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On the transmission and metamorphoses of the intestinal worms

MM. Milne-Edwards & Valenciennes

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sun was shining. It seems always active in the search for Diptera, on which evidently it chiefly feeds; and one reason of its preference for the cove by the Parson and Clerk rocks is, that a collection of the larger olive-leaved seaweeds is generally heaped up there for manure; on this heap, flies abound in mild weather throughout the year. The attachment to locality is however very marked in this species; they will be seen not only in a particular spot, but on a particular stone in that spot; they are fond of perching on some prominent point of rock, and from this they sometimes dart out upon any passing gnat, much after the manner of a flycatcher. Dipterous insects are no doubt their usual food, but in very cold weather they may support themselves on the sand-hoppers (*Talitrus Locusta*), since we have found these in the stomachs of stonechats killed on the beach. The male varies much in the beauty of its plumage, the specimen procured on the 30th of January being much more brilliant than those shot on the 3rd and 4th of the same month. The change may therefore be the commencement of its putting on a nuptial dress; there is however much difference between the other two, and one of them is probably in immature plumage, so that they are not in full feather until the spring.

It is curious to speculate on—why this bird should be a winter visitor and *Ph. ruticilla* a summer guest with us; probably the south coast of England would afford a greater supply of insect food during the depth of winter than could be obtained in Germany; yet this is scarcely sufficient explanation of the fact. Another question worthy of notice is, has this bird been overlooked in former years, or has it only lately been a visitor to our coast? Col. Montagu well explored the south coast of Devon, yet I believe he never met with it; we had frequently searched the shore for birds before 1844, yet we never saw it, nor had it to our knowledge been killed near Teignmouth.

April 30th, 1855,
Queen's Coll., Birmingham.

On the Transmission and Metamorphoses of the Intestinal Worms.
By MM. MILNE-EDWARDS and VALENCIENNES.

On the 30th April 1855, M. Milne-Edwards communicated to the Academy of Sciences of Paris the results of some experiments made by M. Van Beneden, in the presence of MM. Valenciennes, De Quatrefages, Haime and himself, in illustration of his views upon this interesting subject. The object of these experiments was to prove the transformation of the *Cysticercus pisiformis* of the rabbit into the *Tænia serrata* when introduced into the intestines of the dog; and they appear to have been perfectly satisfactory to all the members of the commission with the exception of M. Valenciennes, whose observations upon these phenomena follow those of M. Milne-Edwards.

The *Tænia serrata* is exceedingly common in adult dogs, but is

not found in these animals when very young. In his first experiment, M. Van Beneden used two newly-born puppies, and brought them up under exactly the same conditions, except that to one of them a certain number of *Cysticerci* were administered in his food, whilst these worms were carefully kept from the second. The *Cysticerci* were administered at three different times, viz. on the 12th and 23rd of March, and on the 21st April. These dogs were killed and opened on the 25th April, when the animal which had eaten no *Cysticerci* was quite free from the *Tænia serrata*, although the lower part of its intestines contained a single worm of a different species, the *Tænia cucumerina*. The other dog, to which the *Cysticerci* had been administered, contained three bundles of worms, which were regarded as the *Tænia serrata* by M. Van Beneden and the majority of the other observers. The bundle which was furthest from the stomach, and which was considered as proceeding from the first administration of *Cysticerci*, was composed of *Tænia*s which had nearly arrived at the adult state; the other two packets were less advanced, that nearest the stomach being the smallest, and regarded as produced from the *Cysticerci* last administered. The same results were obtained from another similar experiment; but as this had been going on for a much longer period (the first injection of *Cysticerci* having taken place on the 18th December), the *Tænia*s situated at the greatest distance from the stomach were not only larger than in the previous experiment, but had the generative organs well developed. In all these cases the number of *Tænia*s found in the intestines was less than that of the *Cysticerci* swallowed; thus, the first dog had received thirty-two, and the second seventy of the *Cystic* worms; but the former contained only seventeen, and the latter twenty-five *Tænia*s.

M. Van Beneden informed M. Milne-Edwards that he has repeated these experiments no less than thirteen times, and always with equally decisive results. Similar experiments have also been performed by Küchenmeister, Von Siebold*, and Leuckart, and always with the same success.

The objections raised by M. Valenciennes to the deduction drawn by M. Van Beneden and other authors from the observation of the above facts, namely that the *Cysticercus pisiformis* of the rabbit is the larval form of the *Tænia serrata* of the dog, repose principally upon the question of the specific identity of the parasite produced by the administration of the *Cysticerci* to the last-mentioned animal with the *Tænia serrata*, a worm which is so common, that, M. Valenciennes states, it may almost be predicted with certainty, that on opening a dog of four months old and upwards, this parasite will be met with. Previous experiments had proved to M. Valenciennes that the administration of the *Cysticercus pisiformis* to dogs "gives rise to a flattened riband, composed of numerous narrow articulations, and presenting at the first glance exactly the appearance of a *Tænioid*

* Annals, N. S., No. 60, Dec. 1852, p. 431.

worm, like the *Tænia serrata*." M. Valenciennes' observations agree closely with those of Von Siebold already given in this Journal (*l. c. supra*); but he states that the Tænioid worms produced from the *Cysticercus pisiformis* in his experiments never possessed generative organs, and the articulations never exhibited the genital pores situated on tubercles of the true *Tænia serrata**. In the case of the second dog referred to by M. Milne-Edwards, in which adult Tænias furnished with generative organs were found, M. Valenciennes states, that out of the twenty-five specimens of the supposed *Tænia serrata* there were only two in which the generative organs were developed; these he admits to have belonged to that species, but adds, that as the dog was greatly infested with worms of other species, he is by no means convinced that the two specimens of *Tænia serrata* furnished with generative organs were produced from the *Cysticerci* administered. He also remarks, in opposition to the opinion of Van Beneden and others, that the *Cysticerci* are the larval forms of Tænioid worms; that notwithstanding the abundance of the *Tænia serrata* in the intestines of dogs, even in towns, their opportunities of devouring the entrails of rabbits, the only situation in which the *Cysticercus pisiformis* has been found, are exceedingly rare; whilst, with regard to the *Cysticercus fasciolaris* of the rat, which is stated by Küchenmeister and Siebold to give rise to the *Tænia crassicollis* of the cat, he observes that the cystic worm in question is of very rare occurrence, although the *Tænia* said to be produced from it is to be found in almost every cat.—*Comptes Rendus*, 30th April 1855, p. 997.

Note on the Trichomonas vaginalis of Donné.

By MM. SCANZONI and KÖLLIKER.

Notwithstanding the numerous published observations on the *Trichomonas vaginalis* described by Donné, the true nature of this creature does not yet appear to be ascertained. Some regard it as an animal and place it amongst the Infusoria (Donné, Dujardin and Raspail), or amongst the Acarina (R. Froriep, Ehrenberg). The most recent observers consider the Trichomonads as epithelial cells detached from the uterus, and deny that they are animal organisms (Lebert, Valentin, J. Vogel, Von Siebold and R. Wagner). For ourselves, we must confess that we were amongst those who doubted the animal nature of *Trichomonas*.

But after having more attentively studied these formations, and the mucus of the generative organs in many individuals, we have ascertained that the mucus of the neck of the uterus never contains Trichomonads, which would not be the case if they were only vibratile cells. We have also seen that the Trichomonads resemble true Infusoria in every respect.

Before proving this last assertion we may say, that Donné's

* It is to be observed, however, that M. Valenciennes does not inform us of the length of time over which his experiments extended.