

ART. X.—ON THE WINTER FOOD OF THE PARTRIDGE AND ON PARTRIDGE POISONING. By J. SOMERS, M. D., F. R. M. S.,  
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THE "Partridge," so-called, (*Bonassa umbellus*) or ruffled grouse, is like its congeners, *Omnivorous*, its food range being what we may term a wide one, embracing, as it does, the products both of the animal and vegetable kingdoms.

In the spring and summer its food consists of insects—*ova larva* or perfected, of molluscs, principally *pulmonata* (snails), and a wee-toad or frog does not come amiss. From the vegetable kingdom various seeds and wholesome berries, in the early autumn the blueberry and huckleberry, *vaccinieii*, constitute a staple article of its food; later on the bird subsists principally upon beech mast, and during the months of October and November the crops of partridges secured by sportsmen and others rarely contain any other food. As we advance towards winter the diet of the partridge becomes more and more restricted, and when the season is well established, and heavy falls of snow cover the ground in woods and open, then our partridge is constrained to banquet upon food material that is most within its physiological requirements and nearest to its reach.

At this season the crop of this bird will be found to contain broken catkins of the birch, "*Betula excelsa*," broken fronds of shield fern, "*Aspidium spinulosum*," and leaves and berries of sheep laurel, "*Kalmia angustifolia*," the proportionate quantities being about nine-tenths of birch catkins and one-tenth fern fronds and kalmia leaves, the proportion of the latter, however, always exceeding that of the fern, as you may observe by examining the three partridge crops presented to you; you will notice that the fern fronds are beautifully fresh and green. Having been scratched by the birds from beneath the snow, which preserves them in this condition all through the winter, there is little room for doubt in regard to the reason why the birds seek for and partake of these fern fronds; for though they

contain little nutritive matter, they are yet always succulent and tender, and supply them with the only green food which they can procure during our subarctic winter. The kalmia leaves, you will observe, are sear and coriaceous, just as we find them persisting on the plant during autumn and winter.

The birch catkins contain the male flowers of this tree locked up in their winter sleep. They yield, on analysis, both carbonaceous and nitrogenous matter, and supply, though in limited quantity, matters requisite to the nutritive demands of the tissues of our Partridge: but, as they contain, also, a large quantity of insoluble and unassimilable matter, their digestion requires to be slowed, so that the soluble and assimilable matter may be separated and prepared for absorption into the blood. The firm fronds contain a small quantity of starch and mannite, with a percentage of nitrogenized matter; they are probably of most service supplying to the tissues certain inorganic proximate principles which are necessary to their well-being. Salts of soda, potassia and lime abound in ferns. These substances are as much food requisites as those of organic origin.

In birds the nutritive processes and circulation are more rapid than in mammals, their great muscular activity induces rapid tissue change; they, therefore, require a large amount of food. Hence birds are constant feeders. In them, too, the digestive process is quick in action, and a diminution in their food supply is severely felt and soon shows its effects,—they emaciate, lose their activity, and become slow and torpid.

It is well known that birds, considering the size and weight of their brains, are uncommonly intelligent. This applies particularly to the class of birds under consideration, which become proverbially shy and cautious in localities where they are much sought for by sportsmen; in seasons when food is scarce they very often, owing to their diminished activity, become an easy prey to the gun.

In endeavoring to account for the eating of the kalmia leaves by the Partridge, and the innocuousness of this plant to the bird itself, we may premise that it is taken, not for its nutritive value, but because it acts indirectly by preventing tissue change.

It is taken instinctively, no doubt, though not in sufficient quantity to injure it. *Kalmia* is a narcotic and arterial sedative and contains a large proportion of tannin, it slows the circulation and retards the passage of the food through the alimentary canal. The active narcotic principle in this plant possesses properties similar to those of alcohol, opium, quinia, &c., viz., to lessen tissue change, and thus, in a certain way compensates for a deficiency in the quantity of food.

It may be said that the foregoing ideas are more or less theoretical, but observations into the life history of our Partridge show that in the winter season when there is much snow the food of our bird consists largely of matter, not highly nutritive amongst them and some not usually taken at an earlier part of the season. In the winter they are usually sluggish, and are easily approached by the sportsman. At this time, also, certain portions or the whole of the flesh is often poisonous, producing when eaten symptoms like those that would be caused by the action of a strong arterial sedative, as a subsequent portion of the paper will show.

Hunters' stories are not always credible, yet there is one very common over the Northern portion of our Continent wherever the Partridge abounds, whose universality might answer for its truthfulness. This story refers to the extreme stupidity exhibited by the behaviour of the Partridge at times. It is well known to be shy in early season, but in winter and after heavy snow-falls a covey may be captured when roosting, provided the hunter begins with the birds on the lowest branches.

We could well believe this story if the birds were short of food and under the influence of *kalmia*, the narcotic action of the plant being well calculated to produce that torpor and want of alertness which is said to characterize the Partridge during the season of snow. This leads up to the second part of my paper, viz., Partridge Poisoning, so-called. I have recently, in my own person, experienced the effects of eating poisoned Partridge, and may mention here that the circumstances and symptoms of my case, which I am about presenting, destroy most effectually the idea that Partridge poisoning is due to idiosyncrasy, or to putri-

factive changes in the flesh of the bird. These, on the contrary, show that the poisonous property is due to an external cause which, when present, gives always equal results, but when absent there is, as a matter of course, no such results.

The Partridges were four in number,—three were Birch Partridges, *Bonassa*, and one a Spruce Partridge, *Tetrao canadensis*. The crops and gizzards are here before you for examination. The crop of the Spruce Partridge contains leaves of *Abies balsamea* only, the others contain birch catkins, *Betula excelsa*, broken fern fronds, *Aspidium spinulosum*, and leaves of *Kalmia angustifolia*. Nos. 1 and 3 were shot shortly after feeding, as their full crops and empty gizzards testify. No. 3 had the gizzard full, and was, as the specimen shows, in full digestion. This was a fine plump bird, and could be easily selected from the others after they had been all cooked. I beg to direct your particular attention to the gizzard of this bird, the contents of which, at this time (five weeks from when it was opened), develop freely that odour and taste which we call the Partridge flavour. I supposed if there was ever a poisonous Partridge, this must be the one. My surmise proved correct, as the sequel will show. At dinner I partook of this bird, using the black meat and strongly flavored parts, the other members of my family, of which three were children respectively two, five and ten years of age, partook of the white meat of this and of the second birch partridge, none of them experiencing any unpleasant sensations therefrom.

In my own case no results followed partaking of the partridge until about an hour afterwards. I had, in the meantime, gone out, had attended to some business matters, but while doing so became aware that the poison was about to take effect. My first feeling was one of fullness in the brain. A well marked sense of numbness around the mouth and lips and in the fauces. I thereupon returned home, attempted to smoke some tobacco from a pipe but this occasioned nausea, and I was forced to desist. While standing up to set the pipe aside, I was seized with dizziness and inability to maintain the erect position, and would have fallen on the floor of the room had I not supported myself by

resting upon a table near at hand, then, by making a strong effort I was able to cross the room to a lounge. On taking the recumbent position, the feeling of dizziness subsided, but the nausea increased until it terminated in copious and prolonged emesis which continued with short intermissions for upwards of an hour. No pain accompanied the emesis which terminated when the stomach was emptied. Accompanying the vomiting there was pain in the back at the root of the neck and between the shoulders, *i. e.* at lower cervical and upper dorsal vertebræ. This was a peculiar kind of pain of a dull aching character, very much like that which follows over-exertion of the muscles. This feeling passed down both arms, but changed from that of pain to one of numbness and tingling most marked along the track of the ulnar nerves, and terminating in the fingers; there existed also a feeling of coldness well marked in both extremities, and felt—though not in the same degree over the whole body—the sensation as if a current of cold air was directed upon the naked surface; the skin was colorless, the face had a ghastly look, perspiration not increased but rather diminished, urine not increased in quantity, no action of the bowels, pupils normal and the intellect not disturbed.

The most marked action of the poison was upon the circulatory system, as the following observations will prove, the action of the heart being slowed, as evidenced by the fall of the pulse.

I should here explain that I am forty years of age, my height five feet nine inches, weight about one hundred and seventy-two pounds avoirdupois, in good health, regular habits, well nourished, normal, pulse about seventy-six beats, respiration to correspond. The first examination of the pulse was made after the first emesis, the time being fifteen minutes past three, p. m., the count gave forty-six beats to the minute. At fifteen minutes to four, p.m.—that is half an hour after the first examination—it had fallen to forty-three beats per minute, the respiration being correspondingly diminished in number. The pulse remained at this figure (43) for about two hours. The emesis continued at longer intervals, being finally overcome by taking small doses of brandy. After six, p.m. no matter was ejected from the stomach. The pulse

then began to rise, increasing also in volume, being forty-five at six, p. m. Increasing gradually from that time until seven, p. m., when it counted fifty-eight. The temperature of the surface began to increase with the pulse, and feeling now comparatively recovered from the effects of the poison. I got up and made an attempt to go to the supper table, but was immediately seized with giddiness, and fell on the floor in a state of insensibility, which lasted for a few seconds only, for as soon as I gained the recumbent position the condition passed off almost as speedily as it had occurred, and before assistance could be rendered I was able to help myself to the place I had previously occupied. I then remained in the incumbent position for over an hour, partook of some tea. Was shortly after able to go down stairs to examine and prescribe medicine for a patient who called to consult me, and experienced no unpleasant sensation, except a feeling of languor, some trembling of the muscles, and chillness of the whole body. When I retired to be bed at eleven, p. m., the pulse registered sixty-eight. I slept well. It was not until twenty-four hours afterwards that the pulse resumed its normal beat, and it took three or four days for the system to recover its usual tone.

Partridge poisoning in the human subject has been variously ascribed to idiosyncrasy or individual susceptibility to poisonous properties developed by putrefaction or to intaking of food which innocuous to the bird, yet causes its flesh to assume poisonous properties. Taking my own experience as an example I think we can eliminate the two first causes assigned—the first, idiosyncrasy, I can lay no claim to. The Partridge is a game bird for which I entertain a great partiality, and use it frequently when in season. I have eaten the flesh of the bird as freely since as before my poisoning without evil results. In fact up to that time one year ago I had come to believe I was proof against Partridge poisoning, and had some belief in the first theory of causation, knowing that the condition was not of infrequent occurrence in many persons who had eaten this bird. I partook of the black meat and the strong flavored internal parts of my partridge, or the parts that, owing to the presence there of absorbents and the thoracic duct, would contain matters passing from

the digestive organs to the blood vessels. The breast of this bird and flesh of other two were eaten by the rest of the household without unpleasant results. I can, however, understand that the whole of this bird would have become poisonous in time. It was killed shortly after feeding, and the poison had not had time to diffuse itself. This will account for the immunity of those who had eaten of the white meat only. The putrefaction theory is out of court also. The bird was quite fresh, as the gizzard and parts before you testifies. More than this, a man in health with good digestion can dispose of flesh in a state of putrefaction with perfect ease. The third then is the only causation to which we can attribute the development of poisonous properties in the flesh of the Partridge at certain times of the year, and I think the facts stated above are sufficient to convince any reasonable person of the correctness of this view, the symptoms exhibited prove the poison to belong to the class of arterial sedatives—said sometimes to be narcotics. The more powerful of the class are not narcotic in the true acceptance of the term. "There was no tendency to sleep in my case." Their action is to depress the circulation by slowing the movements of the heart acting no doubt, through the peneumo-gastric nerves and probably also upon the great splanchnic nerves; there is also arterial contraction and diminished blood in the capillaries, hence the bloodless skin, vomiting, vertigo and loss of consciousness experienced in this case.

An extract from a memoir of Dr. Stabler in Griffith's Medical Botany, p. 429 says, a large dose of a strong decoction of *Kalmia latifolia* caused in half an hour vertigo, dimness of sight, great depression of the heart's action and cold extremities, without, however, producing any disorder of the mental faculties. It is said in the same work, on the authority of Dr. B. S. Barton, the American Indians used the plant for suicidal purposes. The symptoms of *Kalmia* poisoning given by Stabler coincide so closely with those of Partridge poisoning we are safe in assuming that they are due to one and the same poison. It is also conceded from a therapeutical point of view that *Kalmia Angustifolia* is more active than *K. Latifolia*, the former plant being the one found in the stomachs of our Partridges during the winter season.