

June 5<sup>th</sup>. 1934.

DEPARTMENT OF  
ZOOLOGY AND COMPARATIVE ANATOMY,  
UNIVERSITY MUSEUM, OXFORD.

My dear Fisher,

I was so glad to see you on Sunday, and it was really a wonderful interest to go through the poultry. It is not often one has the chance of studying a well planned experiment; I am certain it will be a very fruitful one - and on the lines that interest me most.

I am sending a few references which seem to the point, adding a short summary of the parts which strike me most in each. Of course you have probably read them all yourself: I fully realize that, so don't think I am insulting your card index! But it seemed just worth sending them on the chance you have missed one, for I know how easy it is to pass these things over.

*pp. 36  
or 10*  
Dunn, L.C. & Jull, M.A. (1927), "On the inheritance of some characters ~~of~~ the silky fowl", J. Gen., 19, 27-63.

pp. 31-2. Silky X Leghorn F2, 46 crest: 16 normal; does not mention hernia among these crest; but as he discusses hernia later, he is quite likely to have omitted them here.

pp. 40-44. In F2 from Silky X Leghorn he finds

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hernia appears much below expectation, this being largely due to a deficit among the males (only 2 were males out of 16 sexed; the other 3, then, were most likely females). Counting ~~males~~ <sup>females</sup> alone, he gets an approach to a 3:1 ratio - 65:14(+3?).

He believes the hernia males usually die early, but from Dunn & Landauer (1930) it seems that hernia is often so slightly expressed in the male that it can easily be passed over. No doubt this partly accounts for the sex distribution here.

Hernia extracted from silky is phenotypically similar to that in Polish, but no sex difference in the latter, at the present day. Darwin quotes Blumenbach to say that early last century (1805) only female Polish were crested (compare, of course, sex distribution of hernia in silky today).

Have you come across the work of Ghigi, A. (1914), Arch. Zool. Ital., 8, 46-89, who found considerable variation in hernias extracted in F2 from Polish crosses, and showed that the size of the hernia could be increased by + selection?

Dunn, L.C. & Landauer, W. (1930), "Further data on a case of autosomal linkage in the Domestic Fowl", J. Gen., 22, 95-101.

Find~~s~~ linkage between dominant-white, cerebral hernia, and polydactyly in cross white Leghorn X Silky.

pp. 95-7<sup>They</sup> find~~s~~ the expression of hernia very variable, and only expressed in 60% of those F2 from Silky crosses which are "theoretically pure for the hernia gene". By + selection he increased the expression up to 80 or 90%.<sup>They</sup> Also find~~s~~ that it is much less often expressed in the male than in the female, for in the male "a careful morphological study" is necessary to detect it. With more minute study, the sex distribution is here improved to: males 134:12, females 153:39.

Under this heading the authors discuss the possibility that crest and hernia are due to the same gene, which was suggested to them by the fact that all birds with hernia are also crested. They reject the possibility on the ground that they found one instance in which an uncrested fowl had transmitted hernia (naturally one would wish to ask to what extent crest is itself variable in expression; this they do not mention

and I don't know, do you?). They further regard crest and hernia as separate genes because they say that hernia and dominant-white are closely linked, while dominant-white and crest appear to assort independently. This, however, is contradicted by Hutt, F.B. (1933), Genetics, 18, 82-94 who places dominant-white, hernia, Frizzle, and crest in one linkage group.

Dunn and Landauer (l.c.) link polydactyly with hernia, but Warren, D.C. (1933) Genetics, 18, 68-81 places dominant-white and polydactyly in different chromosomes. He adds however that the linkage may have been too loose to detect in his work in certain cases, so this does not seem to mean much!

Suttle, A.D. & Sipe, G.R. (1932) J. Hered., 23, 135-42 confirm Hutt in that they place Frizzle and Crest in the same autosome, and state further that they are about 28 units apart.

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It is of course possible that hernia in Polish and that extracted from Silky may be different genes. On the other hand it is more likely, I feel, that they are

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the same. Both are easily modifyable and, if Blumenbach is to be trusted, both are more easily expressed in the female.

It would be great fun/ if, as seems likely, we have here the same gene repressed by selection in Silky and exaggerated by selection in Polish, in which it has become a breeder's point. Really it would round off the matter rather nicely to determine their identity or otherwise by a Silky X Polish cross.

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Tucker knows of no collection in which Silky skulls might be found, so I am pretty sure there is none in any obvious place. He is making enquiries to find if there is material in any research institute or the like.

Yours sincerely,

*J. B. Ford*