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On the verminous pneumonia of domestic animals

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Therein I never used the word "subspecies," and I expressly stated that I counted *Lagopus scoticus* "as a species," though I was persuaded (as I still am) that "it is only *L. albus* modified to suit an insular climate"*. Furthermore, *L. mutus*, *L. rupestris*, and *L. hemileucurus* were not considered by me to have any such very near relationship to *L. albus* as I conceive *L. scoticus* to have.

Page 239, line 24. The "certain uniformity of tints" spoken of exists, except in the female, at one time of the year only, and even then is not applicable to *L. scoticus*.

Page 240, footnote. For "seems to entertain" read "entertains."

Page 241, lines 7, 8. The Black Grouse is far less "common in the mountains of Sweden and Norway" than it is in the lower districts.

Page 244, line 5. The statement that the Wild Swan "inhabits the Polar regions" gives a very incorrect impression; for most of the Wild Swans that visit Western Europe are bred in Iceland, altogether outside the Arctic Circle, while the species found in the Polar regions of America are most likely quite distinct from those which inhabit the Old World.

In noticing these errors I have omitted any reference to some others which have been already corrected in the concluding portion of the 'Reliquiæ Aquitanicæ' (p. 292); and I may perhaps be allowed to add that my sole object has been to contribute to the utility of that work. I certainly impute no blame to its learned Editor or to my distinguished friend M. Alphonse Milne-Edwards.

On the Verminous Pneumonia of Domestic Animals.

By M. E. BUGNION.

M. E. Bugnion communicated to the meeting of the Swiss Society of Natural Sciences, held at Andermatt in September last, some observations on the pneumonia produced in domestic animals by the presence of parasitic worms in the lungs, which seem to be of much practical interest. He insisted especially upon the different forms assumed by the disease according as it is caused by adult *Strongyli* or by ova and embryos. Up to this time he has observed:—

1. A *lobular form*, produced by adult *Strongyli* coiled up in the bronchi.

2. A *diffused form*, caused by ova and young larvæ of Nematodes scattered by thousands in the tissue of the lungs.

3. A *nodular or pseudo-tubercular form*, produced by the accumulation of the ova at certain limited points of the lung.

The first form was studied in the calves and heifers of the Jura, where this disease sometimes acquires an epizootic character. During the great slaughter ordered by the Government of the Canton de Vaud on the pastures of Neuvaz (Jura) in September 1874, on

* See also 'Encyclopædia Britannica,' ed. 9, vol. iii. p. 757.

account of contagious peripneumonia, M. Bugnion only ascertained fourteen cases of the latter disease in 170 head of cattle, while at least sixty (for the most part young animals) were affected with verminous pneumonia. This had a strongly marked lobular character and appeared throughout to be of recent date. On cutting into the bronchi, great numbers of filiform worms (*Strongylus micrurus*), measuring as much as three inches long, were to be found, generally coiled up in an accumulation of yellowish mucus. The bronchi occupied by the parasites are precisely those which correspond with the hepatized lobules.

The diffused form was observed in goats at the Veterinary College at Zurich. In one of these animals which died on the 22nd of May, 1875, the lungs no longer contained any adult *Strongyli*; but there were thousands of elongated ova about one tenth of a millimetre in length, and a great number of little worms very like *Trichinae* and invisible to the naked eye. These little parasites irritate the pulmonary tissue like so many foreign bodies, and cause a sort of diffused infiltration which is generally of great extent. The microscope shows considerable desquamation and proliferation of the endothelium of the air-cells, as observed by Prof. Böllinger ("Zur Kenntniss der desquamativen und käsigen Pneumonie," Arch. für exp. Path. und Pharm. Bd. i. 1873). The *Strongylus* of the cow is expelled from the lungs before oviposition takes place, and the young are developed elsewhere; but that of the goat (*S. filaria* or *rufescens*?) deposits its ova in the lung, and it is in that organ that the young larva passes through at least the first phases of its existence. Instead of disappearing in the winter without leaving any traces, this verminous pneumonia of the goat thus becomes a very serious chronic disease.

The author has studied the nodular form in a cat poisoned with strychnine. All the lobes of the lung presented, both at the surface and in the interior, a great number of perfectly circumscribed whitish tumours, in each of which the microscope revealed a myriad of rounded ova containing small rolled-up worms, embryos, or vitelline masses in all stages of segmentation. Here, again, these little foreign bodies, forming numerous colonies in the interior of the pulmonary tissue, had caused a most distinct desquamative pneumonia, although restricted to certain perfectly circumscribed parts. This observation in every respect confirms that of Henle upon which Leuckart threw doubt ('Die menschlichen Parasiten,' ii. p. 104). Other identical cases have been reported by Legros (Gaz. Méd., Paris, 1867, p. 131), Villemin (Recueil de Méd. Vét. 1867, p. 75), and Colin (Ann. de Méd. Vét., Brussels, 1867, p. 12). Similar nodosities also occur in the lungs of the goat, sheep, and pig. These animals present sometimes the diffused pneumonia, at others the small pseudo-tubercular tumours, according as the ova of Nematodes are scattered here and there or united in colonies at particular points.—*Bibl. Univ., Archives des Sciences*, December 15, 1875, p. 324.