BIOCHEMICAL JOURNAL

ERRATA

VOLUME XXV

Page 1075, 5th para., last line :

for 5.5% read 6.1%

Page 1076, 1st para., 7th line :

for 60.5% read 61.1%

Page 1076, last para., 5th line :

for foregoing read following

CXXI. NOTE ON THE SULPHUR-FREE NATURE OF MEDULLA IN BLACKFACE WOOL.

BY JOHN BARRITT AND ALBERT THEODORE KING.

From the Chemical Laboratories, The Wool Industries Research Association, Torridon, Headingley, Leeds.

(Received June 22nd, 1931.)

THE presence of a medullated core is a well-known characteristic distinguishing the coarser (kempy) types of wool fibre from the fine merino type comprised only of scale and cortex.

Knowledge of the nature and amount of this medullary substance was confined to qualitative microscopic observation prior to the figures derived by Barker and King [1926] from a comparison of observed fibre diameters with those calculated from length, weight and density determinations.

The close agreement of the two methods, when non-medullated fibres are employed, falls off in proportion to the extent of medullation, but this circumstance provides a means of calculating approximately the relative proportions of medulla substance, air space, and non-medullated substance (cortex and scale) contained in a medullated fibre.

Blackface wool fibres were employed, as the remarkable regularity of both medulla diameter and total fibre diameter makes them eminently suitable for the measurements concerned.

From a series of measurements, detailed in the paper referred to, on typical medullated fibres (excluding heavily or only slightly medullated fibres) the following values were calculated:

mean percentage of air space to total fibre volume approx. 55.0 %;

mean percentage of air space to volume of medulla substance approx. 90 %.

Thus the average content of actual medulla substance in these fibres is 5.5 %.

Determinations of sulphur content [Barritt and King, 1926] of the bulk sample of moderately medullated fibres from which the fibres for the above measurements were drawn gave 3.33 %, while that for fine unmedullated fibres from the same portion of the fleece gave 3.82 %. From these values, making the assumption that the sulphur content of the cortex and scale portion is the same for both medullated and unmedullated fibres (i.e. 3.82 %) an equation relating the medulla channel and the sulphur content of the actual medulla substance can be derived as follows.

Let X = % volume of medulla channel in total fibre volume,
and Sm = sulphur content of medulla substance,

then $\frac{X}{10} Sm + (100 - X) 3.82 = \left(100 - X + \frac{X}{10}\right) 3.33$.

Hence $490 = X (8.23 - Sm)$.

Taking arbitrary values of Sm the following values of X are obtained:

Sm	X
0	59.5
1	67.8
2	78.6
3	94.0

The figure of 55 % obtained by Barker and King for the average air-space in the medullated fibres corresponds to 60.5 % of medulla channel, which is in striking agreement with the calculated figure of 59.5 % assuming zero sulphur content in the medulla substance.

Reviewing the possible sources of error which might combine to make this agreement merely a coincidence, the actual measurements and sulphur determinations are regarded as of sufficient precision to preclude any appreciable error in the figure deduced.

The assumptions necessarily made are, firstly, that the density of the medulla substance is the same as that of the unmedullated fibre. Widely differing types of wool fibre have practically identical density values [King, 1926] and the density of dry gelatin, 1.34 [see Svedberg, 1930] and of protein matters generally is not very different from 1.30 for wool substance, whereas only a wide divergence would seriously affect the result.

Secondly, it has been assumed that if the scales and cortex differ in sulphur content, any variation in the relative proportions of scale and cortex will not seriously affect the sulphur value. This can only be decided when unscaled fibres [King, 1927] can be analysed for sulphur content.

Thirdly, alternatively to the assumption made that the sulphur content of the unmedullated portion is the same as of the non-medullated fibres, a generally lower value in all the components of the medullated fibre would of course equally explain the difference in actual sulphur values. The direct evidence advanced in the foregoing paper however, affords a very strong substantiation of the mathematical deduction that the sulphur content of medulla substance, if not actually *nil*, must be extremely low in comparison with that of scale and cortex.

REFERENCES.

- Barker and King (1926). *J. Text. Inst.* **17**, 68 T.
 Barritt and King (1926). *J. Text. Inst.* **17**, 394 T.
 King (1926). *J. Text. Inst.* **17**, 53 T.
 — (1927). *Biochem. J.* **21**, 434.
 Svedberg (1930). *Trans. Far. Soc.* **26**, 691.