

POISONING OF CATTLE WITH BRITISH RAGWORT.

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IT is difficult to believe that the absence of recorded cases of poisoning by ragwort (*Senecio*) in Great Britain means that none have occurred, since the weed is widely distributed, is often found on pastures in large quantity, and may enter considerably into the hay cropped therefrom. Conditions of drought and shortage of pasture seldom occur in Great Britain to the extent of forcing animals at pasture to consume continuously considerable quantities of ragwort, but this would not account for the absence of cases after consuming the hay. It is possible, although there is little information on this subject, that British ragwort does not contain a large amount of the poisonous principles, and that this may in part account for the absence of recorded cases.

In South Africa, parts of Canada, New Zealand, and Australia, where the conditions of drought are more frequent and severe, poisoning in horses and cattle by various species of ragwort is well known under the names of Molteno, Pictou, and Winton disease. At first the trouble was looked upon as a disease enzootic in the areas after which it received some of its names. This is not surprising, having regard to the facts that the poisonous principle appears to be cumulative, that in many cases a considerable amount of the weed has to be consumed over a certain period before definite symptoms of illness appear, and that animals may not show the first definite symptoms of illness until some considerable time after the feeding on ragwort has been discontinued. The latter observation applies to more than one poisonous foodstuff upon which the writer has published observations—soya and bracken,¹ for example; and it would appear that, once certain tissues have received a toxic dose of these poisons, it is only a matter of the required time before they succumb to their action with the consequent results to the animal. It may be that this interval which elapses between the application of the cause and the appearance of the effect, and the apparent dissociation between the cause and effect arising therefrom, have led to cases of poisoning from ragwort being overlooked in Great Britain. The poisonous principles are known to be alkaloidal, but it is not proposed in this short article to go fully into the pharmacological work which has been carried out in relation to the various species of *Senecio* from different parts of the world. It will be sufficient for its purpose to mention that Cushny,² after some negative results which he explained on the

¹ This Journal, June 1916, and Report of Chief Veterinary Officer, Board of Agriculture and Fisheries, 1909 and 1910.

² "Proc. Royal Soc. B.," Vol. LXXXIV.

grounds that the plants were not flowering when collected, obtained from specimens of British ragwort (*Senecio jacobæa*) an extract which caused poisoning in small animals with symptoms of the same kind as appear in poisoning by *Senecio* plants.

In the beginning of May of this year Mr Pratt, M.R.C.V.S., of Northallerton, consulted the Veterinary Laboratory of the Board of Agriculture and Fisheries in relation to what appeared to be an outbreak of disease in a herd of cattle under his care. Mr Pratt suspected the dried forage, some of which he sent, together with organs showing lesions and a description of the symptoms and general *post-mortem* appearances. Some of the latter are described later with Mr Pratt's permission. The forage contained a considerable quantity of a dried weed rather like ragwort, and the symptoms and lesions described by Mr Pratt aroused suspicion of ragwort poisoning. The weed was sent to Kew, where it was definitely identified as *Senecio jacobæa*.

History.—The history of the outbreak was that twenty-four store cattle were put in a pasture through the winter. In the previous summer this pasture had been cut for hay, chiefly because it contained a large quantity of a tall-growing weed, which it was thought might be got rid of by this means. Owing to the severe weather in the early part of the present year the hay containing the weed was fed to these store cattle. Enquiry failed to enable an estimate to be made of the approximate amount consumed by each animal, as the forage was dumped on the pasture and the animals ate it at will. It was found, however, that the feeding began on 21st February and was continued till 17th April—fifty-five days—when the herd was removed from the pasture. There was no doubt about the weed being present in large amount in the forage, so that over the period mentioned considerable quantities must have been consumed. The first animal to show visible symptoms did so on 6th April, forty-four days after feeding commenced. This animal died in twenty-four hours from the first appearance of symptoms. A second beast was visibly ill about the 20th April, and died on 23rd April. On 30th April, fifty-eight days from the commencement of feeding, two others were ill, one of which died on 1st May. On 1st May three others were showing signs of illness.

Between 16th April and 11th May eight beasts had died, five others were showing visible signs of illness, and a few others were under suspicion. One of the five died on 16th May, sixty-eight days from the commencement of feeding and twenty-eight days after the feeding was discontinued. These animals died at intervals of from one to eleven days after the first appearance of symptoms.

By the 24th May thirteen animals had died, two had been ailing for three weeks, and one other for a fortnight and looked like dying. No animal had recovered after showing visible symptoms.

It will be observed that some of the animals which died did not begin to show visible signs of illness for some time—up to three weeks—after feeding on ragwort had been discontinued, and it would appear that, even after a toxic amount of the material has been consumed, a certain amount of time is necessary to produce

the action which gives rise to the visible symptoms. It is therefore not always safe to conclude that animals which have eaten the weed have escaped poisoning simply because the feeding has been stopped for some time and no signs of illness are apparent.

Symptoms.—The symptoms observed in the more acute cases, presumably those which had eaten more freely of the weed, were unthriftiness, absence of control over movements (staggering gait), impaired vision, and nervous excitement, which in some cases amounted to frenzy dangerous to the attendants. The pulse was frequent and weak. Some animals showed diarrhoea, but most of them suffered from severe constipation accompanied by violent straining.

Post-mortem Appearances.—The lungs were congested. The intestines showed severe muco-enteritis, and small hæmorrhages were also present under the mucous membrane. The omentum was thickened by serous effusion, and in the case of one animal, which died sixty-eight days after the commencement of feeding on ragwort and twenty-eight days after it was discontinued, the abdominal cavity contained a considerable amount of fluid. This probably was secondary to the lesions of the liver. The pericardium showed small hæmorrhages in its substance. The livers were enlarged, and firmer than normal; they were also yellow in colour. In the case of the previously mentioned animal the liver was universally enlarged and of fibrous consistence. It cut toughly, and the cut surface showed fine fibrous strands. A histological examination revealed a fine cirrhosis throughout the organ. The fibrous tissue formation followed the course of the vessels into the lobules. Most of the liver cells which had not been replaced by fibrous tissue were fatty.

The symptoms and lesions described above correspond closely with those which were observed in Pictou, Winton, and Molteno disease.

Prevention.—Curative treatment is complicated by the fact that the poison appears to have established its action before the animals show signs of serious illness. No curative agent is known. The only remedy is prevention, and this resolves itself into removing the weed from forage containing it, or eradicating it from the pastures.

The *Journal of the Department of Agriculture and Technical Instruction for Ireland* (April 1916) contains an article on the Bionomics of Ragwort, by M'Govern. This author shows that, contrary to the usually expressed opinions, ragwort is not perennial but biennial, and propagates by seeds alone.

The following summary in relation to measures for eradicating the weed from pastures is quoted from the article in question:—

“Ragwort may be exterminated by preventing the plant from seeding. This may be done in the following ways:—

“(a) By grazing infested land with sheep in the winter and early spring.

“(b) By cutting the plants in the flowering stage, either (i) twice, the first cut being made early in July, and the second about six weeks later, there being no necessity to gather up the cut portions; or (ii) once only, cutting being done late in July or early in August.

The cut portions of the plants must be gathered up at once and be destroyed by burning.

"(c) By pulling the plants if circumstances permit, preferably early in July, when there is no need to collect and burn the pulled plants. If pulled later the plants must be collected and burned to prevent seeding.

"It is most important to remember that since ragwort is a biennial plant it is absolutely necessary on pasture land to carry out cutting or pulling during two successive seasons.

"It is clear that in addition to the two-year-old flowering individuals present in a given summer there must also be a crop of one-year-old plants still in the rosette stage which will produce their flowering stalks during the second summer.

"Further, since it is practically certain that the seeds of ragwort, like those of charlock, poppy, and some other plants, may lie buried in the soil (although still retaining their vitality) for some time, it must be remembered that any farming operations which may bring these seeds to the surface will result in their germination, and a crop of ragwort derived from such seed is not an infrequent occurrence on land newly laid down in grass.

"Finally, owing to the ease with which the seed of ragwort is distributed by the wind the re-seeding of land temporarily cleared of it is an easy matter when the plant is allowed to flourish and produce its seeds on neighbouring land. There is, therefore, the strongest reason for scheduling this plant as a noxious weed all over the country, and for throwing the responsibility for its eradication on the shoulders of all those who possess or occupy land."

The method mentioned under (a) seems to call for further remark. It seems to be assumed, and it is a fairly general belief, that sheep are immune to poisoning by ragwort. It should be noted, however, that sheep are put to graze ragwort for the purpose of destroying it in the winter and early spring, that is to say, before the flowering season, when it is most poisonous, and it does not follow from this alone that sheep may not be poisoned by British ragwort in its later and flowering stages. The effect on sheep of ragwort in its flowering stages is now under investigation.

RICKETS IN DONKEYS.

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THE two accompanying photographs show a condition which is prevalent among donkeys and sheep in the Northern Transkeian Territories. The peculiar feature of the disease appears to be that it does not affect horses and cattle, although it is extremely common among donkeys.