PHOTOS OF COTTON fibers, enlarged ← 700 times. Note the point of fiber attachment, point of breakage during ginning.

Taking a Close-up Look at a COTTON FIBER

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We usually think of cotton fibers by the bale, or at least by the boll. But sometimes it is worthwhile to think about a cotton fiber by itself.

We are accustomed to seeing cotton fibers swallowed up wholesale by a mechanical picker, or spewed out by the billions at a cotton gin, or shipped in 500 pound lots to the mill. One 500 pound bale contains about 60 billion fibers. Why worry about just one of them?

The reason is that detailed studies of single fibers provide knowledge of such questions as:

How cotton fibers grow out of the seed;

How they develop the important properties that make them so useful;

How they are attached to and removed from the seed.

This last question has been studied by means of photomicrographs. At about the time of flowering, certain cells elongate from among the epidermal cells on the surface of the ovule, which will become the seed. The elongating cells (fibers) continue to grow for about three weeks and ultimately reach a length of about 1500 times their diameter.

As cells go, cotton fibers are gigantic. At maturity, when the boll opens and the fiber fluffs out, the base of the cotton fiber remains in its original position among the epidermal cells that did not grow out to become fibers. This forms the fiber attachment, which is shown in the photos above. The photographs are magnified 700 times.

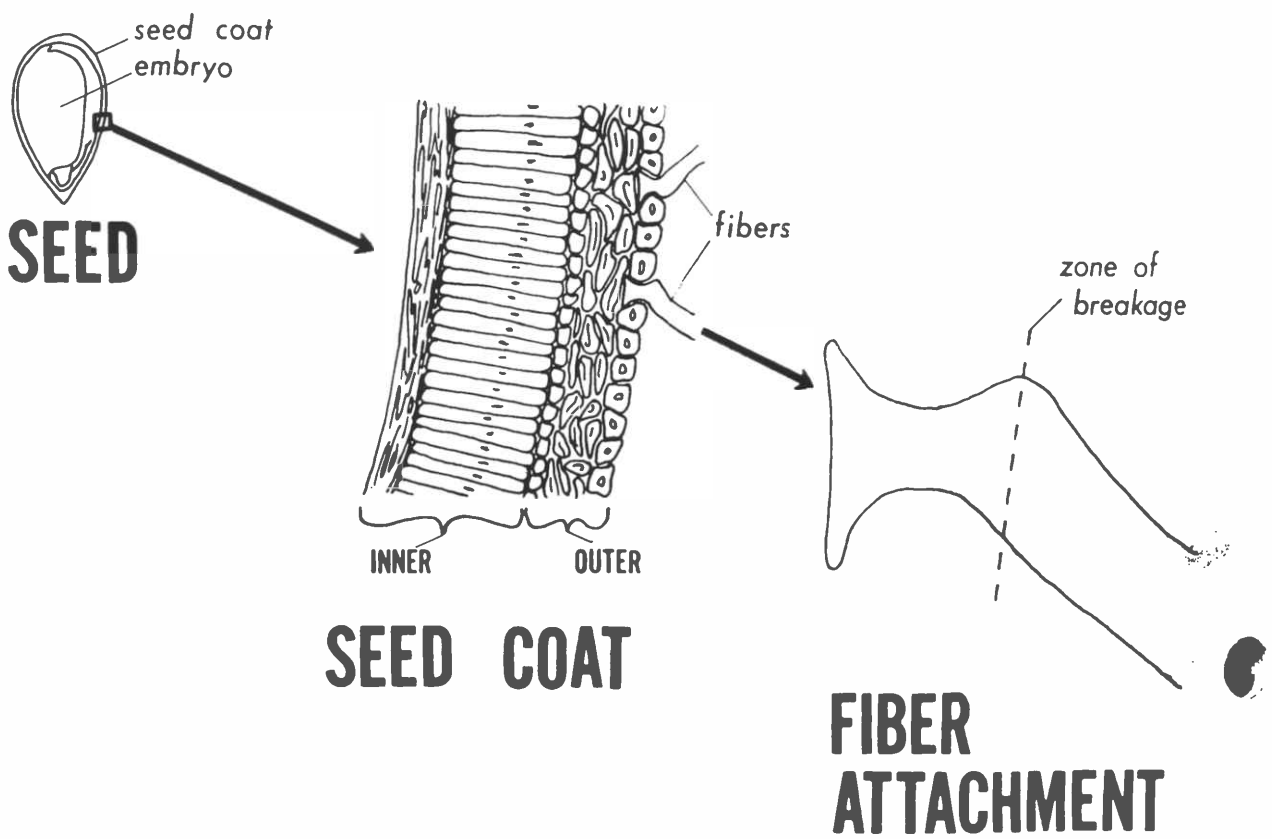
When the cotton fiber is removed from the seed, as in the ginning process, this attachment must be broken. The fiber cell has its weakest point right at the seed surface, and it is at this point that the fiber is broken and separated from the seed.

An Important Weakness

If this weakness were not there, satisfactory ginning would not be possible, since the fibers might break at any point along their length. The portion of fiber removed in ginning would vary in length according to where the fiber broke, and sizable stumps of fiber would adhere to the seed after ginning.

Fortunately, this is not the case and cotton *can* be ginned satisfactorily. These microscopic studies of single fibers will hopefully lead to the development of cottons with improved ginning properties, by providing detailed knowledge of how the cotton fiber is attached to the seed.

BELOW, note drawing of seed, of seed coat, and attachment of fiber in the outer seed coat. Note point of breakage at shank of cotton fiber. Wild cottons do not have this defined "elbow" and the fibers may break at any point.



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