In most of the samples of machine-dressed flax, the fibre, even though very strong, breaks short across without breaking up into smaller-sized fibres.

The appearance under the microscope in such cases is like the broken end of a straw, and indicates that cellular matter and the dried juices of the plant are still present binding the fibres together, and that, by their liability to chemical and hygroscopic change, they will tend to injure the fibre.

In the case of samples of fibre that have been prepared by a chemical re-agent, steeping, steaming, or fermentation process, the broken end presents a brush-like appearance, showing that the lateral adhesion has given way before the minute fibres themselves broke. This appearance differs in various samples, and varies also according to the velocity with which the break is effected.

Fibres which have this character are not necessarily weaker on the straight strain than the others, while their superior softness and flexibility greatly increase their strength when spun or twisted.

So far as the experiments already made afford an indication, it appears that the object which should be aimed at by the manufacturer is to reduce the fibres and render them independent, so far as they are bound together by cellular matter or the dried juices of the plant, but to avoid if possible separating or fraying out the more minute and shorter fibres which appear to be bound together to form the long close fibres only by atmospheric pressure.

Notes on the Samples Examined.

No. 1. Russia hemp, clean and long.

No. 2. Manilla, very fine sample.

No. 3. Maori-dressed; half a hank; length 4 feet; uniformly white, with silky lustre; fibres downy.

Microscopic—Fibres free, rough in outline, form adherent, cellular tissues; fasciculus broken up.

Nos. 4 to 11. Samples of Maori-dressed flax, not examined.

No. 12. Prepared by a steaming process; small hank; length 6 feet; colour red at base, yellowish white at tips; soft and flexible, but the sample appears to have been rubbed; fibres moderately downy; very free from boon; lustre deficient.

Microscopic—Fibres free and hair-like; fasciculus broken up; no adherent tissue.

No. 13. Prepared by modified retting process; small hank, length 4 feet; greenish; flexible but harsh, and with little lustre; fibres downy; no boon.

Microscopic—Fibres straight and adherent, rough by the attachment of dark bands of connective tissue.

No. 14. Scraped by machinery and soaked; very small sample; length 3 feet; tips and butts cut off; soft, flexible, and downy, but deficient in lustre.

Microscopic—Fibres broken into short lengths; not free; rough from adherent tissue.

No. 15. Machine-dressed, and then treated with chemical re-agents; very small samples; soft but dull, like cotton waste.

Microscopic—Fibres divided freely; very flexible, but breaks short, with ragged ends.

No. 16. Passed through the stripping machine, steeped, sweated, and scutched; one hank; length, 7 feet; very bright and soft; white, with a gray tint; glossy; fibres downy.

No. 17. Chemically prepared; small sample cut to a short length; soft, dull, even in quality; dark-green, gray.

Microscopic—Fibres free, but arranged in non-adherent bundles; tabular structure of the minute fibres preserved; no connective tissue.

Machine-dressed.

No. 21. One hank; length 5 feet; colour reddish yellow; bright but harsh; young flax.

Microscopic—Fibres adherent, drawing out slightly, but at last breaking short; band of connective tissue adherent.

No. 22. One hank; length 9 feet; colour reddish; bright but harsh; breaks short.

No. 23. One hank; length 4 feet; colour yellowish white; bright and soft, but great difference in the fibre from the butt and that from the tip, which is like tow; breaks short.

Microscopic—Fibres adherent; breaking short in bundles of five or six fine fibres; cross-barred by tissue.

No. 24. One small hank, unscutched; length 9 feet; colour reddish yellow; fibres unequal in size, bright but harsh; breaks short without down.

Microscopic—Fibres adherent; snaps in bundles, with cross bands of connective tissue.

No. 25. Half-hank; length 6 feet; colour reddish; soft and bright but unequal; breaks short without down.

No. 26. Small hank; length 4 feet; colour red; harsh and unequal; not well scutched; larger fibres divide freely.

Microscopic—Fibres adherent; breaking short in large bundles.

No. 27. Half-hank; length 6 feet; colour yellowish white; bright but slightly harsh; breaks short.

No. 28. Half-hank; length 5 feet; colour pale reddish yellow; fibres coarse, downy, but do not divide freely.

Microscopic—Fibres adherent and break short in bundles, but they fray out along the sides; much connective tissue.

No. 29. One hank; length 6 feet; colour reddish yellow; harsh, unscutched, breaks short.

Microscopic—Adherent in granular bundles, which break short in unequal lengths.

No. 31. Fourteen hanks; length 6 feet; colour reddish yellow; bright but stiff; quality unequal in the length; breaks short.

Microscopic—

No. 32. Small sample in short length; white, transparent and flexible, in hair-like fibres, which fluff in breaking.

No. 33. Small sample; length 6 feet; colour reddish white; bright and soft tips; breaks short, but splits.