

individual valuation placed was \$189.54, and the highest average was \$75.42.

The translation of pounds, shillings and pence into our currency accounts for cents being mentioned in the range of averages.

How Wool Grows.

Since the time when the microscope was invented, many things have been made visible which had hitherto remained hidden from man's gaze. There is no substance of which this can be said more truly than of wool. It is true that the microscope was not needed to tell the quality of wool; that could be seen by the eye of a practical man. Before the microscope was used it was thought that wool fibres had about them some peculiar feature which helped them to hold together. This assumption has, by placing wool under the microscope, been shown to be an actual fact. By microscopic examination the wool fibres may be so enlarged as to show quite clearly that they are serrated. Every mark on the surface and every feature of a cross-section can be clearly seen.

In order to explain the nature of the wool fibre and the manner of its growth it is necessary to study the skin. The skin of the sheep, like that of human beings, is made up of four layers. These are composed of a vast number of cells, which are not visible to the naked eye, and are pierced by three glands. The first of these glands is the sweat gland which carries off the waste matter of the body. The second is the sebaceous gland, which does not go through the skin, but terminates in the hair gland. Through this gland flows the suint or wool yolk, the purpose of which is to help the wool fibre to force its way through the skin. The third gland is called the hair follicle and deserves to be specially noted. The most natural idea which, owing to the remarkably small dimensions of the glands we are considering, may develop in our minds, is that the hair or wool is something which is being prepared under the skin, and that after preparation it has only to force its way to the surface. This notion is altogether erroneous. The hair follicle is really a depression in the skin, as shown in Fig. 1.

It is well known that the human skin is constantly shedding off old dead tissue in the form of cells, and replacing them by new ones. An exactly similar process is always going on on the sheep, but owing to the great number of hair follicles the skin also produces a complete covering of fibres.

The Hair Follicle.

The shape of the hair follicle should be specially noted, for it is upon this that the development of the fibre depends. Down in this minute recess there is none of that friction which carries away all the dead cells which are thrown off on the surface. Moreover, the warmth of the follicle prevents them from losing their vitality as soon as they become detached, yet the throwing off process is in constant operation, so that the follicle is kept constantly packed with detached cells which are slowly working their way towards the opening at the top. The reader will see that the follicle is much narrower at the opening than at the bottom. The result of this is that, as the cells which have become detached are being forced upwards by those which are succeeding them they become more closely pressed together, and finally emerge through the mouth of the follicle in the form of a wool fibre.

Serrations of the Fibre.

One of the most interesting features of the wool fibre is its serrations. Even quite recently their presence has been denied by some who claim to be authorities on wool. This is very surprising, because the microscope reveals to us, with a clearness which admits of no denial, that these serrations actually exist. These serrations are formed in the following remarkable way. We have seen that the fibre consists of cells which have become detached from the skin, and which have been forced to the surface. The pressure of the atmosphere upon the cells which have just made their way to the outside, causes them to shrink. The cells which follow form a kind of bed for those that have gone before, and in that way protect their lower surface. This process continues contemporaneously with the throwing off of cells within the follicle, and the result of this twofold operation is the production of the fleece. It may be pointed out that there is one point or serration for every cell which lies on the surface of the fibre.

The wool fibres, as has already been shown, are made up of closely condensed cells. The action of the atmosphere upon them does not destroy their individuality, or make it impossible to distinguish between two distinct cells. Though shrunken, every cell remains, and if placed under suitable conditions may go back to their original nature. The substance of the cells is horn-like, and because of this can be dissolved. These two points should be carefully noted, because they have a most important connection with the washing of the wool after it has been shorn, and also upon its felting properties.

In a single transverse section of hair no less than 1,500 cells may be seen. Also, when looking at the fibre in this way, three distinct parts are visible, as shown in Fig. 2.

It will be seen that the two outer layers of cells have lost their circular shape. Owing to the pressure which has been brought to bear upon them, the cells in the outermost layer have become elongated, and the second layer contains angular-shaped cells. The flat shape of the outer cells is the cause of the prominent undulating lines which appear on the outer surface of the fibre. The central cells which form the medulla

of hair are not so heavily pressed as the other cells, and therefore retain their circular shape. By counting a small portion of a cross-section of hair, the number of cells contained therein has been found to be 1,500. If we assume that the average length of each cell is one four-hundredth part of an inch, we find that there are no less than 600,000 cells in one inch of fibre.

Hair Versus Wool.

In passing, we may make a few remarks upon the distinction between wool and hair. True wool contains no medulla, and if we were to take a number of fibres, cut them transversely, and place them under the microscope, we should be able to distinguish the wool from the fibre by this means alone. The proper way, however, to distinguish between the two kinds of fibre is to note the difference between their outward appearance.

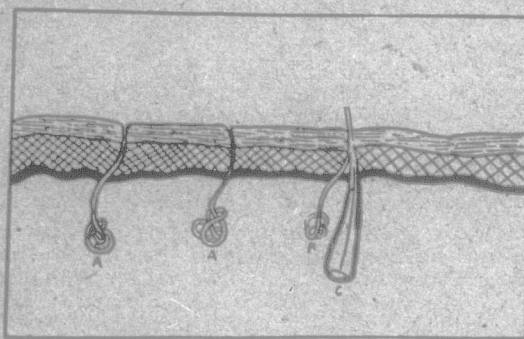


Fig. 1—A, sweat gland; B, sebaceous gland; C, hair follicle.

The outer layer of cells on a hair fibre lie flat upon the inner cells, and thus give to it a smooth appearance; but the scales on the wool fibre stand out prominently, thus making the surface appear like the edge of a saw. Fig. 3 shows the difference between wool fibre and hair fibre.

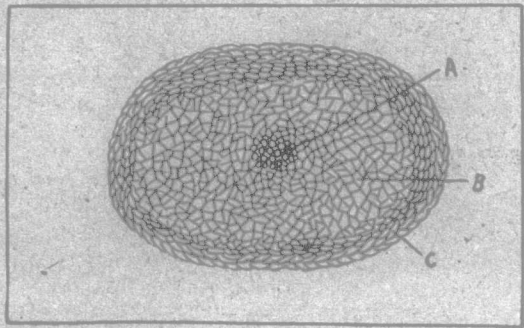


Fig. 2—A, medulla; B, cortex; C, cuticle.

Points for Growers.

Perhaps some reader will ask, "What is the bearing of all this upon the practical side of wool production?" Growers generally are not interested in technical terms and scientific explanations; indeed they often show a strong dislike for them. Yet the ordinary details

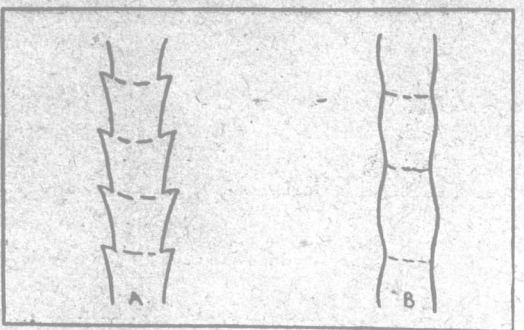


Fig. 3—A, wool fibre; B, hair fibre.

of the sheepmaster's life are most closely connected with the technicalities of the wool trade. This is a fact which ought never to be overlooked, and if wool-growers generally could be brought to realize the importance of it, a long stride would be taken towards bringing about a better understanding and a more amicable feeling between the man who grows the wool and those who convert it into the finished article. We know that the understanding of which we speak has not yet been arrived at. The wool-grower is too prone to think that his interest and the interest of the man who buys his wool are entirely at variance. The result often is that too little care is taken with the wool even at shearing time. The interest then shown reveals itself chiefly in a desire to secure the highest possible price, and to get the wool into the market as quickly as possible if that price appears satisfactory. If the price does not please the would-be seller, the wool is sometimes foolishly held over, stored in a room, and kept until prices sink lower still. That was the rule in some pre-war years.

Surely this is a great mistake. The object of this article is to impress upon wool-growers the importance of their wool, and to take a deeper interest in the same. By so doing they will not only confer a great boon upon manufacturers, but their own interests will be advanced. By studying the way in which wool grows, by observing the wonderful organism which has been created to promote its growth, and by remembering the great variety of purposes for which the shorn fleeces are used it will be seen that the subject of wool-growing is well worth considering.

To wool-growers we say, study your sheep and study

their fleeces. Remember that soil, food, and climate are all important factors which either help or hinder the production of good wool.—S. B. HOLLINGS, in the Live Stock Journal Almanac.

Canadian Store Cattle Considered in England.

Recently an announcement was made in Britain in regard to a conference Mr. Prothero, the British Minister of Agriculture, had with Canadian representatives last April. At that time the argument of the Canadian stockmen was presented and the Imperial Government was asked to permit our live cattle, as well as dead, to be imported. An Act in 1896, aimed to protect British stocks from disease, prohibited the importation of live cattle, except for slaughter at the port of landing, and this stigma has been over Canadian cattle ever since in spite of the fact that no country in the world enjoys any greater freedom from contagious diseases among its herds. A well organized appeal was made last winter and carried overseas. In reply Mr. Prothero said: "The home demand for store cattle in the Eastern Counties has been rather imperfectly met for many years past. On the other hand, there has been a considerable increase in breeding in this country; but if we have, what I think we shall have, a large extension of the arable farming in this country, we shall want to increase our reservoir of store cattle. Of course, your Canadian cattle will come over as what we call 'stores'; that is to say, they are to be fed and fattened here in England." A motion was also accepted by Mr. Prothero to the effect that the embargo on Canadian cattle should be removed as speedily as possible.

It has long been known that Ireland, which supplies England with a large number of unfinished cattle, was a strong supporter of the Act, but apparently the Scottish farmers have not looked unfavorably upon it. Editorially, "The Scottish Farmer," published in Glasgow, says: "This is undoubtedly a back-door victory for the wharftowners, and those farmers who have been clamoring for the importation of Canadian stores all these years. We are hardly inclined to believe that the Canadians would make it a condition of their adherence to the cause of the Mother Country that we should receive her store cattle 'as speedily as possible.' Why then has the Minister of Agriculture made such a complete departure from the policy of his predecessors without consulting the breeders of pedigree stock in Britain? Contagious disease may not have been known in the Dominion in recent years, but there has been a good deal of it on the American continent and this is not a time to take any risks in the matter. Scotland has been entirely free from disease for many years, and as we have the finest cattle in the world it is only reasonable that we should desire to protect them from the ravages of such a scourge. It will be the duty of breeders here to acquaint Mr. Prothero of their views before he can make complete the fulfilment of his capitulation to the advocates of the importation of Canadian store cattle. An opportunity for taking such action as is necessary will be afforded during the 'Shorthorn week' in Scotland next month."

Shipping unfinished cattle overseas does not appeal to all as an act of wisdom on the part of the Canadian farmer. However, they appreciate having the stigma removed which has for long years been hanging over our herds and flocks, and it opens one more door to any surpluses we may have in that line.

Fall Sales of Live Stock Begin in U. S. A.

The opening fall sales of live stock in the United States indicate a keen demand for pedigreed cattle and a continuation of the confidence that live stock breeders have exhibited during the last two years. So long as the dressed carcass commands the price it does there is not likely to be any decrease of enthusiasm or in prices in the pure-bred department of the industry.

At the Good-Wilson sale held at Grandview, Mo., on October 1, 77 head of Herefords realized the splendid average of \$638. The females were mostly in pasture condition, but 56 averaged \$648. One cow, Crocus 5th, went for \$2,500, and another, Celeste, brought \$2,025. The 21 bulls averaged \$610. The highest price for a male was \$2,100, paid for Blendwell, a son of Beau Delaware.

Fifty-six Herefords averaged \$910 at a sale held in connection with the American Royal Live Stock Show at Kansas City, on October 5. Thirty-four bulls made the average of \$906, and 22 females fetched the equivalent of \$918 each. The top was \$3,000 paid for Gay Lad Jr., which won in the senior-yearling class of the Show.

J. O. Southard, Comiskey, Kans., sold 116 Herefords on October 6, for \$69,790, or an average of \$601.63. Ninety-two females were appraised at \$612, and 24 bulls at \$560. Belle Fairfax and bull calf topped the sale at \$2,725. Eleven of the best bulls, considered high-class herd-headers, averaged \$1,050.

On October 2, the Shorthorn herd belonging to the estate of the late Philip Erbes, La Moille, Ill., was dispersed and the 38 head offered averaged \$302.

The second sale of the Ft. Wayne District Shorthorn Breeders' Association held at Hometown, Ind., on October 3, resulted in an average of \$227 for 76 head.

An average of \$286 was realized on 40 Shorthorns sold at public auction by W. C. McGavock at Mt. Pulaski, Ill., on October 3. Many of the offering were not in high flesh and sold at moderate prices.