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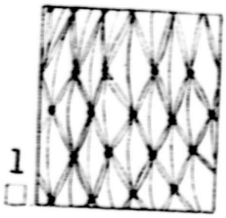

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THE OTTAWA NATURALIST

VOL. XXIX. NOVEMBER, 1915 No. 8

A NEW ORDOVICIAN PELECYPOD FROM THE OTTAWA DISTRICT.*

By Alice E. Wilson.

The shell is of medium size and subelliptical in outline, length and height about as 2:5. The valves are very slightly convex. The cardinal margin is straight posterior to the beaks for about two-thirds the length of the shell, making an angle of 45° with the anterior margin, which continues as a straight line nearly to the median transverse axis of the shell, thence curving into the anterior and basal margins. The latter margin bends slightly upward opposite the broad weakly-defined sinus. The posterior end is slightly truncated obliquely, but joins the basal margin with a moderately narrow curve. The anterior margin and the straight cardinal margin form a more obtuse angle than that of the posterior end, and the curve with which it joins the ventral margin is less narrow. There is a slight constriction beneath the very moderately raised umbones. The lunule, which is evidently very narrow, is partially destroyed on the specimen examined. The sinus is very shallow, moderately broad and less oblique than most other species of this genus. The umbonal ridges are not prominent, and become imperceptible in the posterior portion of the shell, which is almost flat. Anterior to the sinus there is a slight inflatation. The concentric growth lines are very fine, but anteriorly they are gathered into about a dozen strong ridges, which end abruptly in the oblique cardinal margin. Posteriorly the ridges of growth lines almost disappear.

The most striking characteristic of the species, however, is the unique marking. A series of fine granules crosses the concentric growth lines, radiating from the umbonal region. Near the beak they are very fine, hardly visible to the naked eye, but they become much stronger away from it, so that in the ventral half of the shell they have almost obliterated the concentric growth lines, except anteriorly where the strong ridges of concentric growth lines are still prominent. On the dorsal half of the posterior portion of the shell there is a still more complex marking. In addition to the very fine concentric growth lines crossed by the radiating series of granules, which here are very minute, there is a very fine double network of lines running obliquely from granule to granule, forming a regular mesh, with

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one granule at each intersection of the lines. The lines of growth, with a gentle curve towards the posterior margin, pass from apex to apex across the longest diameter of the mesh. Some of this very fine network is worn, and in places the granules appear to be shoved up together, but there is much of it that is remarkably well preserved.

The length of the right valve, which is the only specimen found, is 53 mm., height 21 mm.

This species closely resembles *Rhytimya ochana* Ulrich, but differs from it in the straight anterior cardinal margin in the narrower and less oblique sinus, with its consequent less sinuate ventral margin, in its narrow and more rounded posterior portion.

It differs from *Rhytimya compressa* Ulrich, in the more abrupt downward slope of the anterior portion of the dorsal margin, in the somewhat more distinct mesial sinus, and the corresponding slight upward flexure of the ventral margin. *Rhytimya granulosa* is larger, the posterior portion is more prolonged, and the mesial sinus is less oblique.

Compared with *Rhytimya convexa* Ulrich, this species is less convex on the whole, although slightly more inflated anterior to the mesial sinus. The folds of concentric growth lines are less prominent posteriorly and the cardinal margin is straighter.

For this species I would propose the name *Rhytimya granulosa*.

The Museum is indebted to Mr. G. S. Blake, geologist of the Standard Oil Company of Canada, for the shell.

Formation: Lorraine, in the Proetus zone, several hundred feet below the *Strophomena fluctuosa* horizon, which is regarded as near the base of the Waynesville division of the Richmond, by Aug. F. Foerste.

Locality: Twelve miles east of Ottawa, near Vars, on the Grand Trunk railroad. Immediately west of the intersection of the roads between concessions VII and VIII, between lots 20 and 21, nearly two miles west of Vars.

EXPLANATION OF PLATE II.

RHYTIMYA GRANULOSA, N. SP.

1. Portion of network on the upper posterior portion of *Rhytimya granulosa* x ten diameters. The lines of nodes from right to left are the radiating lines shown on the specimen. The single long lines through the long axis of the mesh are the lines of growth.
2. *Rhytimya granulosa*, photograph of type x 1½. Number 4319 in the Geological Survey Museum.

SHALLOW WATER DEPOSITION IN THE CAMBRIAN OF THE CANADIAN CORDILLERA.*

BY LANCASTER D. BURLING.

During the field season of 1915, the writer was engaged in a stratigraphic study of the Cambrian rocks along the Canadian Pacific and Grand Trunk Pacific railways in British Columbia and Alberta. One of the most striking features observed was the very considerable evidence of shallow water conditions of deposition in the limestones of the region.

The Stephen formation (*a*) occupies a central position in the Middle Cambrian and forms a two or three hundred foot shelf between cliffs of massive limestone each a thousand feet or more in thickness. In the vicinity of Mounts Stephen and Field, on the Canadian Pacific Railway, it includes those striking Middle Cambrian faunal horizons to which the terms Ogygopsis shale and Burgess shale have been applied. Here the limestones and shales of which it is composed betray no evidence of shallow water conditions of deposition; in fact it is hard to see how the jelly fish, sea cucumber, sponge, worm, crab, and pteropod fauna of the Burgess shale (*b*) could have been preserved in strata deposited outside of the most sheltered of habitats. In Castle Mountain, 30 miles southeast of the locality to which these faunas appear to be confined, however, the limestones of the Stephen formation, which are both coarse and fine grained and apparently purely calcareous, are very largely mud-cracked and ripple-marked. The areas outlined by these mud-cracks vary from one inch to three or four feet in diameter, and the distance between crests of the ripple-marks varies from one inch to two or more feet, some of the larger ripple-marks being impressed upon layers carrying limestone conglomerate pebbles two inches or more in diameter. Nearly all of these limestones carry an abundant trilobite and brachiopod fauna. Pure limestones carrying what we have been accustomed to regard as marine faunas thus bear unimpeachable evidence that they have not only been deposited under shallow water conditions, but that in many cases they have suffered prolonged exposure to the air. *Glottidia*, *Kraussina*, *Terebratulina*, *Lingula* and *Discina*, among recent brachiopods, are known (*c*) to live at or above low tide, and there is no reason

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(*a*) Walcott, 1908, Smithsonian Misc. Coll., vol. 53, No. 5, pp. 209-212.
(*b*) Walcott, Smithsonian Misc. Coll., vol. 57, 1910-1912.
(*c*) Davidson, British Fossil Brachiopoda, vol. 5, 1883, p. 357.

why the extinct trilobite should have needed a deep water habitat. In fact, specimens in our collections show this form to be present upon the surface of interformational conglomerate layers—those curious bands which owe their origin to the edgewise packing and cementing of broken bits of sun-dried crust upon a tidal flat—a characteristically shallow water phenomenon exhibited by limestone strata scores and hundreds of feet in thickness throughout large areas of the Cambrian in Wyoming, British Columbia, Alberta, and Yukon. It may be of interest to record here also the fact that brachiopods and trilobites have been discovered in a massive Cambrian limestone composed almost entirely of Cryptozoon-like algal masses approximating a foot in diameter and six to eight feet in length. The gradually accumulating weight of evidence is thus strongly in favour of the conclusion that neither marine faunas nor limestones are, either of themselves or jointly, a criterion of deep water deposition, and that for much of the Cambrian the postulation of deep sea basins is unnecessary. Moreover, we have shown this to be true for at least part of a horizon whose faunas preserve their individuality through the one thousand or more miles separating the Nevada localities from those in British Columbia and Alberta.(*d*)

Evidence of shallow water conditions in the Cambrian is most striking, however, nearly 3,000 feet above the Stephen formation at the line separating the Middle from the Upper Cambrian. The base of the Bosworth formation (*e*) in the Canadian Pacific Railway section and the base of the Lynx formation (*f*) in the Grand Trunk Pacific section comprise several hundred feet of red and yellow shales which are covered with mud-cracks, ripple-marks, and casts of salt crystals two inches or more in diameter. The emergence of the sea bottom indicated by these occurences must have been prolonged, but the quiet limestone forming conditions which immediately preceded them soon followed. The occurence is of special interest, because the correctness of the division of geologic time into major units is believed to be confirmed when those units are discovered to represent periods of deposition separated by emergences of the sea bottom.

(*d*) Geol. Survey Canada, Museum Bull. No. 2, 1914, p. 113.
(*e*) Walcott, Smithsonian Misc. Coll., vol. 53, No. 5, 1908, pp. 205-208.
(*f*) Idem, vol. 57, No. 12, 1913, p. 337.

NOTES ON THE HERRING GULL (LARUS ARGENTATUS).

BY M. Y. WILLIAMS, OTTAWA.

Between June 8th and October 26th the writer cruised by launch from Wiarton to Sault Ste. Marie, visiting nearly all the islands included in the Manitoulin group. Throughout the season herring gulls were very numerous. On and after July 21st the immature birds, in brown-gray plumage, began to appear.

These gulls are reported to nest freely on Half Moon Island, where the fishermen obtain plenty of eggs for eating. On July 21st, when we visited Wall Island, I saw old nests, and also a dead, half-grown gull. What appeared to be the remains of a nest was also observed on James Island, and many gulls made it a resting place. This species is also reported to nest on some of the islands in the north channel.

A number of well-informed fishermen and hunters report that the herring gull destroys whole families of young wild ducks. Following the flock as it swims in open water, they hover over the little ducks, which try to escape by diving, and swallow them as soon as they come to the surface.

On September 27th the writer saw a small flock of what appeared to be hooded merganzers off the west end of Barrie Island. Several herring gulls hovered near and dropped to the surface of the water alongside the ducks as soon as they rose to the surface, swam up and appeared to take something away from them. On October 1st a large flock of American merganzers were fishing along the Lake Woolsey side of Indian Point. In spite of a fresh wind blowing on shore, they fished close to shore in the shallow water, following up the innumerable minnows which were to be found at this locality. A number of herring gulls mingled with the ducks, and paid close attention to them as they rose from beneath the water. I shot two of the ducks, and found their mouths overflowing with minnows.

Mr. J. Merrylees, of Gore Bay, hunter and taxidermist, says that the gulls regularly rob the ducks of their fish when they rise to swallow their catch. This appears to be the only conclusion to be drawn from the above observations. It was further stated by Mr. E. Gaulin, of Meldrum Bay, that the gulls rob the loons as well as the ducks.

From evidences seen this summer, the herring gull has at least one dangerous natural enemy. On July 10th the writer discovered four duck hawks along the cliffs of the north side of

Echo Island, which lies but three or four miles north of the Bruce peninsula. The two young birds, which were fully developed, were secured. One was shot from a dead stub at the top of the cliff, which was a much frequented roosting place. Just below were the feathers of blue-jays and the wing primaries of a herring gull. Yeo Island, which was visited July 13th, was also frequented by duck hawks, and numerous wings of crows, gulls and blue-jays lay scattered along the top of the cliffs.

THE EVOLUTION OF THE SHEEP.

By B. C. TILLETT, HAMILTON, ONT.

To the curious and enquiring mind which first strikes the question, viz: "What are the origins of the domesticated animals and plants of mankind?" there opens out a world of interesting investigation. How did man come to subdue the wild animals of the earth to his uses for labour, for hunting, and for food, and even for fancy and amusement? How came he to discover and cultivate the leaves, roots, seeds, and even the flowers of the vegetable world for food, as well as for ornament and artistic gratification? And, what is more wonderful, how did he multiply and develop from single common stocks all their innumerable and diverse varities? The last question has become, in its biological aspects, a problem so profound and interesting as to develop a new school of inquirers in Europe—the Mendelians.

THE IMPERMANENCE OF FORM.

Charles Darwin threw a powerful and important light upon these problems when he demonstrated and developed the simple yet remarkable fact of life, that all living forms existing around us have in reality no fixed permanence. They have all inherent in their nature a vital flexibility of tissue, of anatomy, and of function. And it is this which causes them to fluctuate and vary from those qualities which, in their sum total, go to the make-up of that distinctive type of life we term the species. When the world was young, and reptilian monsters dominated the tropical forests and swamps of the earth, the birds of that period showed their affinities with these creatures in the possession of teeth. The teeth have disappeared, but the population of the air remains. While no living bird now possesses true teeth, within the jaws of an unhatched parrot there are certain

microscopic points capped with enamel, which indicate its ancestral connections. They are absorbed before the bird is many days old. In the unborn parrot is the vanishing point of a "missing link" with its primeval progenitors.

With the disappearance of the primeval swamp has also disappeared the five-toed ancestor of the horse. Transferred to the plains, he now races free upon a single digit, developed into a hardened hoof, leaving the vanishing remains of other digits within his pastern to mark the transition of slow development, through æons of time, from one form of life to another. These are instances of a plastic power within the living organism which enables it to fit itself in, and adapt itself to, the exigencies of its environments. The very urgencies of subsistence, and the necessities of survival at Nature's table, demand this constitutional tendency to impermanence of form or function.

VARIABILITY OF NATURE AND LIFE.

For in all her physical aspects, Nature is herself changeable and inconstant. The rigors of her chequered and ever-changeable conditions have aided in eliciting and fixing the quality of mutability in her life forms. There is thus an element of mutability and reciprocation between the internal organism and its external surroundings. And the instability of the organism is a natural and a necessary part of the dual state of its existence. As Herbert Spencer has sententiously remarked in defining life itself, it is "a continuous adjustment of internal relations with external relations." Such, in brief, is the doctrine of variation, which is the starting point of Darwin's theory of the origin of species and the evolution of life.

Darwin at once seized hold of the enormous range of variation seen in domestic species, and its power of diversity and extension under the hand of the expert breeder and cultivator. And in utilising its multifarious phenomena in support of his thesis, he personally experimented with both animal and vegetable species. Here he showed that the key of man's power over species lies in the accumulation of his selections of varying and variable points of structure and character. Nature provides variations, and their succession in heredity. Man adds them up in directions useful to him. In this way he has built up great and serviceable breeds. He can not merely modify the character of his types, but he can change them altogether. It does not require a great effort of the imagination to determine the motives of man in his selection and improvements of breeds to serve his ends. It is known that sheep skins were used for tents, as well as for clothing and foot-wear, from the

earliest nomadic times. Size would, therefore, be a desideratum. Warmth and comfort would be desired. Length and fineness of fleece would, therefore, be sought for. Purity of colour would be appreciated. White, and its pure and uniform tints, would be desired. Principles of economy would dictate considerations as to weight, strength, and healthiness of skin and so forth.

THE FIRST EXPERIMENT.

Early in the history of the world it can be well imagined that wealth was measured by sheep. And the dignity of shepherding and the peace of pastoral pursuits bulk largely in ancient literature. The flocks of Abraham and Lot, as the measure of their prosperity, are said to have been more than the land could support. They were the chief resources as well as the spoils of the whole history and the wars of the Israelites. Solomon dedicated 120,000 sheep to the purposes of religion and the temple. Pliny remarks that sheep were used as sacrifices to the gods, as well as for food and clothing. The enormous superfluity of the flocks of ancient times must have been the product of careful selection; and it will be remembered that the first successful experiment for the production of a new colour was made by Jacob, as recorded in the Scriptures. He peeled rods of poplar, hazel and chestnut, so as to give them a "ring-streaked" or dark and white appearance. These he placed in the water troughs of the flocks. In this he supposed according to the world-old tradition that the speckled appearance would be reproduced in the young lambs through the impressionable character of the ewes carrying young. White troughs have since been used, and even white cloths have been hung up in the fields for the same purpose.

WILD AND DOMESTIC ANIMALS.

The original stock of domestic sheep is represented by, and more or less obscurely traceable to, less than a dozen wild species. These vary in outward appearance and character, considerably from the goat-like, furry rather than fleecy, blue sheep of Tibet, to the Moufflon or Armenian wild sheep of Europe. The latter is said to be the original progenitor of our domestic varieties. They formerly existed in the islands of Sardinia and Corsica in large numbers, and were the object of large organized hunts, as many as 500 being shot in a single drive. To-day they are not so numerous, and the captured are much less. Their affinity with domestic sheep is seen in the fact that now and then the wild Moufflon will forsake the wilds and mix with the homestead sheep, while it is also known that orphan lambs of the home-

stead have found a dam amongst the wild species. The variability of the domestic sheep of the world is more marked. The Africander fat-tailed sheep carries a tail which is frequently found to weigh 50 pounds, trails on the ground, and is supported by the breeder with a contrivance on little wheels. It is regarded as a delicacy, and is an important item in the mutton. On the other hand, there is a breed of sheep in Central Asia with a mere rudimentary tail, the fat natural to this part having accumulated on each side of the haunches in large protuberances as if like the camel's hump they were nature's store against future famine, which man takes advantage of and breeds out. Darwin notices the Angola variety of the long-tailed race which has similarly curious growths of humpy fat in the region of the head. The multiplicity of varieties of the sheep and their extremes of peculiarity render the veriest reference to specially interesting features out of the question in these notes. There are in the museums of the world collections of mediaeval, modern, and wild stocks, and in some of the European zoological collections a few living specimens. In the museums may also be seen fossilized remains which carry us back to the very early geological times in the earth's history. Although the ancestry of the horse may be definitely traced to the most ancient primeval epochs, that of the sheep still remains in obscurity. But it is known that this important domestic animal appeared wild in the tertiary epoch in company with the horse, camel, ox, hog and elephant. This takes us back to about 2,500,000 years ago. And according to authorities on the subject, there is ample evidence that in the quartermary epoch of the earth's geological age man had acquired some of the arts of agriculture. He had domesticated the docile sheep, and afterwards the ox, the cat, the dog, and the fowl. He had learned to dress hides, and had accomplished primitive methods of weaving. And this period is fixed as variously approximating 500,000 years ago.

BEQUEST TO O.F.N.C.

The Ottawa Field-Naturalists' Club is pleased to acknowledge a bequest of $100 by the will of the late John Charles Kearns. The late Mr. Kearns was a member of the Club for many years, and always took a very keen interest in its work.

The Council, at a recent meeting, decided to set this bequest aside as an endowment fund, the interest from which could be offered as an annual prize bearing the name of the donor.

G. LEL.

SOME HABITS OF SWAINSON'S HAWK IN MANITOBA.

BY NORMAN CRIDDLE, TREESBANK, MAN.

Swainson's Hawk (*Buteo Swainsoni*), is essentially a bird of open woodlands or hilly country. It prefers a mixture of the two for nesting purposes, and the open gopher-infested plains for a hunting ground. Reaching us rather later in the spring than most of our other hawks, it almost immedietaly sets about selecting a nesting site, the place chosen being usually either a scrub oak or an isolated aspen poplar. Occasionally, however, the birds abandon their usual practice and select a hill instead of a tree for nesting purposes, even when trees are available. On the plains farther west they do not have so much choice in the matter, and in consequence they are obliged, if they nest at all in such places, to be contented with a hill or river bank.

As I have previously pointed out, on several occasions, there are few more useful hawks, in our Canadian west, than this species. Years ago, in his "Birds of Manitoba," Thompson Seton suggested the name gopher hawk for this bird, and I know of no more fitting title. This does not suggest, however, that these birds live only on such animals. Those of us who know them well are aware that they are by no means partial in this choice. Young grouse, meadowlarks and other birds certainly form a portion of their diet, as do also, occasionally, young poultry. But observation also teaches us that at least 80 per cent of the food is made up of noxious rodents, and that is surely an excellent showing, well entitling the bird to protection.

In former times these handsome dashing hawks frequented the plains in considerable numbers, seeking and obtaining an easy living among the gopher population. As time went on, however, the persecution they were subjected to by farmers and others greatly thinned their ranks, so that to-day they are restricted to a few isolated or unsettled districts, where they are permitted to rear their young in comparative safety. I am pleased to say that one such district occurs in the neighbourhood of my home, it being situated on one of the Dominion timber reserves. It is there that I have been privileged to watch the birds for a number of years past, and have gleaned some interesting information relating to their habits and life history. Some of this information I have already related in a previous volume of THE OTTAWA NATURALIST. I shall here, therefore, chiefly confine myself to some observations made last summer, while I was out on some of my usual Sunday afternoon rambles.

My first excursion into the "Sand Hills," where the hawks reside, was in early June, when in company with two of my brothers, I was fortunate enough to run across three nests. The first of these, which I shall call No. 1, was situated in a dwarf oak (*Quercus macrocarpa*), the tree being some 14 feet in height, and the nest about 8 feet from the ground in its bushy limbs. In the nest were five eggs of the usual blotched type, and sitting upon them was a bird which was very loath to leave. It, however, rose on our close approach and rapidly soared skywards. When well out of reach it was joined by a companion and uttered shrill shrieks of defiance. The second nest was located about three miles from the first, and some five miles from home. This, unlike the first, was situated upon the point of a hill which rose some 20 feet above the surrounding level. This hill, however, was by no means isolated, there being numerous others round about, some of them actually higher, its only advantage in comparison being that it reached more of a point at one end where the nest was placed. The nest itself was of a decidedly bulky nature, being built of large sticks, with smaller ones and some bark as a lining. In this were seven eggs, the greatest number I have ever observed in one nest, the usual number being four, and not infrequently one finds only three. The third nest, like No. 1, was situated in a dwarf oak growing this time at the bottom of a hill. It contained no eggs, though a few green leafy boughs in it showed that its builders had recently been at work. This nest was about two and a half miles from No. 2, and on account of its distance from home was not again visited.

On June 27th I visited the first two nests for the second time. No. 1 now had some downy young in it, two striped gophers (*Cetellus tridecemlineata*) and one gray gopher (*C. Richardsonii*). No. 2 harboured five young and one egg, the young being half grown, though of different ages as usual. They were curious fluffy fellows, having a mixture of down and feathers, the latter being chiefly confined to the wings. They all opened their beaks as I approached, and the largest, as if guardian over the rest, did his best to defend them and frighten me away. In this nest half a gray gopher was the only available food.

On July 4th I was again in the vicinity, and found No. 1 nest with the young still present, and that their hunger had been recently appeased was evident from the presence of two untouched striped gophers in the nest. In nest No. 2 the young were still unable to fly, though three had made their way some distance along the hill. I returned these for the sake of a photograph, and they made very little effort to prevent my handling them. Curiously enough, there was still but one of a pugnacious nature, and he, as previously, seemed to consider himself

in charge of the remainder, and in that capacity resented in a ferocious manner my handling of the rest. One of the parents also made a half-hearted effort to frighten me by diving towards me. It took good care, however, to remain well out of reach. In the nest at the time were two gray gophers, one of them partly eaten, showing in spite of five almost fully grown young that the parents were able to keep the larder well supplied. I would like to draw attention here to the habit these birds have of going far afield for their hunting. In the case of nest No. 2 the nearest gray gopher colony was fully two miles away, while to secure them in numbers entailed a journey of four or five miles, and there is reason to believe that the hawks went even further than this. That they usually flew directly to their hunting grounds was also evident from the fact that in no instance were striped gophers found in the nest, though those rodents were met with more than once in its vicinity. While the hawks keep the nest and its immediate surroundings free from refuse, I was, nevertheless, able to secure a few pellets, which, as is well known, all birds of this kind disgorge. An examination of these revealed much gopher hair, a few feet of those animals, and two feet of a meadowlark, both in the same pellet, showing that they doubtless belonged to one bird.

As I left the nest its defender still stood erect on its edge watching my every movement, like a sentry on duty, and thus he remained until distance hid him from my sight.

On July 5th, a parent hawk which was flying very high, suddenly made one of those dives for which the birds are remarkable. In a moment it was among a brood of young turkeys, and but for their remarkable instinct in hiding, and my presence soon after, would have undoubtedly carried off one of them. As it was, the hawk continued on its journey southward to the usual hunting grounds.

On July 17th I visited nest No. 1 for the last time. I found it inhabited by four almost fully-fledged young. I had, in fact, just taken a photograph, and was searching for pellets beneath the nest, when the strongest bird flew out, but finding its weight still too great for its wings, it came to earth rather suddenly some 40 yards away, not, however, with sufficient force to be injured, as was indicated by the vicious manner in which it met me as I approached. Its onslaught was most determined, and I was obliged to defend myself with a spade, which the hawk struck repeatedly with its claws, but never with the beak. When exhausted with its efforts at jumping, it threw itself upon its back and strack out with both feet. Having finished my observations I retired, the hawk actually making after me, evidently considering that I was being driven from the field. The

other birds remained in the nest in company with two striped gophers, one being partly devoured. Pellets around the tree showed much gopher hair and some broken bones, but no indication of birds. It seems strange that this pair of hawks fed their young mostly upon striped gophers, while those of No. 2 preferred gray ones; doubtless situation had something to do with this, though both kinds of gophers were within reach. Another nest I had not previously visited was located in an aspen poplar, in an opening among the lower trees. There was a single hawk in the nest which immediately flew on my approach and disappeared in the distance. In this case the parent birds, as is customary, had been shrieking overhead while I was yet more than a mile away, and had even attacked me in the usual timid manner. As a matter of fact it was their own stupidity that led me to the nest, which but for their efforts I should never have found. Pellets in this instance were absent, consequently I could learn nothing of the birds' food habits.

To those unacquainted with the fauna of Manitoba the question might arise, how do these hawks manage to defend themselves while nesting on the ground, particularly upon a hill which is so frequently used as a vantage spot by coyotes. Is it that hawks make but poor eating, or do the coyotes, badgers, etc., fear those formidable claws? I do not know, but suspect the latter is more probably correct.

It is a very great pity that lack of knowledge regarding the usefulness of these hawks has caused them to be so severely persecuted. We are all of us aware in the west what a large toll gophers take of our crops, yet strange to relate, we seem to have done our best to propagate them by destroying the hawks and weasels, which are their natural enemies.

FIFTY-SECOND ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

This meeting will long be remembered by those present as an extremely successful gathering, at which members convened from both ends of the Dominion, to meet their fellow workers at the Capital. The meetings of this Society have long been known for their successful programmes, but if we are to believe those competent to judge, the gatherings on the 4th and 5th of November last excelled in this respect any previous conventions, and in point of value to agriculture, were to Canada equally as profitable as the meetings of the Association of Economic Entomologists are to the United States.

The meeting was held in the large laboratory of the Entomological Branch, Department of Agriculture, Ottawa, thus not only providing ample accommodation, but also enabling visitors to inspect the large collections of insects housed there. While the Society had to deplore the unavoidable absence of Dr. Howard, Chief of the United States Bureau of Entomology, who was to have delivered the popular lecture, we were fortunate in securing instead another distinguished American in the person of Dr. H. T. Fernald, of Amherst, Mass., who delivered, on Thursday evening, November 4th, a most interesting and instructive lecture, the title of which was "Life Zones in Entomology in relation to Crops."

It is unnecessary to mention the names of all those present; sufficient to relate that the meetings were very largely attended. There were, however, a few visitors who cannot well be passed over, namely: Prof. C. P. Lounsbury, Chief of the Division of Entomology, Department of Agriculture, Pretoria, Union of South Africa; Mr. A. F. Burgess, who has charge of the United States gipsy and brown-tail moth work, and Dr. Hugh Glasgow, of Geneva, N.Y. In addition to many prominent members of the Society, there were in attendance all the scientific staff of the Dominion Entomological service, as well as the following well known Canadian visitors: Sir James Grant, Dr. F. S. Torrance, Veterinary-Director General; Dr. F. T. Shutt, Dominion Chemist; Mr. W. T. Macoun, Dominion Horticulturist; Dr. C. H. Higgins, Pathologist, Dominion Department of Agriculture; Mr. H. T. Gusrow, Dominion Botanist; Mr. R. H. Campbell, Director of Forestry; Mr. W. Ide, private secretary to the Minister of Agriculture; and Mr. D. Johnson, Dominion Fruit Commissioner.

The papers read, while usually of a scientific nature, and therefore of interest to a limited audience, provided, nevertheless, some noteworthy exceptions, which must have appealed to any lover of wild life. In this connection we would mention the paper of the Rev. Dr. Fyles, of Ottawa, on "Observations upon some of the Predaceous and Parasitic Hymenoptera,"; "The Home of Gortyna stramentosa," by Mr. A. F. Winn, of Montreal; "The Founding of the Science of Cecidology," by Dr. A. Cosens, of Toronto; and "Fresh Woods and Pastures New," by Mr. F. J. A. Morris, of Peterboro, Ont.

Of truly scientific papers, of which there were many notable contributions, we will mention but one: Dr. Seymore Hadwin's, of Agassiz, B.C., "Further Notes on the Warble Fly (*Hypoderma bovis*)," a valuable contribution, in which the writer produces conclusive evidence as to how the larvæ enter the bodies of cattle, the method being quite at variance with ideas previously held. All the papers presented at the meetings will

ultimately appear in the Annual Report of the Society, and should be in the hands of all interested in either agriculture or entomology.

The meetings were presided over by the President, Dr. C. Gordon Hewitt, until the last afternoon, when setting a new and appropriate precedent he vacated the chair in favour of the newly elected president, Mr. A. F. Winn. The other officers elected were: Vice-President, Prof. L. Cæsar, Guelph; Secretary-Treasurer, Mr. A. W. Baker, Agricultural College, Guelph; Curator, Mr. G. J. Spencer, O. A. College, Guelph; Librarian, Rev. Prof. C. J. S. Bethune, Guelph. Directors: Division No. 1, Mr. Arthur Gibson, Ottawa; No. 2, Mr. C. E. Grant, Orillia; No. 3, Dr. A. Cosens, Toronto; No. 4, Mr. C. W. Nash, East Toronto; No. 5, Mr. F. J. A. Morris, Peterboro; No. 6, Mr. J. W. Noble, London, and No. 7, Mr. W. A. Ross, Vineland Station.

On Friday evening, November 5th, a smoker was held in honour of the Society, the hosts being the entomological section of the Ottawa Field-Naturalists' Club, the president, Mr. Arthur Gibson, welcoming the members in a short speech. The proceedings that followed were presided over by Dr. Hewitt, and were greatly enjoyed. They ended, as was to be expected, in the height of good fellowship.

N. C.

THE CANADIAN FISHERIES MUSEUM.

Members of the Ottawa Field-Naturalists' Club will be interested to learn that the above-mentioned museum has been recently entirely remodelled by Mr. Andrew Halkett, the well known naturalist of the Dominion Fisheries. The object of this museum is to display in an educational manner all forms of aquatic life, and chiefly to illustrate the value of our vast fishery resources. The fishes proper, which for the most part are mounted specimens of the fishes themselves, are beautifully arranged and classified, according to Mr. Halkett's recently published "Check-List of the Fishes of the Dominion of Canada and Newfoundland," in cases around the walls on the ground floor of the museum. In view of much additional material, most of which has been recently acquired and mounted, the large room up stairs, formerly used as an Art Gallery, will in the near future be devoted for the display of this material, and will, therefore, soon be open to the general public. A conspicuous object which will be on view in this room will be a mounted skeleton of a Fin-back Whale, 51½ feet long, from the Seven Islands Whaling Station, Gulf of St. Lawrence.

Whilst the direct object of the Fisheries Museum is to point out the value of the Canadian fishery resources, yet incidental to the collection there are also on view a variety of natural objects, embracing fishes, corals, sponges, mollusk shells, etc., from the Bahama Islands, and such form an ornamental feature of the museum.

Models of vessels, weirs, traps, etc., to illustrate the fishing industry, are also on exhibition.

Recently two specimens of octopus or devil fish have been installed, and are to be seen in glass cases, preserved in a solution of formalin. These specimens are from the coast of British Columbia.

OTTAWA FIELD NATURALISTS' CLUB.

PROGRAMME OF WINTER LECTURES.

December 7th, 1915 (Tuesday).—"Wheat Improvement in Canada." Dr. Charles E. Saunders, Dominion Cerealist, Ottawa.

January 11th, 1916 (Tuesday).—"Canadian Folk-tales and Oral Traditions." Mr. C. M. Barbeau, Division of Anthropology, Geological Survey, Ottawa.

January 25th, 1916 (Tuesday).—"The Use of Ornamental Trees and Shrubs." (Illustrated with lantern views). Mr. W. T. Macoun, Dominion Horticulturist, Ottawa.

February 8th, 1916 (Tuesday).—"The Formation of the Great Plains." (Illustrated with lantern views.) Mr. D. B. Dowling, Geological Survey, Ottawa.

February 22nd, 1916 (Tuesday).—"The Evolution of Army Sanitation." R. Lorme Gardner, M.D.

March 7th, 1916 (Tuesday).—"The Identification and Nesting Habits of Some of our Common Birds." (Illustrated with specimens and lantern views.) Mr. W. E. Saunders, London, Ontario.

March 21st, 1916 (Tuesday).—Annual Meeting, Exhibits and Brief Addresses by Members.

All the above meetings will be held in the auditorium of the Victoria Memorial Museum.

The Ottawa Field-Naturalists' Club.

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