, before it is cut.

The cutting of the tobacco is simple, and needs no particular directions. After it has been cut, however, it should be removed, as quickly as possible, from the influence of the sun, particularly if the weather be warm, and hung upon the sticks, in the manner that has been directed. When this cannot be done, it should be closely covered with bushes whilst on the scaffold, or in the heap; but as it spoils very quickly when heaped together, it should not long re-

main in that state. Cool, cloudy, or windy days, should, if practicable, always be selected for cutting. When the heat of the sun is considerable, and the ground very hot upon which the tobacco must necessarily be placed, the exposure of it one or two hours will frequently so much change and injure its properties as to render it unsusceptible of being cured of good quality. It should, therefore, in such weather, be always removed to the shade before it has become perfectly limber, or, in planters' phrase, "well fallen." The operation of the sun on the plant, is always unequal, fluctuating in its force, and must, necessarily, be more or less prejudicial to it.

In concluding this section, I will remark, that the opinion is erroneously entertained, that fine yellow tobacco cannot be produced unless it is grown upon new land. I have occasionally seen the very best quality produced upon old land, that was dry, and very rich. Such land is well suited to the production of the article, and will, under the influence of a favorable season, and a proper system of cultivation, grow the tobacco to a full size, make it yellow, give it a fine texture, make its most valued properties abundant, and, I have no doubt, will proportion them as properly as in tobacco grown upon new land. When a plant of tobacco has been thus grown and matured, it will be of the best quality; and in estimating its value, no regard should be paid to the soil which pro-

duced it. In new land, however, that is rich and dry, the article will produce, of fine quality, with more certainty than in that of opposite descriptions, and it should always be preferred. The best lands which I have ever seen for the growth and production of fine, large, yellow tobacco, is to be found in the *barrens and prairies* of the western part of the United States The soil is rich, light, and dry, and seldom fails to grow the tobacco with a fine texture, and yellow color. Notwithstanding these advantages, the article, in that country, with occasional exceptions, is of an inferior quality, evidently owing to the want of a proper system for cultivation, curing, &c. When such a system shall have been adopted, there cannot be a doubt but the tobacco of the West may be brought into a fair and full competition with that of Virginia, or of any other State.

The following extract, from the claim attached to the specification of the patent granted for the system, contains the principal claims under that patent:

"I do not claim the use of a thermometer for the purpose of merely ascertaining the temperature of a room, but, as it has never before been employed as a means for carrying into effect a system of curing tobacco, upon the principles described, I do claim the use of the thermometer, or of any analogous means of regulating the temperatures, upon the principles, and for the purpose, herein designated. It is, indeed,

possible to conduct the process without the use of a thermometer, although less perfectly than with one; a man, by habit, might judge of the temperatures, and would, in my estimation, as actually violate my right without, as with, the use of this instrument.

"Scaffolds may have been used for the purpose of defending the tobacco from the direct action of, and danger from, open fires; to such, I do not assume any claim—but I do claim the erection of scaffolds for the purpose of diffusing the heated air, so that an equable temperature may be preserved in every part of the house, (or a near approach made to it) the same being essential to the curing of tobacco upon my system."

THE END.