

Register October 5<sup>th</sup> 1885.

## PROFESSOR WATSON ON RABBIT DESTRUCTION.

TO THE EDITOR.

Sir—As all questions bearing directly or indirectly on the public good find full discussion in your journal, I venture to send you the following remarks on the rabbit nuisance. We are not in a position to look hopefully forward to the extermination of this pest, either in the immediate or the remote future, by any of the means at present in vogue. The labour involved in their application is so great that we must regard them rather as palliatives than radical measures, and as such, but barely sufficient to cope with the continual marginal spread of the pest in already infested districts, much less to prevent a possible dissemination of the evil at a distance by unscrupulous and interested persons. Complete extermination by direct violence such as shooting, snaring, &c., under existing conditions may be looked on as practically impossible, although it is true that wire fencing, acting as a preventative of invasion from without, facilitates the application of direct violence within; but under certain circumstances buck rabbits manage to scramble over more serious obstacles than wire fences. Rivers also, which are looked upon as even more restrictive than fences, are easily swum across by individuals of both sexes, as readily as by hares, kangaroos, emus, and pigs, when hard pressed by dogs. In flood-times, too, rabbits might also be drifted across streams in hollow logs, if we may judge from the fact of large fish being frequently found stranded a considerable distance inland, and we know also that rabbits have been ferried across rivers by dishonest men (See Register, September 15, 1885.) Having thus touched upon the more or less inadequate nature of fences and rivers to confine rabbits within given limits, it remains to consider what effects may be produced by the agency of poison.

The rabbit requiring no water when surrounded by green herbage naturally prefers fresh grass to dry oats (poisoned or otherwise) intentionally placed in its way, and will in all probability leave them untouched as long as the more succulent food is within its reach. It is only in times of drought that the animal being forced to moisten its meal of dry grass, and finding the neighbouring waterhole fenced off, falls a victim to poisoned water left in its run. A single dose of some deadly gas or volatile liquid (bisulphide of carbon), although it may exterminate a particular colony of rabbits, does not affect the neighbouring ones; and the process, at the expense of time, labour, and money, has to be repeated in every warren in succession. No doubt the wide-spread cultivation of a plant, which, while agreeable but deadly to the rabbit, would be innocuous to other animals, and which would thrive under the same varying conditions of season and place as its intended victim, would prove the most efficacious of remedies, but unfortunately for both squatters and farmers such a plant has yet to be discovered. The introduction of animals preying upon rabbits has been frequently mentioned, I suppose on the principle of the law of the survival of the fittest; but this

of the survival of the fittest; but this scheme to prove effective presumes an increase on their part in direct ratio to the decrease of the rodent they are called upon to destroy, and assuming that the rabbit was finally wiped out by their means, they themselves would remain to constitute a pest, necessitating drastic measures for its cure.

The introduction among rabbits of some form of disease such as *filaria*, *syphilis*, or *tuberculosis*, has been proposed, and rejected as dangerous to man, on the ground that it could only be compared to the scattering fire of a blunderbuss, which hits other objects besides that at which it is aimed; or to the introduction of the Colorado beetle or the locust for the purpose of eradicating the Scotch thistle, which while perhaps effecting their object ruin the surrounding crops. Of undoubted value would be the introduction of a fatal disease incident to rabbits alone—analagous in fact to one I remember as having caused sad havoc among the native dogs on the Upper Murray. No doubt one factor in the disappearance of those dogs was strychnine, but it was not poison alone which transformed the large red jocund-looking dingo into a poor hairless diarrhœic wretch, too weak to howl or even to escape from the stick of the weary swagman in whose path it happened to lie, much less to overtake as prey the light-footed bandicoot which crossed its own.

More directly connected with the subject under discussion was the total disappearance of a whole tribe of rabbits, the descendants of some score or more turned loose in 1858 under apparently the most favourable conditions all their wants being supplied by a bounteous nature in a protected glade on the Victorian side of the Upper Murray, where for two years, and notwithstanding the presence of dingo, iguana, and hawk, they increased and multiplied, but finally during the course of the third year disappeared. It might be impossible ever to make a retrospective diagnosis of twenty five years as to the cause of their death; but I am inclined to attribute it to a parasite, perhaps still to be found in Australia, but at any rate having its European prototype in the *Sarcoptes cuniculi* mentioned in the "Anatomie des Mammifères" by the illustrious biologist Krause. As his pupil I remember well the importance he used to attach to early topical treatment (Peruvian balsam, &c.) for the eradication of that parasite in rabbits brought to his laboratory for physiological purposes, as late treatment always proved in vain.

The following short description of the course of the disease induced by this fatal parasite may interest your lay as well as your medical readers:—

At first there is apparently little the matter with the rabbit. It soon, however, shows a few crusts about its face, which extend by continuity of epidermal tissue, as well as by auto-infection from scratching to more distant parts of its integumental surface. It begins to lose flesh from loss of appetite, unrest and slow septic intoxication resulting from the venous and lymphatic absorption of the products of a hitherto purely localized and easily curable cutaneous affection. Extensive suppuration, principally of the cervical and sub-maxillary lymphatic glands, corresponding to the lymphatic capillary areas of the face, supervenes. In like manner the absorbed toxic matter circulating in the blood induces coagulation and extensive thrombosis (plugging) in

and extensive thrombosis (plugging) in various parts of its venous system, and usually some low form of pneumonia intervening mercifully puts an end to its sufferings.

I propose therefore the introduction into South Australia of a few German rabbits infested with this parasite, thereby constituting a nucleus, which would soon produce the disease in some thousands of their Australian cousins. A stock of infected animals could thus be formed, from which samples could be distributed, and the propagation of a disease encouraged, which when left to itself leads infallibly to the death of the patient, and indirectly to that of his kindred.

In older animals this disease is relatively slow, lasting more than a year, but in consequence it allows them for a longer period to be a source of infection to their younger brethren, in whom there is a relatively greater predisposition to acquire the parasite, and in whom from some inherent pyogenic tendency on their part the resulting disease runs a more rapid but none the less fatal course.

The above plan for the inoculation and consequent death of the rabbit has the advantage of being peculiarly adapted for application in rocky fastnesses and belts of scrub, which on account of their almost inaccessible character become the happy breeding grounds of this prolific pest. It is in country of this kind where the rabbits are thickest that the victims of the disease will necessarily be both absolutely and relatively the most numerous. Of special importance is the fact that the parasite being peculiar to the rabbit is harmless to man and sheep, each of whom is already sufficiently handicapped by their own specific forms, *sarcoptes hominis* (itch) and *sarcoptes ovis* (scab) respectively. It is just possible that in parts of Australia some obscure climatic or telluric conditions may exist which would minimise its ravages, just as in Central Australia the flukey-livered ox of the Murray swamps outlives its parasites (*distoma*), which when they die undergo calcification, and, except as ordinary foreign bodies (swallowed pins, &c.), are thenceforth inert. In conclusion I would like to ask how many years it would take if we ceased to import fresh stock, and if at the same time we encouraged to the utmost the propagation of ordinary scab, before our sheep would eventually become extinct? What would become of our vineyards and potatoes were phylloxera in the one case and the potato disease in the other in like manner encouraged? What would be the fate of a human idiot affected with itch and abandoned by his fellow-creatures? What has and is still hourly taking place among our aborigines since first we unintentionally strewed the germs of consumption (*Kochs bacillus*) amongst them?

I am, Sir, &c.,

ARCHD. WATSON,

The University Adelaide, September 30.

Register June 8 1886

## THE RABBITS.

TO THE EDITOR.

Sir—It is refreshing to find that some few of your correspondents are beginning to show some symptoms of a return to sanity upon the rabbit question. Mr. E. M. Urcott, of Mannum, though still mad as a March hare generally is, is, nevertheless, not a monomaniac of quite so pronounced a type as most of your correspondents, and during lucid intervals actually pens passages that might have been written by a perfectly sane man. In his letter of May 20 he expresses himself as thoroughly opposed to any further squandering of the public money in a vain attempt to do that which is impossible, and adds:—"At all events it would be beyond the power of the Government to clear the one district; and if this could not be done where is the use of hoping to clear the entire colony? The country will never be purged by such means, and it will never be purged by the introduction of any number of ferrets, or mongoose, or other noxious animals." Near the end of his letter is the following thoroughly rational passage:—"The rabbits are a mitigated evil in themselves, for at the worst we could live on them, but this (the being mitigated, I mean) can by no means be said of many of the suggested and even attempted remedies that have been brought forward. But unfortunately, the insanity crops out in a suggestion to adopt Professor Watson's atrocious and diabolical scheme to import some disease by which all the rabbits may be exterminated. However, in a lucid interval, common sense regaining the ascendancy, he gives the very necessary caution, "Equally dangerous to human beings, horses, sheep, and cattle, such as bovine tuberculosis, shall be set going." Now, Mr. Editor, has not been said by a certain poet

And fools rush in where angels fear to tread.

Professor Watson recklessly attempted to introduce a fearful plague into this colony. Mr. Urcott says—"Accident prevented him attaining his object." It looks like a special interposition of Divine Providence to prevent an incalculable evil from being inflicted upon the Australian Colonies. What grounds has Professor Watson for assuming that the *Acarus cuniculi*, which the learned Professor will persist in calling *Sarcoptes cuniculi*, cannot spread to other animals? Are we to suppose that this parasite was created with the first rabbit placed upon this globe and has descended from rabbit to rabbit to the present time, and that it was created purposely to destroy the Creator's own work? If not, how does the learned Professor account for this small parasitical animal ever getting upon the rabbit at all? May it not also find a congenial habitat and flourish upon other animals? In fact, does Professor Watson know how the *Acarus cuniculi* gets on to the rabbit any more than Hodge, the hedger and ditcher, knows how a hydatid gets into the liver of a man or into the brain of a sheep? Can the learned Professor satisfactorily answer these questions? Professor Watson may be a very learned man. I will assume

him to be of as high standing as the late Professor Owen, who was, I believe, the first person who saw and described the *Trichina spiralis*. But this eminent scientist was not omniscient, and, as a natural result of imperfect information, arrived at the erroneous conclusion that the *Trichina spiralis* was harmless to the human race. I believe that Professor Owen first saw and described this parasite in or about the year 1834, and in 1837 the following description was given, which, though not taken directly from any lecture or writing of the Professor's, is, I believe, expressed in the discoverer's own words:—"A portion of muscle affected by these animals appears beset with whitish specks, which, if examined with a microscope, are found to be little cysts containing a minute worm coiled up. The cysts are of an elliptical shape, and attenuated towards the extremities. Their length is about one-thirtieth of an inch, and breadth one-hundredth. By cutting off one extremity of the cyst, the trichina may be extracted entire, when it is generally found rolled up in two or two and half spiral coils. Being straightened out, it will be found to measure one-thirtieth of an inch in length and one-seven-hundredth of an inch in diameter. . . . It seems that this parasitical affection of the human body is unconnected with age, sex, or any particular form of disease; and it appears that it may exist without giving rise to any debility of the vital powers, or even without interfering with the enjoyment of robust health, as has been shown in a case lately met with. "If any one had proposed to introduce the *Trichina spiralis* into New Zealand with the object of destroying the wild pigs, and Professor Owen had been consulted as to whether it could be done with safety, without doubt (though I do not for one moment imagine that he would have recommended such a thing to be done), he would at that time (1837) have replied that it would not in any way endanger the human race. A few years afterwards when of 100 people who sat down to dinner, at which one of the viands was trichinous pork, upwards of ninety were corpses within about ten days, it was very clearly seen how erroneous a view a limited knowledge of the parasite had led the Professor to entertain of its nature and powers. Now, Mr. Editor, I ask—Does Professor Watson now know more about the *Acarus cuniculi* than Professor Owen knew about the *Trichina spiralis* in 1837?

Permit me to remark *in limine* that we, the most learned of us, know very little about minute animal parasites, bacilli, and bacteria. We are, I believe, upon the threshold of important discoveries, but the discoveries have not yet been made. Dr. Koch a short time ago imagined that he had discovered the germ of cholera, bottled it, and sent it to various parts of the world for experiment, and Dr. Klein drank a tumblerful of the other doctor's bottled cholera and was none the worse for it. It behoves us in the present state of our knowledge not to play rashly with edged tools, the working of which we do not quite understand.

Let us see what we really do know about the *Acarus cuniculi*. It belongs to the class Arachnida, many of the genera of which have a peculiar power of adapting themselves to varied conditions of existence. Some appear in their natural state to be vegetable feeders, and yet can find a congenial

vegetable feeders, and yet can find a congenial habitat upon or within the tissues of animals and subsist upon the animal juices, and increase and multiply. The *Acarus saccharinus*, which I presume the learned Professor would *Sarcoptes saccharinus*, is supposed to feed upon the albumen in moist sugars, and yet it finds a congenial habitat and exists and propagates under the cuticle of the human subject, producing what is known to medical men as "grocers' itch." Other larger species and genera, undoubtedly vegetable feeders, attach themselves to horses, cows, dogs, pigs, and even men, and subsist upon the animal juices. Judging, then, from analogy, we have every reason to believe that the *Acarus cuniculi* may be able to exist upon other animals than the rabbit, and if it produces, as a secondary effect, tuberculosis in the rabbit it may do so in other animals. In what precedes I have confined myself to the low grounds of selfishness, self-interest, and self-preservation. The objections of those who take a higher stand I venture to hope will not be quite so "easily lulled to rest" as Mr. Urcott imagines. The miserable sophistry of attempting to palliate wholesale murder by calling it, with an inapt reference to King David placing the murdered creatures in the hands of God, is only to be excused upon the score of the writer at the moment when he penned the words not being quite *compos mentis*. If admitted as valid argument, the next step would be to place the natives of New Guinea and the South Sea Islands "in the hands of God" by distributing amongst them the germs of cholera, tuberculosis, trichinosis, smallpox, typhoid fever, &c., so as to clear those countries for the white man. Objectors could be told that "we were merely utilizing the means God has put at our disposal (through the discoveries of Pasteur, Koch, and others), that it was folly and sin in us to neglect this means, and that we were justly punished for our neglect by the spread" and continued existence of the black and tawny races. To man sufficient intelligence has been given to enable him in time to eliminate disease from both man and beast, and it is his bounden duty to do so, and not to disseminate diseases and spread them abroad over the world, ignorant and regardless of consequences.

Let me conclude with a few facts about rabbits. The New Zealand settlers, albeit as mad as the South Australians, have, nevertheless, a method in their madness. Although their policy, like ours, is one of extermination, while we have been expending about £100,000

a year without any return they have been exporting rabbit-skins of the declared value of about £100,000 a year; and as all property is taxed in New Zealand, and I presume that rabbit-skins in the hands of the squatter or merchant are reckoned as property, the declared value is no doubt made as low as it can be. In 1884 the declared value of skins exported was £107,514, and in 1885 nearly as much. Mr. Stuart Holmes (vide *Register*, October 20, 1885) before a Rabbit Investigation Committee in New Zealand says:—"For three years they endeavoured to get rid of the rabbits by employing men with dogs, and kept from 100 to 120 men constantly at work. Their experience was that men and dogs were the most useless and expensive means yet devised. The back boundary of the run was then fenced with wire-netting, and they commenced laying phosphorized oats. As a result 400 and 500 dead rabbits were being picked up in a day, and very shortly after that they shipped to England 300,000 rabbit-skins for one year's work, which realized up to 2s. 4d. per lb.—six winter skins to the lb., or 4d. to 6d. each." The wonder is that rabbit-skins so obtained should have been saleable at all, much more that some of the skins realized the high price of 2s. 4d. per lb. None but the best full-sized skins ought ever to be exported to England. Mr. Stuart Holmes having given the above evidence about the rabbits on the Castle Rock Run (N Z), it is astonishing that this gentleman should be so blinded by an insane prejudice against rabbits as not to see that a well-managed rabbit run with skins at 2s. 4d. per lb. would be many fold more profitable than a sheep run with wool at 6d. per lb. I presume that from a given extent of run a greater weight of rabbit-skins could annually be obtained than of sheep's wool. In Norfolk rabbits are reared upon the comparatively poor lands, but there are no lands there so poor as to be able to feed only fifteen sheep to the square mile, which is all that many of our runs are said to be able to do. The demand for furs throughout the world from the most remote times down to the present day has been continuous, but the supply has very much fallen off. From 1821, when the Hudson's Bay and North-West Fur Companies amalgamated, to about 1840 the fur trade was flourishing and the united Company prosperous. In 1839 they exported to England upwards of 23,000,000 skins of different animals, but in about twenty years the quantity fell off to about half, and, I believe, has been dwindling ever since. The demand continues fitfully in Europe, but steadily and constantly in China. England has for many years exported furs to China. About 1780 sea otter-skins were first sent. In 1835 only 520 were exported from England to that country. A Chinaman, if he cannot obtain sea otter-skins at a high price is not too stupidly proud to wear rabbit-skins at a moderate price; and, as fuel is scarce in China, the whole four hundred and sixty odd millions of that empire wear furs in the winter-time if they can possibly afford to buy them. From the beginning of the present century rabbit-skins have been exported from England to China. The wholesale dealer in London gives as much as 6s. 6d. a dozen for good skins of the silver-tipped Lincolnshire rabbit, ships them to China, lies for several months out of his money, runs the risk of damage to

the skins, pays freight, insurance, commission, &c., and of course would not do so unless the price obtained in China were such as to yield him a profit. We in Australia ought to rear the same kind of rabbit, and send the skins to China direct. While the price of wool for many years has been steadily falling the price of rabbit-skins has been, notwithstanding the increased supply, as steadily rising. The fur is now used for many purposes which were not even thought of a few years ago. A letter from England says that 40,000 rabbit-skins a week could be utilized in one factory alone if a regular supply could be obtained. The immense fecundity of the rabbit has, without doubt, been bestowed upon it by the great Creator as a blessing to the human race, and when the present mania ceases, as cease it will, and the animal is utilized, instead of being as at present wantonly destroyed at the public expense by bands of idle vagabonds who ought to be kept industriously employed in production instead of mere destruction, the so-termed "plague" will be found a source of incalculable wealth to the Australian Colonies.

I am, Sir, &c.,

A. F. LINDSAY.

June 1.

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