

The Romance of Leather And Its Importance to Mankind

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INSTALLMENT 2

WHEN America was discovered, the settlers found the Indians well versed in the art of tanning. They used leather for many purposes, chiefly for clothing, tents and canoes (although they also made canoes of other materials).

How Indians Made Leather

All the leather made by the Indians was the famous "buckskin tan", a leather of exceeding softness and pliability, and remarkable for its ability to keep out water. The Navajos were especially skillful in dressing hides and ornamenting leather, but the Crow Indians were generally considered to have the best tanning method. The work of skin-dressing was largely, if not entirely, done by the Indian women. Skins were collected and heaped in piles, wetted, and allowed to decompose until the hair was loosened. Then they were scraped with bone tools until both the hair and flesh sides were perfectly clean. After that the skin was rubbed with a mixture composed of the brain and liver of the animal, and later softened by thorough rubbing.

Among the Crows, however, the dehairing and scraping were preceded by the immersion of the skins in a lye solution made from the wood ashes of the campfires. As a final step in their process, the skins were placed in a tepee in which a smudge-fire had been built. The tepee was then closed as tightly as possible and the skins were left in this smoke-filled tent for several days until all had been thoroughly cured. The leather so made would withstand any amount of wetting and return when dry to its original soft and pliable condition.

Although the Indians made an excellent leather, they knew nothing of the types produced by the superior method of bark tanning, known to Europe for so many centuries, and introduced, naturally enough, by the new settlers. The first tanner to come to America of whom there is any record was Experience Miller, who came to Plymouth in the good ship *Ann* in 1623. He was followed, five years later, by two shoemakers, Thomas Beard and Isack Rickman, who were evidently sent over by the Plymouth Company, for they were to receive "their dyett and house room at the charge of the companie". It is also recorded that Beard had in the ship "divers hydes, both for sole and upp leathers, he intends to make upp in boots and shoes".

Early Colonists

Leather, of course, played a large part in the life of the Colonists. The woodsmen and frontier settlers used leather clothing, very largely made by the Indian "buckskin tan", and often enough cut in the Indian patterns; the woodsmen themselves were commonly called "Leather-stockings" from this mode of dress. In the settlements, leather knee-breeches and jackets and coats were very popular. The high boots so necessary in days when roads were muddy or were snow-filled trails were, of course, made of leather, as were their square-toed shoes. Saddles were in great demand, and the first-rate

saddlers were fine artisans. In the later colonial period the sedan chairs and coaches were upholstered in leather (and sometimes covered with leather, richly ornamented, on the outside). The early coaches were hung on wide, tough leather straps instead of springs. Post-riders carried leathern bags to protect letters and newspapers from the rain and snow, and every traveller had his saddle-bags of leather. The wide cordovan belts worn by pirates and sailors were probably worn for protection, as a sort of body armor, in hand-to-hand fighting with swords and rapiers, and their magnificent cavalier boots may have been designed to serve as similar protection.

First Scientific Developments

Up to the latter part of the 18th Century, no one had made a scientific study of tanning processes. For many centuries leather was tanned by methods as old as the records of the Hebrews and Egyptians, each tanner following a rule-of-thumb process, and perhaps adding some slight variation of his own. Only one method was followed for practically all leathers. Hides were first put in a "soak" of lime and water. After the hair was scraped off, they were laid in crude boxes or vats made of rough-hewn planks. Ground oak-bark was sprinkled over each layer of hides, and when the vat was full, water was poured in to cover them. They were then left to soak for six months or more. Occasionally the hides were removed and freshly packed with ground oak-bark. Such was the method used nearly everywhere, tanners drawing on the resources of their immediate neighborhood for raw materials, and in turn supplying their neighbors with the finished leather. It was thus a small, almost entirely local business.

Towards the end of the 18th Century many changes were made in industry through scientific knowledge and experiment (a period usually referred to in history as the Industrial Revolution).

Leather-making, like many other crafts, began to change from a small, local handicraft, dependent upon immemorial practice and limited to local resources, to a great industry, based upon scientific method, and highly organized, with machinery doing away with much of the slow, laborious hand labor. With the aid of new discoveries tanners began to produce a great variety of immensely improved leathers. Some of the steps in this change are as important as many of the more famous inventions and discoveries of the last two centuries.

Among the earliest contributions was the work of Sir Humphrey Davy, the noted English scientist. Until he published the results of his experiments, oak-bark was almost the only vegetable tanning agent known, although sumac leaves and nut galls as well as certain oriental trees, not readily available to tanners, had been occasionally used. Davy established that oak-bark was valuable for the tannin it contained. He discovered, also, that resources of tannin might be had from many other trees. Tannin was present in the bark of the hemlock and mimosa, the wood of the chestnut, the quebracho and oak trees, the fruit of the divi-divi, valonia and myrobalans. Sir Humphrey's work was of vast interest to American

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tanners, for our forests were full of hemlock and chestnut, and the tanning industry could thus be sure of a large supply of tanning materials.

Chrome Tanning Discovered

The most revolutionary discovery of the 19th Century, as far as leather manufacture is concerned, was the development of chrome tanning. Tanning with alum had been one exception to the use of vegetable tanning agents, but the usefulness of that process was limited, and only small quantities of leather were tanned that way. An interesting problem was brought to an American chemist named Augustus Schultz. The white alum-tanned leather used then to cover corset stays persisted in turning brown. Could any way be found to produce a leather that would remain permanently white? Schultz experimented, and in the course of his studies he found that chromium salts produced an entirely new type of leather. The action of these salts on hides and skins had been studied a little in England some years earlier, but Schultz realized that chrome tanning could be made a commercial possibility. At first, however, even the tanners laughed when they saw the leather made by this process. It was stiff, hard and blue in color instead of mellow and russet, as the vegetable-tanned leather was. There were advantages to chrome tanning; the leather was more resistant to wetting, and the time in tanning was much reduced. These advantages stimulated further study in attempting to perfect the process.

A young Philadelphia tanner, Robert Foerderer, interested in the new ideas, patiently undertook a long series of experiments, and his work was rewarded with success. He learned how to treat chrome-tanned leather with soap and oil, a treatment now called "fat-liquoring", in order to give it softness and pliability. With this success a great field was opened to tanners for the production of lightweight and varied colored leather. Robert Foerderer himself became a very successful tanner. His leather took the place of the heavy bark-tanned leather previously used in shoe uppers. Through his enterprise in developing the discoveries of Schultz, chrome tanning was firmly established.

New Machines Aid Leather Production

Between the time of Davy's work and the development of the new chrome tanning, the production of leather — in common with other industries — was virtually revolutionized by the use of machinery. American inventive genius contributed mechanical developments of great importance. Not only did machinery save time and effort by doing away with slow hand labor, but it also opened processes to tanners which had previously been impossible. One of these inventions was so important that it deserves detailed comment.

Since no one can control the thickness of the hides obtained from animals, it was, throughout the ages, difficult to produce thin leather from a thick and heavy cattle hide. This was done only by a wasteful and laborious process. Hides were taken from the vats when about half tanned and carefully rubbed smooth and levelled, and then shaved down to the desired thickness. Obviously the shavings were wasted, and it was expensive in time, for one workman could shave only four hides a day.

Progress Through Performance

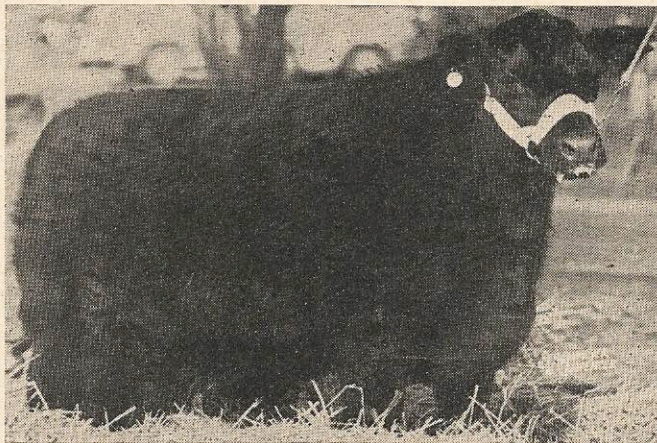
The measure of a breed is its ability to improve the commercial cattle population.

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The following list of spring bull sales in Western Canada affords an opportunity for the purchase of Angus bulls of approved type and breeding — selected from the numerous outstanding herds in the Prairie Provinces:

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Calgary	—	March 19 - 23	Brandon	—	April 2 - 6
Edmonton	—	March 27 - 30	Lacombe	—	May 30 - 31

Catalogues may be obtained from Managers of the above sales.

Sponsored jointly by the **Canadian Aberdeen-Angus Association** and the Manitoba, Saskatchewan and Alberta Provincial Associations.

In 1809 a patent was granted to Samuel Parker of Newburyport, Mass., for a machine that would split leather to any thickness. Hides could be fed into one end of his machine and emerge at the other end accurately cut into two splits, the "grain split" (the outer or hair side of the hide) and the "flesh split" (the inner side). This machine greatly increased the output of usable leather from heavy hides, and it was possible for one workman to split several hundred hides a day.

Other important parts of the tanning process — cleaning, fleshing and dehairing — continued to be done by hand for many years. Experiments with machines to do this work were first conducted with types that moved the skin against a fixed knife. Later attempts were made with

machines that reversed the procedure — holding the skins fixed and moving the knife against them. But neither type was really successful. In 1840, Mellen Bray, a Maine tanner, solved the problem by inventing a machine that combined both of the earlier principles. His machine consisted of a table, on which the skin was held, moving against the knife, while the knife, fixed to a cylinder, moved against the skin.

Another improvement was in the method of using the vegetable-tanning agents. Instead of applying the ground-up oak-bark directly to the hides, it was found better to "leach" the tannin and other extracts from the bark, and to soak the hides in the resulting tanning liquor. It produced better leather, and shortened

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ROMANCE OF LEATHER

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the tanning period considerably.

The vast changes made by machinery is America's great contribution to the leather industry, and it has revolutionized the methods and equipment of tanneries all over the world; since other nations have had to adopt our methods and install our machinery, or be out-distanced by our producers.

Changes in methods of shoe production were also highly important; they lowered the price of shoes, creating a larger demand, and making foot comfort more generally obtainable. Scientifically constructed and sturdy leather shoes were brought within the reach of all through modern methods and the increased output made possible by machinery.

The first shoe-pegging machine was operated by Charles D. Bigelow at his shop in Jacob Street, in "The Swamp" district of New York — that section of the city just south of Brooklyn Bridge. It is still the leather centre of New York. From testimony in a lawsuit against infringers, we know that his machine "would peg around a large size man's brogan in one minute, and the work was done much better than by hand, both as regards uniformity and firmness."

Modern Tanning Industry

As the country expanded, and the use of machinery became general, it was practical to build larger plants capable of greater individual production than to continue to operate the small plants. The rapid development of the railroads and other means of transportation (the earlier canals, and the present-day hard roads) made it no longer necessary to locate the tannery near a forest to obtain the tanning bark. In the early days it had been more economical to carry the lighter hides to the tannery, rather than the heavier bark, but it presently became more practical to transport the bark to more fully equipped tanneries. It was the very lack of transportation that had determined the location of almost all industries, in the early days of our history, and that is the reason so many were started, and long continued to remain, in the seaport or river towns, or at points near some necessary source of raw material. Looking back today, we can easily account for what sometimes seems the peculiar geographical distribution of tanneries. Those making hemlock leather, for example, established themselves along the line of growth of the hemlock tree through Pennsylvania, lower New York, Michigan, and northern Wisconsin. Tanners requiring oak-bark followed a line through the mountains of Pennsylvania, Virginia, West Virginia, North Carolina and Tennessee. Many large tanneries still remain in these geographical areas. Improved transportation made it possible for them to stay, and to bring their raw materials for tanning, and the hides and skins, to their plants; they did not have to move on, following the forest, as they did in olden times.

Pennsylvania remains our largest tanning state, because its forest growth contains both oak and hemlock. Wisconsin, with large resources of hemlock bark, became another centre of tanning. In the Southern states not only the oak abounds, but the chestnut tree as well, and tanning became, naturally, an important activity.

Another interesting impetus to tanning

came at the time when gold was discovered in California. The historic rush of Forty-niners opened territory that in addition to its gold treasure provided a new source of tanning material. This was the California tan-bark oak.

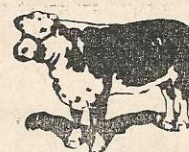
These changes we have outlined may be summarized by giving a few figures that show how dramatic the difference is between the old handicraft industry and the modern way of manufacturing. In 1849 there were 6,686 tanneries in this country. During the eighty-odd years between then and now, the number of tanneries declined (after a slight increase) until in 1935 there were but 383 in operation. In 1849, the 6,686 plants employed only 25,000 people, while today only 383 tanneries employ more than twice that number, or 53,000. Wages paid to employees amounted to approximately 6½ million dollars in 1849; the present annual payroll is more than 58 million dollars. In 1849, the tanneries produced leather worth about 43 millions; today's output would exceed 300 million dollars in value.

The tanning industry today is a very important part of our industrial and economic life. The comfort and health of nearly everybody depends upon a uniform and constant production of carefully-manufactured leather. About 400 million pairs of shoes are produced in the United States every year, and for the soles and uppers, and the inner parts of the shoes as well, enormous quantities of leather are necessary. In addition there are numerous other leather articles upon which we depend for comfort and convenience — gloves, sports jackets, belts, purses, billfolds, handbags, luggage — to name but just a few. Farmers require leather for harness; leather belts are necessary to transmit power to machinery, and there are other strictly industrial uses. To supply leather for these and many other purposes, the tanneries of the nation must operate day after day.

Perhaps the most remarkable fact about the leather industry in its relation to the economic life of the country is its great stability. Year in and year out, through depression and prosperity, tanneries keep running. Their workers are always employed because leather is always needed. Nothing demonstrates more clearly how much a basic necessity shoes and leather are than this admirable soundness and stability of the industry that makes them.

There's Romance in Leather

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