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Some Morphological Observations of Rumpless Fowls

By

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Rumplessness or total absence of the tail in the fowl has repeatedly been reported upon by several authors as one of the most striking and interesting characters among varieties in the domestic fowl (DAVENPORT '06, LIBON '11, DU TOIT '13, DUNN '25, LANDAUER & DUNN '28, DUNN & LANDAUER '34, '36, *etc.*). Externally the most marked divergence of rumpless from normal fowls is the absence of the long tail feathers. According to DUNN '25 and LANDAUER & DUNN '25 there are two types of rumplessness in the fowl. One type is hereditary rumplessness and inherited as a dominant trait: the other is accidental rumplessness which is not heritable in character. These two different types however, present no visible difference in general external appearance.

The present author had the opportunity to obtain five rumpless fowls, three hens and two cocks, from a breeder at Sapporo in 1930 and 1932. They appeared sporadically as an occasional occurrence in a flock of normal tailed fowls from the White Leghorn stock. Some genetical experiments have been made with these rumpless fowls, the results of which, now in preparation, will be published in the near future in the Japanese Journal of Genetics. In the present paper will be given some account with regard to the morphological characters of these rumpless fowls.

So far as appears in the literature, LIBON ('11) seems to be the first author who dealt with the morphological observations of rumplessness. In 1913 DU TOIT made detailed observations on the morphology of rumplessness. Then LANDAUER & DUNN ('25) made a detailed morphological comparison between the bones and musculature of the two types of rumplessness, hereditary and accidental and of the normal fowl. A little later LANDAUER ('28) published some morphological observations of intermediate rumplessness. The present results are mostly agreeable in essential points with those of LANDAUER & DUNN ('25), so that only brief descriptions are given below, with photographic illustrations.

General appearance: From Figs. 1 to 5 show five rumpless fowls under

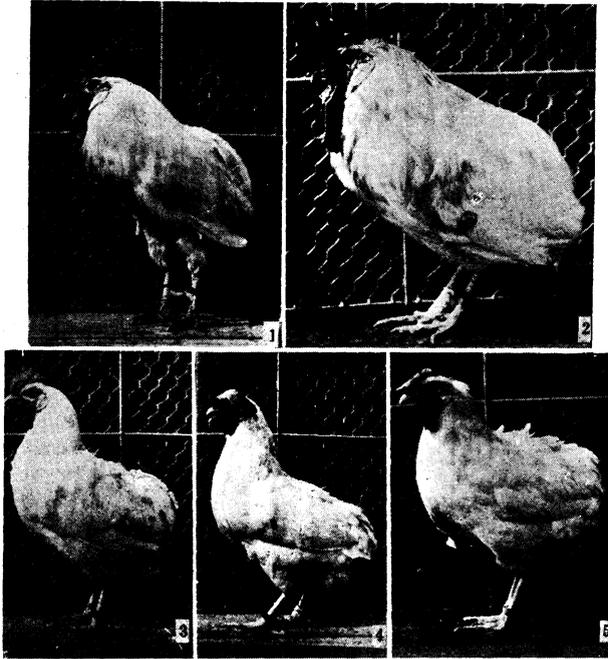


Fig. 1. Rumpless cock, No. 104. Fig. 2. Rumpless cock, No. 105. Fig. 3. Rumpless hen, No. 101.
 Fig. 4. Rumpless hen, No. 102. Fig. 5. Rumpless hen, No. 103.

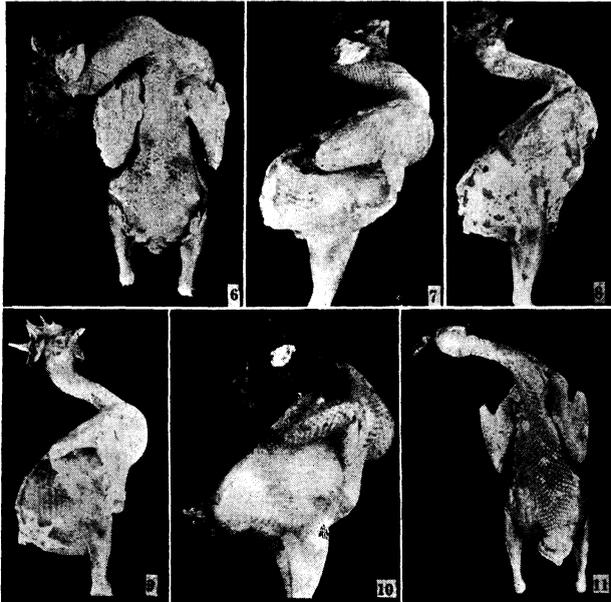


Fig. 6. Rumpless cock, No. 104. Dorsal view. Fig. 7. The same, lateral view. Fig. 9. Rumpless hen, No. 102. Lateral view. Fig. 10. Normal tailed cock, lateral view. Fig. 11. Normal tailed hen, dorsal view.

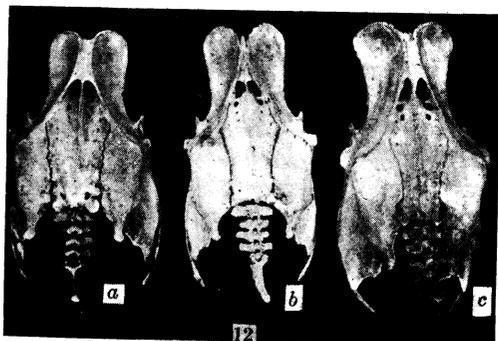


Fig. 12. Pelvic bones of normal fowl, all dorsal views. *a*, *b*: female. *c*: male.

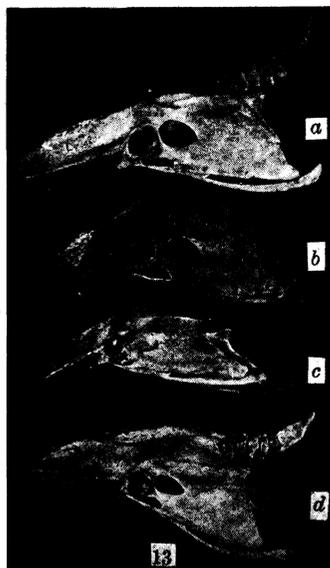


Fig. 13. Lateral views of pelvic bones.
a: normal male. *b*: rumpless male, No. 104.
c: rumpless female, No. 103. *d*: normal female.

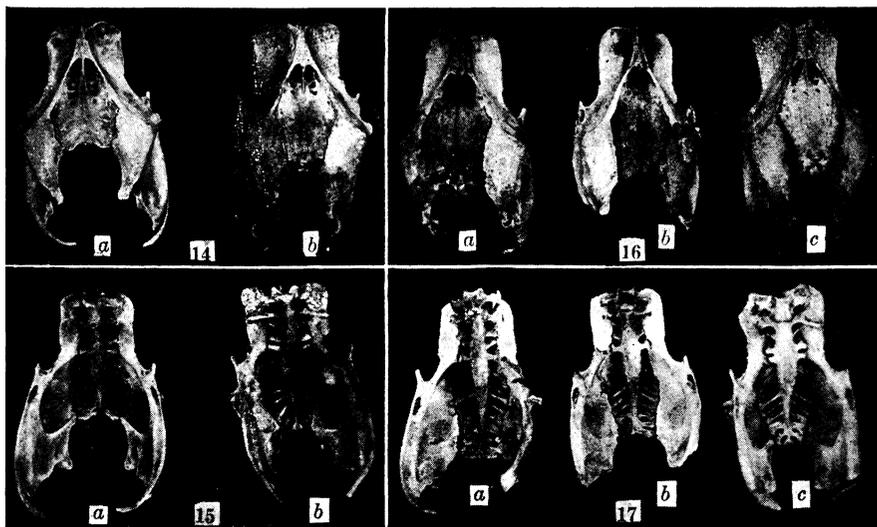


Fig. 14. Pelvic bones of rumpless fowls; both dorsal views.
a: No. 103, female. *b*: No. 104, male.

Fig. 15. The same as Fig. 14; both ventral views.

Fig. 16. Pelvic bones of rumpless fowls; all dorsal views.

a: No. 101, female. *b*: No. 102, female. *c*: No. 105, male.

Fig. 17. The same as Fig. 16; all ventral views.

investigation, two cocks and three hens, all being White Leghorn breed. The rumpless fowl generally assumes a rather erect posture in comparison with the normal tailed fowl, due probably to the absence of the tail. It seems probable that this erect posture comes from an adjustment in the equilibrium of the body.

The posterior end of the body of the rumpless fowl is fully rounded (Figs. 6-9). In the region where the tail vertebrae are situated normally, there is an elongated cavity. The skin of the cavity is distinctly continuous with the body wall. There is seen no slight elevation of the skin in the region of the tail. These external features are clearly shown in Figs. 6 to 9, and will be well understood by comparison with the normal tailed specimens (Figs. 10-11).

Generally the feathers of the tail are completely absent in the rumpless fowl (see Figs. 1-5). In the male the feathers of the saddle are somewhat longer than in the normal fowl.

The rump gland: No slight trace of the rump gland or oil gland was found in its original position in the rumpless fowls examined in the present study (see Figs. 6-9). This is quite accordant with the observation of LANDAUER & DUNN ('25). LIBON ('11) observed accumulations of fat in the region which is normally occupied by the rump gland, stating that this fat accumulation represents the remains of the gland. Such like structure was entirely absent in the present material.

The skeleton: Since the deficiency in structure of the caudal vertebrae is the primary factor to produce rumplessness, it is in this region that one can find the most conspicuous deviations from the normal condition. The synsacrum of the normal fowl is composed of 16 vertebrae, and the tail consists of 5 free caudal vertebrae and a pygostyl (cf. Figs. 12-13). While in rumpless fowls, the free caudal vertebrae and the pygostyl are not completely present (Figs. 14-17). It is pointed out by LANDAUER & DUNN ('25) as a significant evidence of rumplessness that the last two vertebrae of the synsacrum (truly synsacro-caudal vertebrae) are also absent in the rumpless fowl. A similar structure seems to occur also in the present material except one case shown in Fig. 16, *c* (also Fig. 17, *c*), which involves some doubts in this respect. In fine, the skeleton of the synsacrum and tail of the normal fowl is constituted of 22 vertebrae in total, the pygostyl being taken as one bone, whereas the rumpless fowl possesses only 14 vertebral bones composing these parts. This deficiency of sacral and caudal vertebrae is the structural characteristic of the pelvis of the rumpless fowl. The anterior parts of the pelvis in the rumpless fowl are not different from the normal. Asymmetries of both sides, the ischium and ilium of the one side being comparatively larger, were noticed as a common occurrence in the rumpless fowl by LANDAUER & DUNN ('25). A similar condition is also

found among the present specimens herein described. On account of showing a high variability, further irregularities in the structure of the pelvis are found to be difficult to point out.

Though no special observation was made on the musculature in the region of the tail of the rumpless fowl, it seems probable that the descriptions of LANDAUER & DUNN ('25) in this respect may be applicable to the present material. Even in superficial observations most of the tail muscles seem to be entirely absent.

The results of the above observations of the rumpless fowl fall into a fair coincidence in essentials to those reported by LANDAUER & DUNN ('25) for two types of rumplessness, hereditary and accidental. Their observations pointed out that there could be established no differences in the morphological structures between the two types above mentioned. It may be necessary to state here that genetical experiments carried on by the present author show that rumplessness herein dealt with was a heritable character.

Some mention may be made here on the developmental condition of rumplessness. Primary interest is concerned with the developmental origin of rumplessness. From the examination on the rumpless embryos, LIBON ('11) stated that all of the vertebrae have normal anlage and that even on the ninth day of incubation all free tail vertebrae and the pygostyl are present. He concluded from these evidences that rumplessness is a result of resorption of vertebral anlage rather late in development, taking place on the tenth or eleventh day. DU TOIT's account ('31) is different from that of LIBON ('11). He made detailed examinations through all stages of the embryological development beginning with the third day and arrived at the conclusion that in the rumpless embryos the anlage of the vertebrae of the tail are not present from the beginning. It seems to the author that the interpretation of DU TOIT ('13) is most natural in considering the developmental origin of rumpless fowls, especially in the case of hereditary rumplessness.

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