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ROTOR SPINNING OF AMERICAN COTTONS (Part III) The past two issues of *Textile Topics* have given the first half of a report on research that evaluated the rotor spinning performance of cottons from four major production areas in the United States. As we have previously stated, the complete report is too extensive to carry in a single issue of *Topics*. Therefore, we have serialized this in four parts. The portion carried here will complete three-fourths of the report, and the final part will be given next month. We encourage our readers to put the four installments in proper sequence, in order to have complete details of the study. If anyone fails to receive any part, we ask that you write for the missing portion.

The title of the report is "The Suitability of Certain American Cottons for the Production of Fine Count Rotor-Spun Yarns." It was sponsored by W. Schlafhorst Company, Monchengladbach, West Germany and American Schlafhorst Company, Charlotte, North Carolina.

The following is a continuation that begins immediately after the end of last month's segment. We hope that dividing the report will not detract from its significance. We suggest that a review of the previous installments be made before studying the following information.

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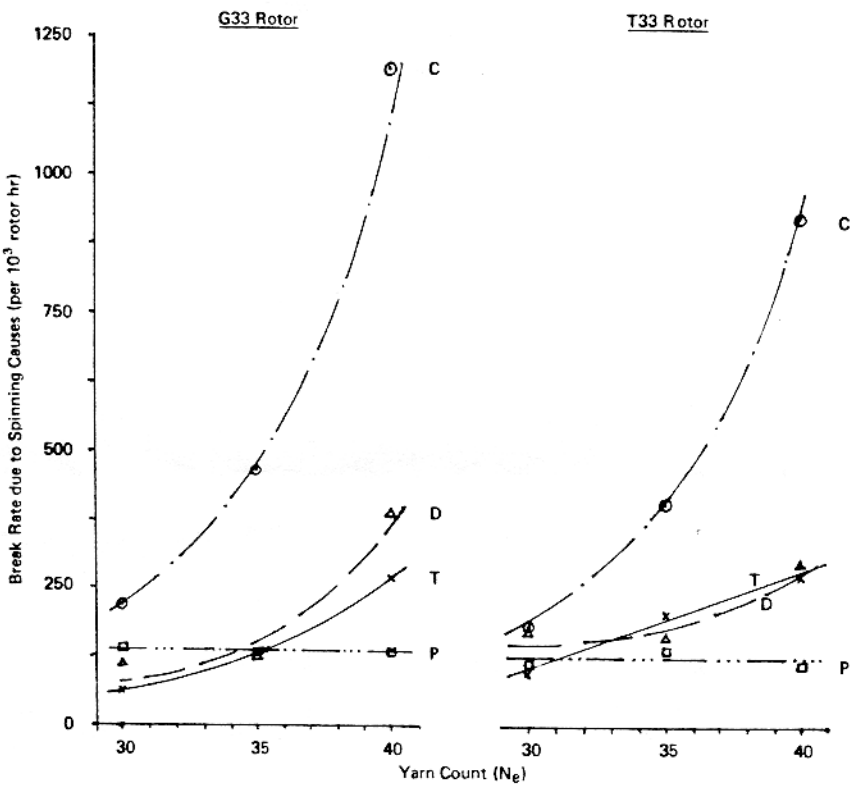
6. SPINNING PERFORMANCE

Figure 14 clearly illustrates the spinning performance experienced with the various cottons. As the yarn count becomes finer, the breakage rate from spinning-related causes increases rapidly for all cottons except Pima. The Pima cotton's breakage rate was virtually independent of yarn count. The breakage rates incurred when spinning from Delta and Texas cottons were similar, but the break rate experienced with California cotton was significantly higher.

FIGURE 14: COMPARISON OF SPINNING PERFORMANCE



A major objective of this study was to investigate the nature of spinning breaks and their causes. To this end, each spinning break was analyzed and classified into the following categories:

Trash-related:

Bark: a long, thin fiber-like piece of woody material found in either yarn tail or rotor (for example, see Plate 2 [insert]).

Seed coat: a small portion of brown/black trashlike material to which a fiber's fuzz was attached, found in the yarn tail (for example, see Plate 4).

Trash: brown or black organic material, non-fibrous in appearance, located in the yarn tail (for example, see Plate 3).

Entanglement-related:

Nep: an apparently fibrous entanglement or bundle whose length and width are small yet approximately equal, found in the yarn tail.

Slub: a fibrous clump, generally several times longer than it is wide, present in the yarn tail.

Foreign Material:

fragments of matter which clearly do not have origin in the cotton plant, e.g. a polypropylene bale bagging, hair, etc. (for examples, see Plate 1).

Mechanical:

an interruption to the spinning process from non-textile causes, e.g. winding zone breaks, from either excessive or insufficient tension.

Unknown:

those interruptions for which no cause can be identified, typically involving a tapering tail of yarn.

Uninspected Breaks:

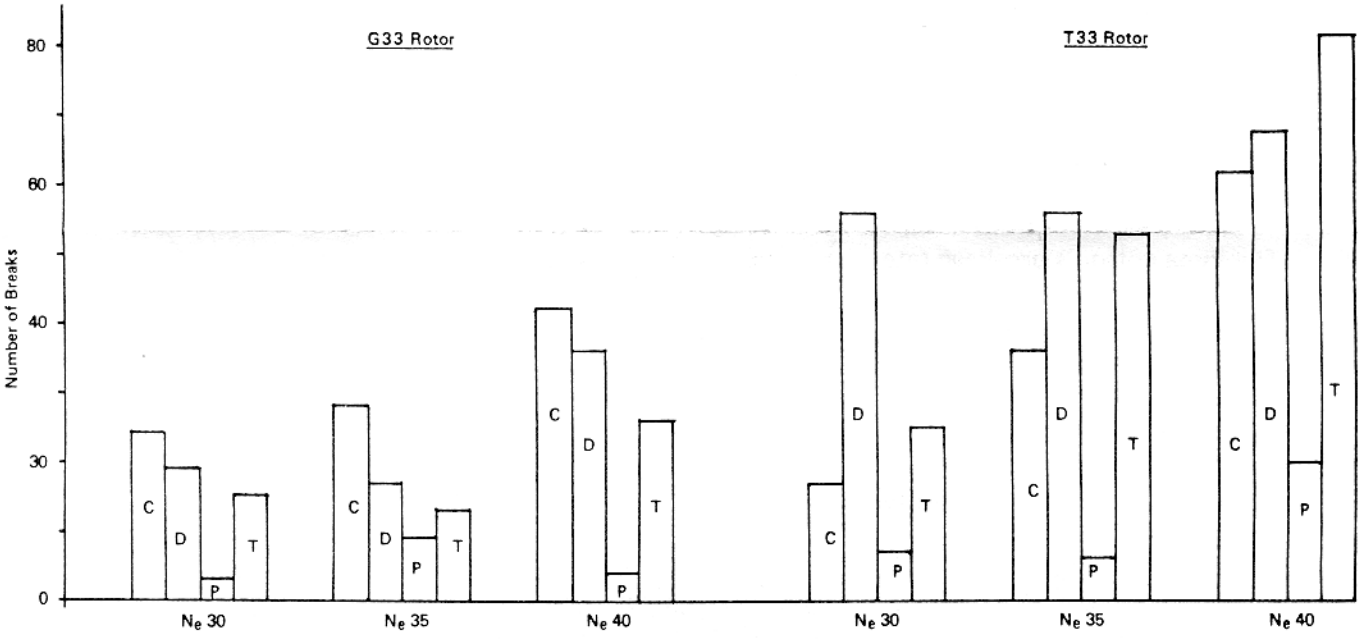
those spinning interruptions which were repaired by the ASW (automatic piecing device) before an inspection could be made.

The breakage rate analyses cover 500 rotor hours for each test, so that a total of 1000 rotor hours from both studies are available for comparison. This represents a sizeable sample and probably the largest scale attempt to date to appraise the effect of foreign material in cotton on high-speed rotor spinning.

6.1. BARK–RELATED INTERRUPTIONS

Yarn breaks associated with strips of bark or stem were fairly frequent for all cottons other than Pima. The frequency of bark-related breaks increased with the yarn count and was also dependent upon the rotor type used. These trends are depicted in Figure 15 below.

FIGURE 15: INFLUENCE OF COTTON TYPE AND YARN COUNT ON NUMBER OF BARK–RELATED BREAKS

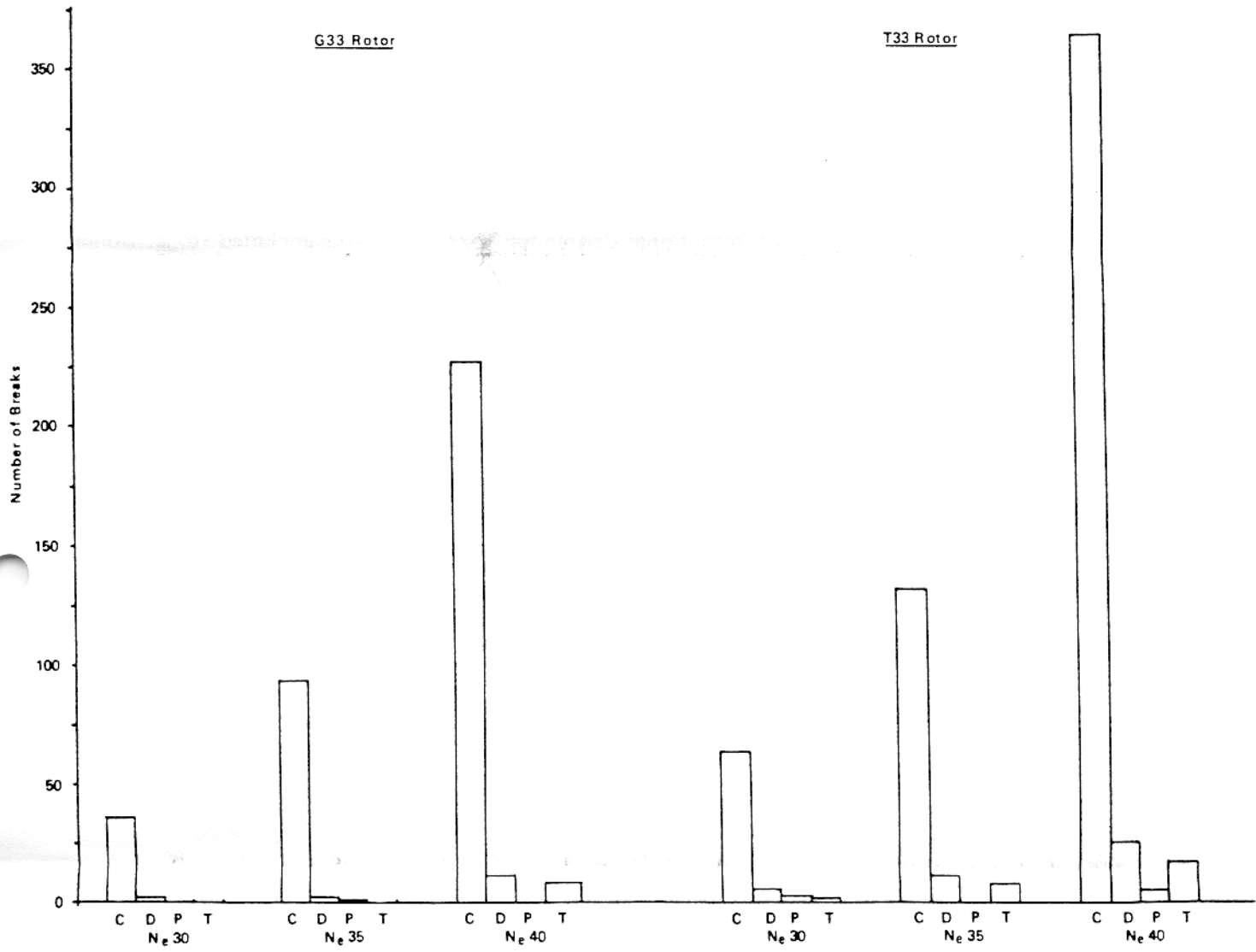


6.2. BREAKS RELATED TO SEED–COAT FRAGMENTS

The incidence of seed coat fragments was clearly excessive in the California cotton, being associated

with more than 90% of the recorded breaks. This is shown in the bar charts, Figure 16. Their number was responsible for California cotton's giving the worst spinning performance of all four cottons, although it has other desirable fiber properties. Pima cotton was credited with the least number of breaks associated with this form of trash particle, followed by Texas and Delta cottons, in turn.

FIGURE 16. INFLUENCE OF COTTON TYPE AND YARN COUNT ON NUMBER OF BREAKS ASSOCIATED WITH SEED COAT FRAGMENTS



TEXCELLANA: A BLEND OF TEXAS COTTON AND WOOL The September 1987 issue of *Textile Topics* (Vol. XVI, No. 1) carried an item concerning a special blend of Texas cotton and wool that was developed at the International Center for Textile Research and Development. We mentioned that we had used wool shorn from sheep after 6-months' growth, which gave a fiber approximately 1½ inches long. We pointed out that while this wool has somewhat greater variation in length than cut or stretch broken worsted top, it spins quite well as the minor portion of the blend and is considerably less expensive than combed top.

We stated we would like for interested readers to have a sample of the denim we produced from the TEXCELLANA blend, but it was not practical to send a piece of fabric along with the 2,200 copies of *Topics* we mail each month. Therefore, we requested anyone interested to write for a sample.

Apparently quite a few people were interested, for we have sent out many samples of the denim.

Most requests have come from the United States, but we have had a number from other locations. These have come from Canada, Argentina, West Germany, England, Belgium, Italy, Switzerland, Brazil, Finland, the Republic of South Africa, Uruguay, Turkey and Iran. We are pleased with the broad interest in the denim produced from the TEXCELLANA blend.

Rather than the 14½-ounce denim that is traditionally used in jeans, we first produced a 9-ounce (per square yard) fabric for menswear. This has been used primarily in sport jackets. Subsequently, we developed a 6-ounce denim that is now being made into high-fashion ladies wear. Besides the usual denim blue, some of the fabric was woven in natural white and was then piece-dyed a variety of colors. These have been very popular with the designers.

Our belief that this blend has much to offer has been strengthened by the enthusiasm of those who have received fabric made from it. We continue to feel that spinning short-shorn wool in blends with other fibers on the cotton system is a practical way to produce quality yarns and fabrics. We invite anyone interested in more information on this type of wool to write. We will be pleased to furnish details that may be useful.

VISITORS February visitors to the International Center for Textile Research included Roger Bolick, Allied Fibers, Hopewell, VA; Dr. Robert Barnhardt, Dean of the College of Textiles, North Carolina State University, Raleigh, NC; Dr. Shirley Chater, President of Texas Women's University, Denton, TX; Carmen Jacobo, Mexico City, Mexico; Ed Bee, Board of Development, Corpus Christi, TX; and John Fisher, Robstown, TX.

Visiting groups included ten engineering students from Wilhelmshaven, West Germany; and 34 members of the Winters chapter of the Texas Young Farmers organization.

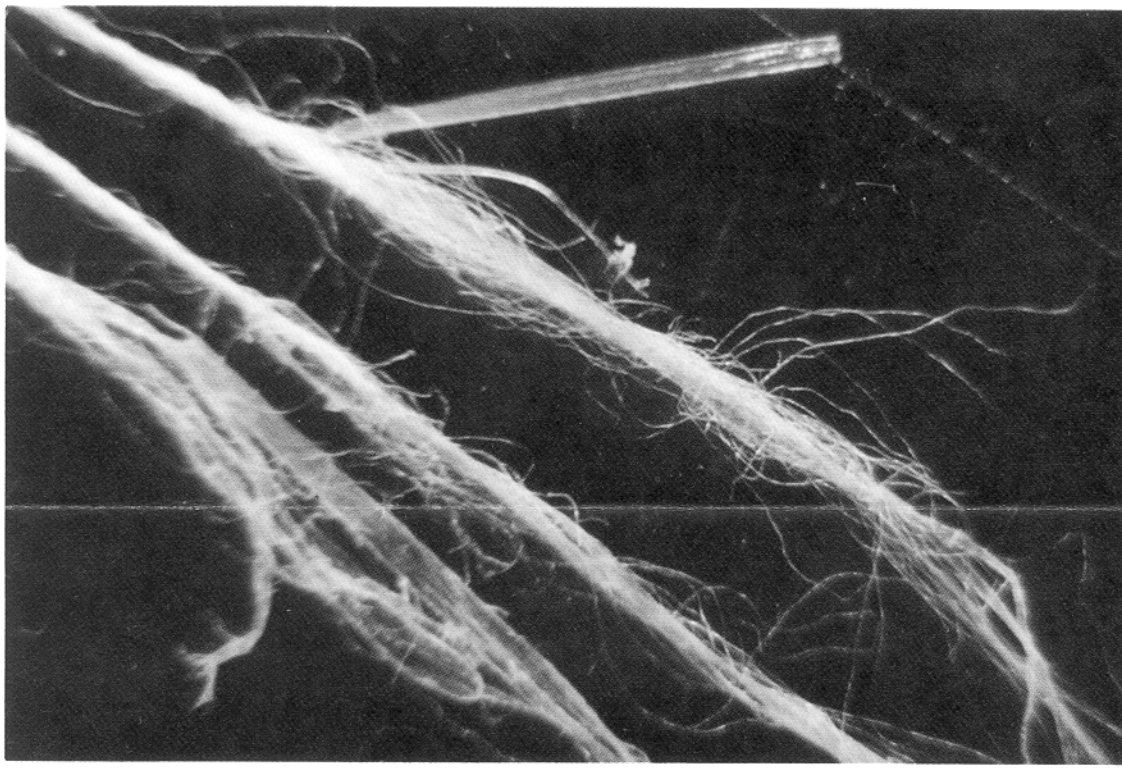


PLATE 1: Fragments of Polypropylene Bale Bagging

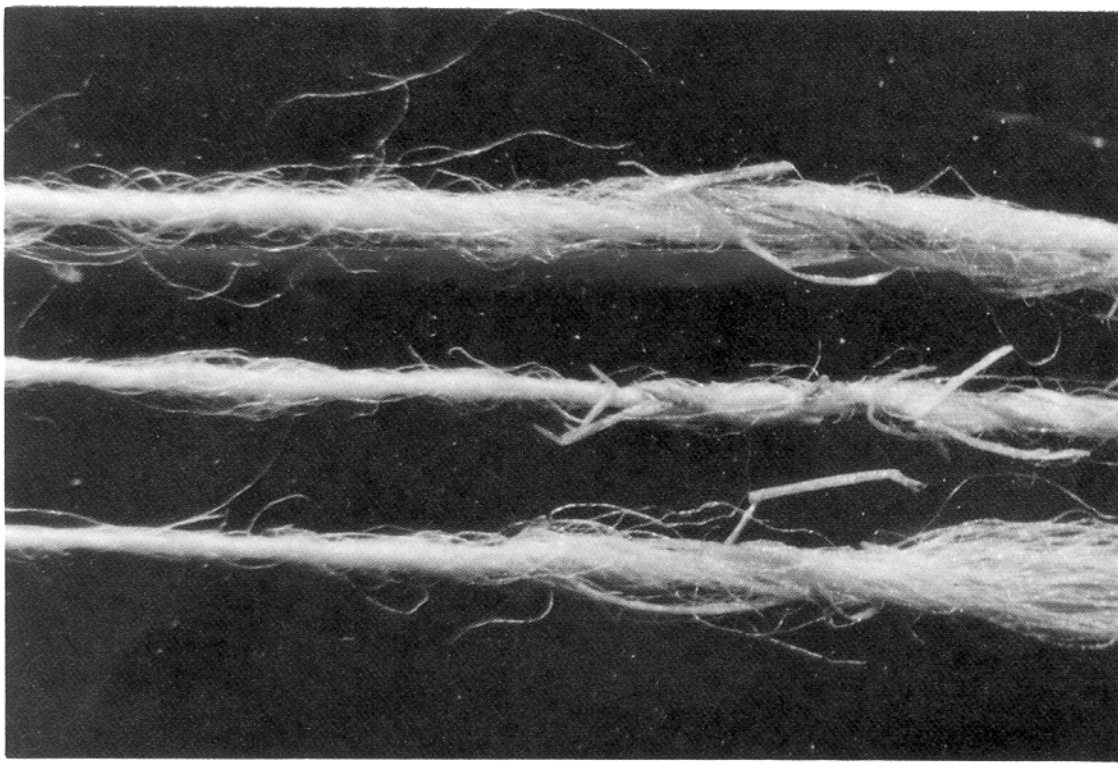


PLATE 2: Fragments of Bark

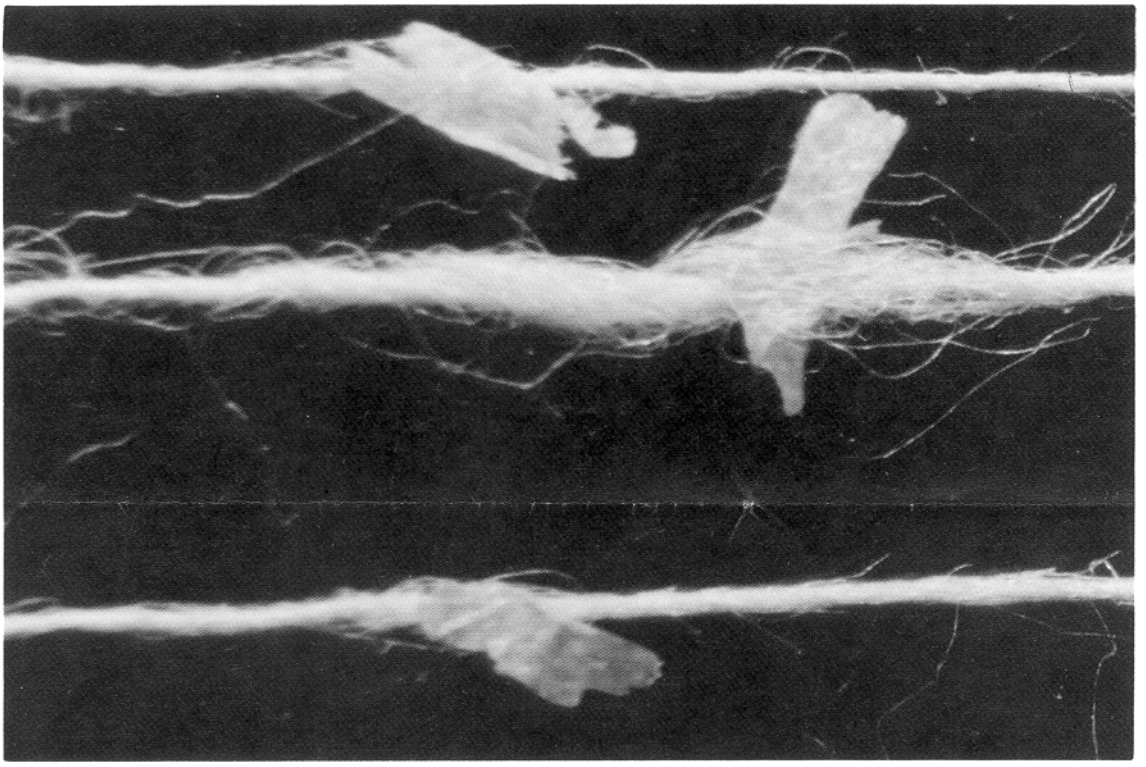


PLATE 3: Trash Particles

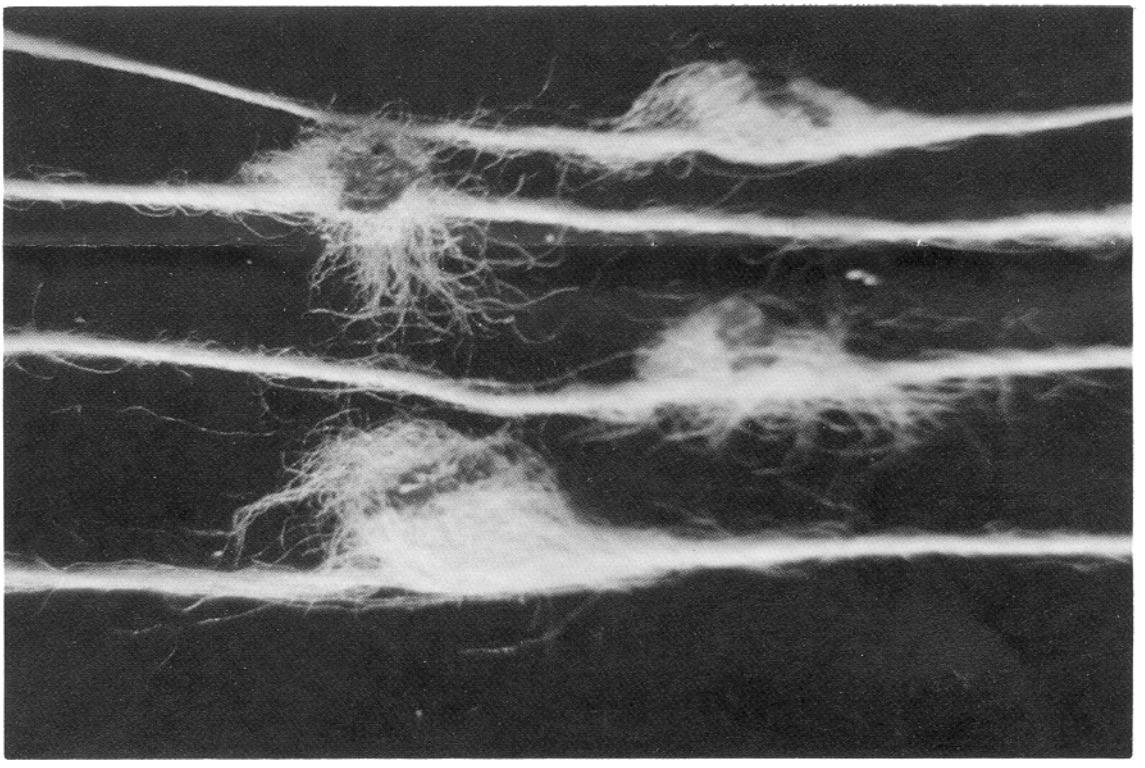


PLATE 4: Seed Coat Fragments