



"Bingo! . . . The Fiery Little Columbia is Always There With the Ignition Punch!"

QUARRY BLAST CHARGE and auto engine gas are alike in the Fiery Little Columbia. The power's in the fuel; but it takes the Columbia hot spark to set it to work.

That's a regular Columbia job—releasing energy by ignition.

THE DRY BATTERY

WHAT a marvelous little bundle of big ability the Columbia Dry Battery is! And what a multitude of uses! It makes bells jingle and buzzers buzz; whirls the youngsters' toys into a riot of fun; gives snap to telephone talk; puts a swift kick into the ignition of autos, trucks, tractors, farm engines, and motorboats.

THE STORAGE BATTERY

IN the storage battery field the name Columbia means definite power and long life—the inevitable product of an institution long famous in battery history.

There's a Columbia Service Station or a Columbia Dealer near you.

Step in and let them tell you how the Columbia Storage Batteries are distributed, and how the Columbia Service Plan insures that the motorist shall have the full service to which his original purchase entitles him.

Columbia
Storage
and Dry Batteries

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Our School Department.

The Story of Wool.

BY PROFESSOR G. E. DAY.

The next time you visit a fall fair, be sure you do not come away without going to see the sheep. If you are fortunate enough to visit one of our large fairs, such as Toronto, London, or Ottawa, you will find the sheep pens a very interesting place. Here you will see many different kinds of sheep; some large, some medium size, and some small; some with white faces, some with brown or grey faces, and some with black faces; some with their faces so covered with wool that they can scarcely see out through it, and some with no wool at all on their faces; some with horns, and many with no horns—in fact, the longer you look at these beautiful creatures the more you will find to interest you. There is one thing about sheep that makes them look very different from all other farm animals, and that is the warm coat which they wear. This coat is so thick and so warm that the sheep can stay outside in the coldest weather without minding the cold in the least, while a horse, or a cow, or a pig, will shiver and look very uncomfortable indeed. Now, the horse, cow and pig have coats, too; but their coats are made of hair, while the sheep's coat is made of wool, and wool makes a much warmer coat than hair.

Did you ever think of what is the difference between wool and hair? If you part a sheep's wool with your hands you will find that it is made up of a great number of very fine wool hairs, or fibres, which grow out from the skin of the sheep so close together, and so long, that they form a coat which the wind cannot blow through. After handling the wool you will find that your hands are quite greasy. This grease, or oil, comes from the skin of the sheep, and is called "yolk." It keeps the wool fibres soft and smooth, and keeps them from tangling or matting together. It also helps to keep out water, so that a sheep can stay out in quite a heavy shower of rain without getting its coat wet through. Then, again, if you look at these wool fibres closely, you will see that they are not perfectly straight, but that they have a wavy appearance. In some kinds of wool these waves, or bends, in the fibre are much closer together than in other kinds. The finer the fibre is the more waves it has, while wool with coarse fibre has very few waves. These waves, or bends, are called the "crimp" of the wool. When the waves are very close together, the crimp is said to be fine, so that fine wool has fine crimp and coarse wool has coarse crimp.

But there is another difference between wool and hair. If you take a single fibre of wool, and take hold of the end that grew next to the body of the sheep, and then draw the fibre between the finger and thumb of the other hand, you will find that it slips through very smoothly. But if you take hold of the other end of the fibre, and then draw it between the finger and thumb as before, you will find that it seems to catch, and does not slip between the fingers nearly so easily. Why is this? It is because every wool fibre has hundreds of very, very small scales on it, something like the scales on a fish, only so small that they cannot be seen without looking at the wool with a microscope, which makes the wool fibre appear many times larger than it really is. These tiny scales all point towards the outer end of the wool fibre, so that when you took hold of the outer end of the fibre and tried to draw it between the fingers of the other hand, the points of these little scales caught on your fingers and made it hard to pull. Hair also has scales upon it, but the points of the scales on the hair are rounded, and they lie so close to the hair that they do not catch hold of anything they rub against; while the scales on the wool fibre have sharp points and rough edges, so that they catch and cling to everything they touch. This difference in the kind of scales is the most important difference between wool and hair.

Now, when the weather grows warm in the spring, the sheep does not need its

warm coat, and so the farmer clips it all off, or shears the sheep, as we say. The wool is then sold, and is sent to the large factories, where it is made into all sorts of clothing, blankets, yarn and other goods.

Before it is made into cloth the wool is twisted, or spun into yarn. If the wool fibres had no crimp, they would not stay tightly twisted together, and the yarn would be of very poor quality. Then the yarn is woven into cloth by machines, and the way the wool is handled in spinning and weaving causes the little scales, which we have described, to catch into one another and the wool fibres become all tightly matted, or felted together, making a firm, strong piece of cloth. From what has been said you will see the use of the crimp and the scales of the wool. The crimp makes it possible to twist the wool into yarn which will not easily untwist again, and the scales cause the wool fibres to stick together, or felt.

It would take too long to describe all the different things that can be made out of wool; so we shall mention only a few of the principal classes of goods. Wool that is very long, strong and coarse in fibre is often called "braid" wool, because it is from such wool as this that braid is made. Then there is other wool, not quite so coarse as the braid wool, but still quite long and very strong in fibre; this is made into what are called "worsted" goods. Worsteds are used very commonly in making men's clothing. Some sheep produce wool that is quite long and yet very fine in fibre. Wool that is between two and three inches long, and very fine in fibre, usually sells for a higher price per pound than other kinds. It is used very largely for making ladies' dress goods, such as delaines, and is often called "delaine" wool. Wool that is short and fine in fibre is used for making such goods as broadcloth, fine underclothing, tweeds and other goods of that kind. Some wool that is long and coarse has weak spots in its fibres; and any wool that has weak fibres cannot be used for delaines, worsteds, or braid, but is made into cheap tweeds, blankets, coarse underclothing, carpets, coarse stocking yarn, and such like. Thus, you see, there are many kinds of tweed, underclothing, blankets, and such goods, depending upon the quality of the wool that is used in making them.

Such goods as delaines and worsteds have a smooth surface. This is because the wool is put through machinery which stretches the wool fibres out straight, and they are then twisted together in such a way that all their ends are tucked in out of sight. This stretching is called "combing," and the wool fibres must be sound and strong in order that they may not break during the operation. But if you examine a piece of tweed or blanket, you will see the ends of the wool fibres standing out from the surface, making the material look rough. This is because the wool has not been combed, but has been put through a process called "carding," in which the wool is rolled up in such a way that when it is spun the ends of the wool fibres stand out from the yarn and give a rough appearance to the cloth after it is woven. As a rule, wool that is less than two inches long is not combed, but is used for carding; and wool that is weak in fibre will not stand combing, and therefore must also be carded. There are many other interesting things which might be said about wool, but I simply ask that whenever you see a sheep, you will think of what you have learned about the wonderful coat it wears, and remember that we should always be kind to these gentle and timid animals, because we owe them much of the most beautiful and most comfortable clothing which we wear.

"All work and no play makes Jack a dull boy." Give the boys and girls a few days' enjoyment without any work whatever to do. Better still, let them visit an aunt, uncle or cousins in the neighboring town or city for ten days or so. They will come back to the farm with renewed vigor and with a new interest in their daily tasks.