

Flax Culture in Lancaster Co.

The last paper I had the pleasure and privilege to present to this learned organization was entitled, "One of the Lost Industries of the Octorara Valley," and related to the manufacture of charcoal sixty years ago. In the present paper I propose to present another of the lost industries, as it was practiced seventy-five years ago. I refer to the growing and manufacture of flax into its various products in the region above referred to; and, believing that the time is not far distant when those who have participated in this industry will have passed through the gates ajar, I have been impressed with the present duty of preparing this tribute for the archives of the Lancaster County Historical Society.

The plant commonly denominated flax is known to scientists by the Latin name *linum*; the German name, flacks; the French name, lin; the English name, flax or lint. Dr. Asa Gray, the great American botanist, gives this herbaceous plant a place in his 26th Order Linaceae, or Flax Family, under the Genus *Linum* and Species *Usitatissimum*, and it is described as an herb, with regular and symmetrical hypogynous flowers, four-fifths merous throughout, strongly imbricated calyx, and convolute petals; the five stamens monadelphous at the base, and eight to ten-seeded pod, having twice as many cells (often incomplete) as there are styles. The herb has a tough, fibrous bark, simple and sessile entire leaves, alternate or opposite, without stipules, often replaced with glands, and with corymbose or paniced flowers, the corolla usually ephemeral.

Three species of this family are indigenous to the Northern States, the *Linum Virginianum*, *Linum Boota* and the *Linum Rigidum*, and three species, including the *Usitatissimum*, are exotics. The *Perennea* and *Grandiflorum*, the former with pale blue flowers and the latter with its showy red or crimson flowers, are often cultivated in our gardens, and bloom the entire season. All of these species are annual. The seeds of the flax plant are small, flattened, ovoid-shaped, 1-16 by $\frac{1}{8}$ of an inch in diameter, dark brown color, with a smooth, shining mucilaginous coat, and flat, oily cotyledons, from which linseed or flaxseed oil is obtained, and largely used in painting and for other purposes in the arts.

The cultivation and manufacture of flax is, doubtless, the most ancient textile industry for clothing, except the figleaf, and is cotemporaneous with the stone age. The cultivation and manufacture of flax into garments, bedding, ropes, nets for fishing and catching wild animals, dates from the earliest history of the human family, and frequent mention is made of fine linen by both sacred and profane historians.

Egypt especially was famous for fine linen. All of the Egyptians were arrayed in garments of fine linen, and the Priesthood were required to each wear a vesture of fine linen. From Egypt and Palestine the cultivation of flax and manufacture of linen gradually spread over Central and Northern Europe, including the British Isles. Asia also engaged in the production and manufacture of this textile, and, although Russia grew great quantities of flax, and Belgium was celebrated for flax of fine texture, yet Ireland excelled all other lands in the manufacture of fine linens, and Irish linen was in great demand. Dr. McCosh, himself a Scotchman, avers that it behooves a Scotchman to be right, for, if wrong,

no power on earth can right him. This is largely true of the Scotch-Irishman, and, in accordance with this trait of character, when these people emigrated to America, they brought with them their industries, customs, habits and beliefs, and with them came the potato, which had been introduced into Ireland, along with tobacco, in 1586, by Sir Walter Raleigh. Along with the potato came flax, with the spade for the potato and the scutching knife, the hackle, the spinning-wheel and the loom for the flax.

These were meritorious and commendable industries, but, with these, others also came not belonging to this class, chief among which was the distillation of Irish whisky and peach brandy, the imbibition of which led to many a miniature Donnybrook Fair.

In obedience to their early teaching, these Scotch-Irish settlers, of which nationality (if we may so use the term) the pioneer farmers of the Octorara Valley were largely composed, some English Friends, and a few Germans all felt the necessity of raising a crop of flax, to furnish clothing of certain kinds, household trimmings, bedding, table linen, bagging and many other necessary articles. and, in accordance with this impression, planted from one-half to three acres of flax for domestic purposes. The cultivation and manufacture of flax continued from the days of the pioneers down to the middle of the present century. The industry was probably at its highest period of evolution about 1820, but the cheaper production of cotton goods, by means of slave labor, gradually drove the linens out of competition, and in 1850 had entirely ruined the industry. In the days of the pioneer farmers the cultivation and manufacture of flax consisted of the following process: First, planting; second, pulling; third, rippling; fourth, retting or rotting; fifth, breaking, scutching and hack-

ling; sixth, spinning, and seventh, weaving. Each process will be taken up in regular order.

In the spring season the ground for the flax plot was carefully selected, freedom from weeds being a requisite; it was thoroughly plowed, rolled and harrowed, until the surface earth was fine and level; then the seed, three bushels to the acre, was sown broadcast, and covered either with short-toothed harrows or with hand-rakes, even a brush drag being used; it was then again rolled to settle the earth around the seed, and thus promote germination. Thickly-grown plants on thin soil conduced to the growth of a fine fibre, which gave value to the plant. The plants ranged from one and a-half feet to three feet high, and when in full bloom the plot or field was certainly a most beautiful floral display, of bright blue flowers, hiding from view the stalks and leaves.

The next process in flax cultivation was the pulling. As soon as the crop was ripened sufficiently to color the seeds brown, the entire family of the owner capable of pulling, and many of the neighbors, especially the young folks, entered the flax plot, and pulled the stalks up with the roots attached, if possible selecting a time when the earth would readily yield to the withdrawal of the plants. As pulled, it was tied up in small sheaves, or bundles, using flax for the band. It was then stood up in stooks, or shocks, until the entire crop was harvested, when it was hauled to the barn, on the floor of which the rippling process was inaugurated. This process consisted in the removal of the seed bolls, or capsules, containing the seeds. This was accomplished by beating the hands, or small bundles of the flax, over large stones or blocks of wood, or by means of a large iron comb, with teeth five inches long. The hands

were pulled through the comb, thereby leaving the stalks free from seed bolls and leaves. This operation was performed by fastening the comb to a block of wood, elevated, so that the operators could be seated. A man on either side of the comb would alternately draw a hand of the flax through the comb. These combs were also used to draw the seeds off broom corn. The seed bolls were then gathered up and either threshed with a flail or subjected to crushing by means of a small roller. The seeds and the capsules were then separated by means of a winnowing fan, and the seeds were then ready for the oil mill. The ruins of these old oil mills are yet found in the Octorara Valley, notably one on the farm of David Jones, one-half mile south of Steelville.

The stalks, freed from seeds and leaves, were then ready for the retting or rotting process. Two modes of retting were in vogue. One, by immersing the stalks in a pond of fresh, clear, running water, free from iron or lime. The other mode by dew, rain and sun retting. In the water-retting process, the stalks, tied in bundles, were stood upright, roots down, in such a manner as to admit of free circulation for the water and escape of the gases evolved. The entire crop was packed in this manner in the water pool, covered with straw and weighted down with stones, to keep the stalks submerged. In a few days fermentation commenced, gases were given off, and in two or three weeks, depending upon the temperature, the fibrous bark began to separate from the woody centre, the plant being exogenous in character.

The plants were then removed from the water bath, and dried by being spread out and exposed to the sun's rays. When thoroughly dried, they were ready for breaking.

The dew and sun process consisted in spreading out the stalks in some lawn-like situation, gently sloping to the south, if possible, the stalks remaining exposed to the sun, dew and rain for weeks, and being turned frequently, to facilitate the retting process, which was important. After the fibre began to separate from the woody centre the stalks were tied up in bundles and were then ready for the breaker. Thorough retting contributed to fine fibre, which enhanced the value of the flax, and the examination of the retting was conducted by experts.

The breaking was accomplished by a machine, especially constructed for this purpose, but frequently inquisitive boys had their fingers pinched by it, as I can testify to my individual experience in this line.

The breaker consisted of a heavy wood frame, 5 feet long and 1½ feet wide, the sides and end pieces being 4 to 5 inches square, supported by four feet two and one-half feet long. Lengthwise in the centre of the frame, and attached to either end, were five hard-wood boards on edge, five inches wide and one inch thick, parallel with the side pieces and each other one inch apart, with a rounding bevel on the top edge. Hinged by wooden hinges to this frame at one end was another vertically-moving frame, which consisted of two end pieces, supporting four five-inch hard-wood blades, five inches wide and one inch thick, beveled as the stationary blades, and so adjusted as to fit into the interspaces between the stationary blades. The movable frame was operated by means of a wooden rod extending from one end of the movable frame to the other. The upper frame being raised, a hand of flax was thrown across the stationary blades and the movable blades were forced down between the stationary blades, thus breaking the

stalks. This process was continued, reversing the ends of the flax stalks until the woody centre was broken into shives, pieces about one inch long. The flax was then ready for scutching. This part of the labor was generally performed by women, as, indeed, were all the after manipulations, until manufactured into cloth. The scutching was done by so holding the hand of flax as to hang over the rounded edge of an upright board, either attached to a heavy block or inserted into the ground, when operating under friendly shade trees, when repeated blows by means of a two-edged wooden knife, three feet long and four inches wide, the knife slanted downward along the board, striking the broken flax at an acute angle, removed the woody parts of the plant; some of the fibre was also removed, and was known as codilla, or scutching tow, and was used in manufacturing cordage.

After all the reedy part of the plant had been removed, the flax was then ready for hackling, or hatcheling. The hackle was composed of eight to ten rows of pointed iron spikes, with eight to twelve in each row, all set in a wooden block one-quarter of an inch apart. The hackle was fastened to a slab bench of suitable height so that the operator could be seated. The hand of scutched flax was then drawn through the spikes of the hackle many times until the fibres became fine and silky. The short and coarse fibres were removed by the hackle, and this was known as hackling tow, which was manufactured into tow linen for men's wear. A new suit of tow linen, well starched, was something to be proud of, and the owner would don the suit on special occasions and on Sunday, and looked quite nobby, as he, with others, gathered in the churchyard before service to talk over the events of the week. The hackled flax was twisted into rolls and laid aside

ready for spinning, which process consisted in drawing the flax into twisted threads of various degrees of fineness, as required by the texture of the proposed goods to be manufactured and the expertness of the manipulator, whose tactile development of the thumb and forefinger of the left hand was no less than wonderful.

The spinning wheel was nothing more nor less than a complicated high-g geared twisting machine, and consisted of a bench, one and one-half to two feet long, six to eight inches wide, and two inches thick, supported by three or four bracing feet. Two uprights near one end supported the axle of a wheel, which was 18 to 20 inches in diameter, with hub and radiating spokes supporting a three-inch-deep rim, or felloe, one-half to three quarters of an inch thick, grooved on its periphery to admit a cord or band one-eighth of an inch in diameter. This wheel was operated by means of a treadle and crank. On the other end of the bench was attached a sliding board, held in position by a screw or wedge, to which board were fastened two uprights, which supported the flyer on a spindle, on which was a small grooved pulley, one and one-half inches in diameter, over which the driving belt ran, and gave motion to the spindle, which was composed of two half-round pieces of steel, attached to each other at either end, but separated in the middle, to permit of some outward spring. The flyer consisted of one-half of a wooden circle, the convexity facing the operator, and attached to the near end of the spindle along the limbs of the flyer were several hooks, over which the twisted thread ran, admitted through an opening in the end of the spindle, as it was delivered upon the spool on the spindle. This spool was three inches long and two inches in diameter. The spool re-

volved upon the spindle, held in situ by friction produced by the spring of the spindle, so nicely adjusted that while twisting the thread the spool was held stationary until ready to reel up the thread as soon as the tension of the thread was removed. Thus the spool was alternately at rest and in motion.

After a sufficient number of spools to form the warp or chain were filled with thread the operators were ready to begin the weaving process, other spools being retained for the woof or filling, which was wound upon shuttle bobbing. It was an interesting sight to see six or eight matrons and maidens, all in one room, operating their spinning machines, or spinning wheels, as they were termed. The spinning wheel and side saddle were as necessary to the complete outfit of a young lady seventy-five years ago as a piano is to the young lady of to-day, and these well-developed, rosy-cheeked, healthy maidens could sing to the music or hum of the spinning wheels as our young ladies of to-day do to the tones of the piano. It is true the music was not operatic then, as now, but "Bonnie Doon," "Mary's Dream," "The Deep Blue Sea," "Annie Laurie" (old version) and "Kitty of Coleraine" were favorites, especially the latter, which, although imported from Ireland, was applicable to their adopted land. As but few of our members are conversant with the song, I have taken the privilege of presenting it:

KITTY OF COLERAINE.

As beautiful Kitty one morning was tripping,

With a pitcher of milk, from the Fair of Coleraine;

When she saw me she stumbled; the pitcher it tumbled,

And all the sweet buttermilk watered the plain.

Oh! what shall I do, now! It was looking at you, now!

Sure, sure, such a pitcher I'll ne'er see again;

'Twas the pride of my dairy. Oh! Barney McLeary,

You are sent as a plague to the girls of Coleraine.

I sat down beside her, and gently did chide her,

That such trifling misfortune should give her such pain;

A kiss then I gave her, and ere I did leave her,

She vowed for such pleasure she'd break it again.

'Twas haymaking season, I can't tell the reason—

Misfortunes will never come single 'tis plain;

For very soon after poor Kitty's disaster There was not a pitcher found whole in Coleraine.

These girls not only operated spinning wheels, but planted corn, made hay, assisted in harvesting, and also indulged in those back-breaking exercises of gathering apples, picking potatoes, heaping up stones, and many other kinds of outdoor work, which developed them physically and mentally, fitting mothers for the present generation, distinguished for brawn and brain.

The weaving was done upon a loom, 4½ to 5 feet square. There were four corner posts, bound together by cross-ties, a beam for the warp, another for the woven goods, a pair of heddles, one swinging baton beam, which contained a weavers' reed, and a shuttle track. The shuttle was 12 to 15 inches long, 1½ by 2 inches square, and hollowed out to admit of a bobbin filled with thread.

The first act in weaving was to prepare the warp, which was done by stringing the spinning wheel spools on a wire frame, and winding the thread off the spools on the warp beam by turning it around and drawing the

thread off the spools, distributing it evenly over the beam by means of a reed. When the warp had been transferred to the beam, the ends of the threads were drawn through the eye of the heddles, alternately. The threads were then passed through the reed, in the batten frame, and attached to the cloth roller. The heddles are moved vertically, by means of treadles, and, as they move up and down, alternately, a triangular space is opened between the alternate threads of the warp, through which the shuttle passes, leaving a thread in the opened chain, which is then driven up against the cloth previously woven by means of the batten reed. Then the other half of the chain is depressed, the shuttle returns through the opening, leaving another thread in its course, which is also driven up against the woven goods, to become a part of the fabric. This process is continued until the entire warp is filled with the woof, and the cloth is finished. It is then removed from the loom, and, when the goods were intended for bed linen, table cloths and shirting, subjected to the bleaching process.

Bleaching was accomplished by steeping the goods in a solution of wood ashes lye for a few days, then washing them and exposing them to the sun's rays for some time. The goods were then placed in a vat filled with buttermilk. After a time they were again treated to the lye bath, to the sun's rays and the immersion in the buttermilk in this order, until the required freedom from color had been obtained. The hackling tow was subjected to the spinning and weaving processes, but rarely bleached, and was made into gentlemen's outer garments in its natural color. A heavy grade of tow linen was made into Conestoga wagon covers, bagging and straw bedding. The scutching tow was used

to make ropes. Every hunter had a supply on hand, to clean his muzzle-loading gun, and even used it for wadding, as paper was a scarce commodity in those days.

The last process I desire to call your attention to was the expression of the linseed or flaxseed oil from the seeds. The seeds were ground or crushed by means of a conical stone, 4 feet long, 1½ feet in diameter at the base and 10 inches at the apex of the cone. A hole was drilled lengthwise through the stone, and a shaft passed through. There was a smooth stone, or hardwood bed, circular in form, with upright in the centre; to this upright the apex end of the shaft was attached, admitting of a circular sweep of the shaft and stone around the circular bed, by means of a horse attached to the outer end of the shaft. The flaxseed was spread over the bed and the revolving cone crushed the seeds as it moved around the circle. After the seeds were thoroughly crushed they were placed in large kettles, with sufficient water to admit of boiling. The oil, being of less specific gravity than the water, rose to the surface, and was skimmed off the water, then placed in vats, and, after cooling, was drawn out of the vats, and was ready to be used in the arts and medicine. About thirty per centum of the weight of the seeds was obtained in oil. The residue was subjected to heavy pressure, the oil and water forced out of the resulting mass, which was known as oil-cake, and was fed to cattle. Sometimes the oil was extracted from the seeds by pressure, and was known as cold-drawn linseed oil.

I would not have you infer that the cultivation and manufacture of flax was confined to the Octorara Valley, for this industry extended over the entire Northern States, and doubtless the

processes for the growing and mode of manufacturing were much the same. I have only collected the early pioneer methods, and presented them as they existed seventy-five years ago. Later some of these manipulations were improved upon, but the history of the manufacture of flax in 1825 is substantially as here given, and, although three-quarters of a century has passed away, yet, even now, you can find table and bed-linen in the households of many of the descendants of the first families of the Octorara Valley which was manufactured by their grandmothers, as above described. These old linens are justly treasured as heirlooms, and destined to descend to future generations.

During the period of the Civil War, when cotton goods had advanced 1,000 per cent. in price, a spasmodic attempt to grow flax was made in the Northern States, but upon the restoration of peace the effort was abandoned, as cotton goods were again so reduced in price that flax could not compete in the market. A few years since an attempt was made in some localities to grow flax for the seed alone. The crop was harvested with reapers, no value being attached to the fibre. But the enterprise was not remunerative, and, consequently, was soon abandoned.

In conclusion, I desire to appeal to the citizens of our good old county of Lancaster who are interested in the patriotic and educational work being done by the Lancaster County Historical Society, and who have in their possession articles that they can contribute, illustrative of the agriculture, the manufactures, the literature and the history of Lancaster county. In fact, anything that can be used in building up a museum, exhibitory of the story of the industries of the past generations. We hope in the near future, through the generosity of

liberal-minded citizens, to be able to erect a suitable building, for the preservation and exhibition of such donations. Contributions along this line, or in Mr. Brosius' National currency, may be sent to any of the officers of the Lancaster County Historical Society.

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