

Let us each, in our own mind, follow a steer through a modern plant. Usually the animal is first felled with a blow from a small sledge; it is then shackled by the hind legs and swung into a perpendicular position for sticking. The blood is often caught in buckets and sent to the sausage kitchens for use in blood sausage. For inedible purposes the blood from thousands of steers each day is collected in a large vat, where it is allowed to coagulate and is then cooked with live steam. Subsequently the water is pressed out and the residue is ground into a fine meal suitable for chickens, pigs, or calves. It will carry about 80 per cent. of crude protein and is thus valuable as a fertilizer. The average cattle beast will yield about 32½ pounds of raw blood, which is converted into approximately 7½ pounds of dried material. Incidentally the average hog yields about 7 pounds of raw blood, and the average sheep about 2.4 pounds.

A feature of Armour & Company's plant at Chicago is a moving platform 250 feet long and 10 feet wide. This will accommodate 35 carcasses and 60 workmen at one time. Here the carcass is skinned and the feet, up to the knees, cut off and thrown into chutes which carry them to a lower floor, where hoofs and horns are softened by steam, split open and then pressed into flat plates. From these plates stamping machines cut out combs, buttons, hair pins, umbrella handles, napkin rings, tobacco boxes, buckles, and what not. The residue is ground and used as a fertilizer. Since the exodus of the long-horned Texas steer, and the advent of the polled or dehorned bullock, horn products have diminished in quantity and variety. More young steers are now coming also, which tends to diminish the amount of horn to be converted into useful articles. The shin bone is sawed into flat slabs and then shaped by various instruments into handles for knives and razors, carved and dyed to resemble stag horn, pipe stems, dice, chess men, electrical bushings, crochet needles, flat buttons, washers, artificial teeth, and bone rings for nursing bottles. The head is split open and the brain removed. This is sent to the chilling room, later to be distributed to all parts of the country.

The hide and hair are yet to be disposed of. Almost everyone knows the common destination of the hide, yet few realize the many kinds of leather that are made from it. The hair which the tanner removes is used as a binder in house plaster, or for stuffing horse collars. The long switch at the end of the tail goes into upholstering work and the hair from the inside of the ear is plucked and tied in bunches for the manufacturers of art supplies, who convert them into brushes for oil and water-color painting.

From the clean pink pates of calves, a delicate grade of gelatine is prepared, which goes not only into fancy dishes but is used as a stiffener in ice cream, or by the brewers in clarifying beer.

#### What the Packer finds on the Inside.

After the hide and extremities of the steer are removed, and often while that work is in progress, the carcass is slit open and the viscera taken out. The internal organs are first inspected by Government inspectors, after which the different parts go scampering hither and thither throughout the building on moving tables or rollers to the various departments, each of which specializes in the care of a certain portion of the animal.

Where a considerable sausage business is done, beef extract is first made from the hearts after which the meat is converted into sausage. Beef hearts will yield about 2.41 per cent. of extract—ordinarily the hearts and livers go to the chilling rooms there to receive further handling and freezing. Later these are distributed to the consuming public who appreciate them as articles of diet.

The bladders as well as the large and small intestines go to the sausage-casings department for cleaning. Some are inflated and dried to the thinness of paper and used as containers for bologna sausage or putty. The tubular linings of the gullets are also stripped out and made into bologna casings. Certain grades of intestines, the fine kinds, are prepared as caps for perfume bottles or to be used by gold beaters as a covering for the metal when it is being pounded to an extreme thinness.

Some gall stones from the slaughtered cattle beasts are shipped to Japan where they are used as a talisman or charm, just as a superstitious person in this country might carry a rabbit's foot about with him. Apart from this singular trade, the galls, gall stones, and certain small glands go direct to the laboratory to be manufactured into drugs. The arts and sciences make use of those parts to a considerable extent. The principal use of ox-galls is in the mixing of water-color paints and inks. They are also used as a substitute for India ink and as an ingredient of varnish. Ox-galls possess a soapy quality which makes them valuable as a cleansing agent for scouring wool and woolen textiles. The many small bones, from which the flesh is removed in the various processes of the packing plant, are made useful in divers ways. Some are made into what is called case-hardening bone, used by manufacturers in hardening ball bearings, bicycle and automobile cones, and for bluing the steel barrels of revolvers and rifles.

Little need be written with regard to the rennet extracted from the stomachs of calves. The shortage last season emphasized its great importance in the manufacture of cheese.

#### Oleomargarine and Candy filler from Cattle.

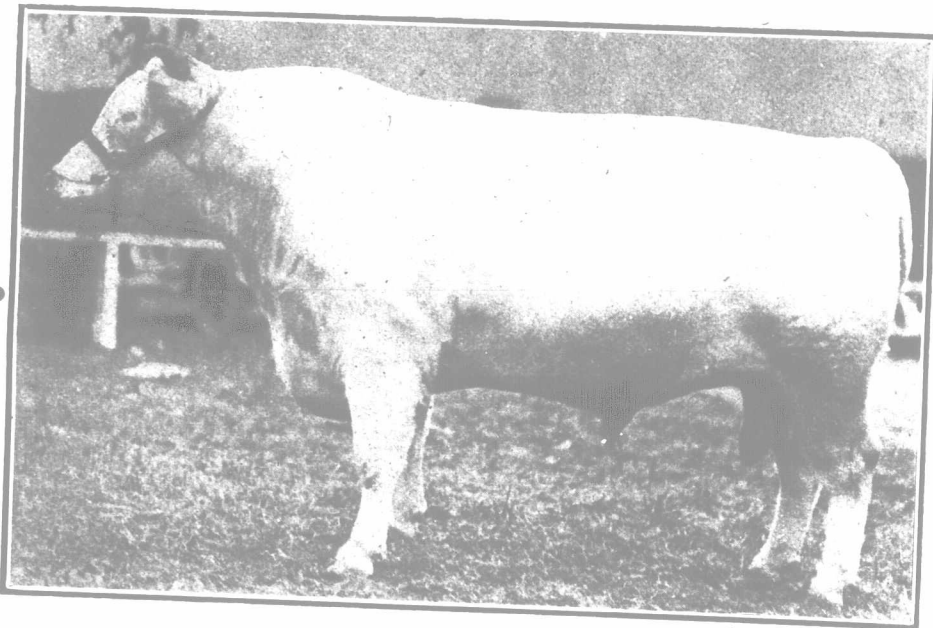
To see the oleomargarine flowing through the chutes in the plant of Libby & Company in Chicago, and to follow it through the various processes of printing and

wrapping is enough to astonish the lay mind or lead one to doubt the adequacy of the demand to consume it all. However there are many other institutions of the same kind producing this butter substitute, the basis of which is oleo oil and neutral lard. This oil is made from the caul or kidney-fat of the steer by a warming and pressing operation which forces out the thin yellow oil, sometimes called butter oil. Several grades of oleo oil are produced from fats taken from various parts of the animal and from portions used for different purposes. The hard mass remaining after the oil is removed goes under the name of stearin. Oleo stearin is used as a filler in the cheaper grades of chocolates, taffies, penny candies and chewing gum.

The best grades of oleomargarine contain, along with oleo oil, some neutral lard which is obtained by rendering the best grades of leaf lard in a cool temperature. The product obtained is neutral as to taste, color and smell. The product remaining after the neutral lard is removed goes as lard-stearin.

#### Dynamite for the War Lords.

Soap making was formerly an important branch of the packing industry and as a by-product of this process glycerine was produced. The demand of the war lords for explosive material has almost made soap a by-product of glycerine manufacture for the latter is used in the preparation of nitro-glycerine which is the basis of dynamite and other high explosives. One plant in Chicago turns out sixty grades and varieties of soaps, toilet, laundry and industrial. In addition to these are made: cleansers, washing powders, talcum powder, tooth paste, face cream and smelling salts. High-grade tallow, to-day, is the basis of soap making. Glycerine, the by-product, in addition to its use in the manufacture of explosives, is taken largely by the medical profession, where it serves as a vehicle for certain medicines to be applied externally. It is also used in the manufacture of parchment paper and printers' rollers.



Sea Gem's Pride.

First in his class at Toronto and grand champion Shorthorn bull at London, 1916. Exhibited by Kyle Bros., Drumbo, Ont.

#### Glue and Fertilizer.

It has been said that "glue holds the world together, so generally is it used in the processes of manufacturing. Packers distinguish between "bone glue" and "hide glue". The raw materials for bone glue comprise the feet of cattle, sheep and hogs; their skulls, jaw and rib bones and shoulder blades. Large quantities of glue are required in the manufacture of paper, books, leather goods, oil cloth, musical instruments, trunks, billiard tables, corks, matches, carpets, cameras, pencils, toys, coffins, silks, whips, window shades and sandpaper. After all this processing, which has been enumerated in the previous paragraphs, is complete, the residue is converted into fertilizer for use again on the farm.

In this journey of the steer through the modern abattoir we have enumerated the more important by-products only and we have not taken into consideration the many grades of the same. In the Armour plant alone, fifty or sixty varieties of canned meats are regularly produced from utilization of tongues, kidneys and the various cuts of lean meats. There are more than twenty classes and grades of oils and greases derived from packing-house operations; thirteen varieties of casings for sausage, putty and other containers; thirty-eight varieties of dry or summer sausage; forty-seven varieties of fresh breakfast sausage; six grades of oleomargarine; five grades of oleo oil and ten grades of beef extract. For the medical profession only, forty-eight preparations are made, glands and membranes being utilized while fresh, in the plant laboratories. Among the important medical agents produced are pepsin, pancreatin, thyroids, rennet, benzoated lard, suprarenals and pituitary liquid. These are made from glands and membranes of hog, cow and sheep; among them are some of the most important therapeutic agents.

#### The Adventure of the Hog.

At one entrance to the Swift & Company's plant in Chicago, one can see hundreds of hogs per hour go shackled up the revolving wheel and on to a track

which carries them into a dark beyond. On their way they carry the brief part of a second to pay their respects to a man, with knife in hand, and then they start on their long and devious way again, oblivious to the treatment they receive. Space will not permit of a detailed description of the scalding and dressing processes, or of the utilization of all materials, but suffice it to say that nothing is wasted and in the preparation of a swine carcass all machinery is tuned to the work, and the division of manual labor is most complete. The same may also be said of the slaughter of sheep. A few by-products the source of which people generally do not know are mentioned in the following paragraph:

Pepsin is from the lining of the pig's stomach; it is used as an aid to digestion, and in stomach troubles generally. The most popular forms of pepsin are pure pepsin, essence and tablets. Pancreatin comes from the hog's belly sweetbread. It is employed as a medicine, and to peptonize food for infants and invalids. Thyroid glands of sheep are made into powder and tablets. Thyroids is a specific medicine, and is used in diseases that are due to a deficiency of thyroid secretion. A great many cases of idiocy in children can be cured by thyroids. Suprarenal preparations, made from the glands that are located just above the kidneys, are used internally, and from the substance is got a powerful astringent and heart stimulant called suprarenalin, which is worth more than \$5,000 per pound. Pituitary products, from a gland located at the base of the brain, are of great service to the medical profession. The finest of the pituitary preparations is pituitary liquid, a solution of the active principle.

#### The Economics of Slaughtering.

If anything further is needed to impress upon readers the great economy practiced in the modern packing plant it might be interjected here that in every steer slaughtered is a small gland the size of a pea, called the pineal gland. This is used in the

manufacture of a drug, pineal substance, and 15,000 steers must be handled to get sufficient of these glands to make one pound of the medicine. It is only through the use of adequate refrigeration that this saving can be accomplished and the multitudinous by-products of the plant which were formerly "packers' waste" owe their numbers and their excellence to applied science. It has all been fought out in the laboratory.

The trade in meat animals is one of the biggest things in the country to-day. The daily turnover at the Union Stock Yards Chicago, amounts to approximately one and one quarter million dollars, and it has been estimated that no less than 400,000 people are dependent either directly or indirectly on the operations of the Stock Yards and packing town for a living.

The packers' by-products represent a great amount of wealth in themselves, but many of them constitute the raw material for still other industries. It is impossible to tell where the parts of a finished bullock will stop when the animal once leaves the farm. There is apparently no indestructibility of the steer or his parts.

The statements made in this article are based largely upon conditions in the United States, and the abattoirs there, yet Canada has the resources and the possibilities, which if developed will insure a live-stock and packing business equal to anything we have mentioned in these columns.

#### The Tuberculin Test.

EDITOR "THE FARMER'S ADVOCATE":

In a recent issue of "The Farmer's Advocate" my attention was drawn to an article written on the tuberculin test in which the writer set forth the argument that the tuberculin test was not as valuable as had been formerly supposed. Personally, I do not agree with his article. Firstly he maintains that by a series of examinations, covering probably a year, a veterinarian may diagnose the disease and not run the risk, (if such there be) of the tuberculin causing a quick breaking down of the system by the disease. Now I have for some time been holding post-mortems in some of our largest abattoirs, being on the civil service, and I have not infrequently found healthy appearing animals in prime condition, which on post-mortem showed advanced stages of the disease, and very often lymph glands, (these are glands situated between the lungs) with absolutely no lesions at all in the lung tissue. Now these cases couldn't possibly be detected by making an ante-mortem examination, neither would you be able to find it in the sputum for they were purely localized cases and are not condemned for food. Now the reader may ask if it is localized and no infection in the excretions where is the danger with this animal.