

forthcoming from differences in fibre pigmentation to warrant their adoption as criteria in the differentiation of species of *Ovis*.

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¹ NATURE, Jan. 23, p. 128.

² *Annals of Applied Biology*, 1921.

³ *Jour. of Genetics*, 1924, 1926, 1928, 1930, 1931.

⁴ *Jour. of the Textile Institute*, 1927.

⁵ *Ibid.*, 1930.

DR. NICHOL'S letter confirms the value of the observations on the sheep which I have, simply for convenience, designated *Ovis astore* in my letter in NATURE of Jan. 23. I am still in the midst of my investigations into Kashmir wools for the State Government, but there is already evidence that in a certain district all, or nearly all, the sheep carry double-coats of wool.

About 1912 I was associated with the late Prof. T. B. Wood, of the University of Cambridge, in his experiments in crossing Merino sheep with Shropshire. Messrs. Bailey and Engledow came to work with me at Bradford and got out possibly the first diameter frequency distribution curves published with reference to wool. These showed two modes giving the suggestion that two types of fibres—Merino and Shropshire—were being grown in the same (crossbred) fleece. Three years ago I also experimented with the Wembley Merino crossed Lincoln wool. On combing this, the 'top' was very like Lincoln wool and the 'noil' very like Merino wool! Iceland wool is noticeable as yielding a coarser outer-coat fibre and a more valuable under-coat fibre. None of these examples corresponds with *Ovis astore*.

I am surprised that Dr. Nichols does not cite such a sheep as the Rough Fell sheep, which, about July, shows an outer-coat growth, and at the roots of the outer-coat fibres an under and shorter wool growth. This under-growth, however, is of fine wool, whereas the *Ovis astore* under-growth is of coarse wool and is sometimes pigmented and sometimes white. Possibly Dr. Nichols has had this phenomenon under his eyes and missed it, as I did until coming across *Ovis astore*. The Black-headed Persian is much in evidence in Kashmir and is also being used for crossing in South Africa. Among the woolled skins I have from South Africa is that of a Black-headed Persian × Suffolk Down (twice crossed). This shows a pigmented under-growth of strong fibre. Whether there has ever been the outer-growth of strong hair-like fibres or kemp I cannot say, but it is very probable.

Prof. Cossar Ewart and myself were among the first to recognise the kemp birth coat of Merino lambs as possibly the outer-coat of the wild sheep, and it may be that *Ovis astore* will bring into prominence the time of shedding of this outer-coat—early or late. The stronger outer-coat of *Ovis astore* certainly seems to correspond with the black outer-coat of the Black Wolf—the phenomenon of growth is apparently the same in both cases.

Dr. Nichols is scarcely kind either to himself or to me in suggesting that I have mistaken a thickening of the normal wool fibre for a stronger under-growth, and a colour-banding of the normal fibre for a coloured under-growth. This latter phenomenon I became acquainted with some thirty years ago, and I have also read and adjudicated upon Miss Boyd's thesis on this subject.

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Inheritance of Milking Capacity

MR. MADSEN'S letter in NATURE of Jan. 30 contains much interesting information, based, as it is, upon data unusually numerous and comprehensive. It is with regard to his conclusion concerning the evidence of transmission of some factors for milk-inheritance in a sex-linked manner, based upon the difference in the correlations of the sires to their paternal grand-dams (0.026) and their maternal grand-dams (0.112), that I should like to make two points.

(1) The small correlation to the paternal grand-dam (0.026) might be explained by the choice of the sires by genotypic rather than by phenotypic methods; the merits of the progeny test having been for some time widely recognised in Denmark. The insufficiency of a single cow's record (because it is the expression of a phenotype) in foretelling the production of her progeny, has been stressed by many investigators, and it is doubtful if one should expect to find a significant difference in the correlations of two such records diluted through three generations.

(2) The difference between the correlation coefficients, 0.026 and 0.112, is not significant. From the data tabulated it appears that such a difference would be likely to occur by chance once in ten times. The odds are, therefore, not great enough to warrant the postulation of sex-linkage for some factors, from the data used.

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Contact of Smooth Surfaces

As the result of experiments described in the December number of the *Proceedings of the Royal Society*, Messrs. Bastow and Bowden conclude that "When a finely polished plate is lowered on to another polished surface . . . the top plate will sink until the two surfaces are in close contact. The apparent 'floating' at a height of 4μ is due to dust or particles between the plates". The implication is that the floating is due to particles with a diameter approximating to 4μ . With the conclusion I agree, since, in spite of many attempts, I have never succeeded in reproducing Sir William Hardy and Miss Nottage's results with carefully cleaned surfaces; with the implication I disagree entirely. In the case of metal plates, the somewhat elaborate apparatus used by Messrs. Bastow and Bowden is quite unnecessary. All that is required is to clean the plates with reasonable care, exposed to the air of the room, and lay one on the other as gently as possible. It will then be found that they are in electrical contact.

In my experience¹ it is only with slightly contaminated surfaces that the floating effect is observed, but the point is that the thickness of contaminant is far less than the distance between the plates. When artificial 'dust' in the form of glass fibres is introduced into the gap, the width of the latter increases and is greater than the thickness of the fibres. A film of grease 1μ in thickness is easily visible on a polished plate, while fibres 4μ in diameter can be seen without particularly good eyesight. Messrs. Bastow and Bowden have made no measurements of the size of the 'dust' which they were 'sometimes' able to see. Surely they do not accuse former workers on this subject of such carelessness that they failed to observe particles 4μ in diameter; yet if they admit that floating is due to particles of smaller size, the problem remains *in statu quo*.

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Indian Institute of Science,
Bangalore, Dec. 31.

¹ *Proc. Roy. Soc., A*, 123, 195; 1929.