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THE OTTAWA NATURALIST

Vol. XXXI.

FEBRUARY, 1918.

No. 11.

THE BIRDS OF EDMONTON.

By J. DEWEY SOPER, PRESTON, ONT.

Considering the geographical situation of Edmonton, the locality possesses a surprising wealth of bird life; not less than one hundred and forty-three species have been recorded from the vicinity.

The superficial survey of a map discloses the fact that Edmonton, Alta., lies in the same latitude as southern Labrador and Ungava, and yet compares very favorably, as regards climate, with parts of southern Ontario, about six hundred miles in latitude to the south. One is forced to reflect that latitude alone is a poor and deceptive medium by which to judge the climatical conditions of a region. On climate, of course, depends largely the existence or non-existence of many of our birds, especially the less hardy species, and of these a generous number are represented in the faunal life of the Edmonton territory.

Two distinct floral conditions exist at Edmonton, one comprising the usual poplar forest of the north-west, and the other the coniferous tracts of the river basins and adjacent ravines. The deciduous growth of the uplands with their deforested areas, interspersed with lakes and marshes, together with the gloomy forests of the river valleys, offer it seems, quite a diversification or latitude in the accommodation of avian life.

My observations were conducted during three summers and two winters, from 1912 to 1914. I have been favored, in making my list as complete as possible, with the numerous references in Macoun's Catalogue of Canadian Birds, embracing in part the observations of Mr. William Spreadborough and Mr. Geo. Atkinson on many species occurring in the Edmonton district. To these gentlemen I feel indebted. My thanks are due to Mr. P. A. Taverner, who kindly assisted in matters of nomenclature and identification.

WESTERN GREBE (*Aechmophorus occidentalis*).—Observed occasionally during the fall.

HORNED GREBE (*Colymbus auritus*).—Common summer resident. Breeds; nests from June 5 to 25.

PIED-BILLED GREBE (*Podilymbus podiceps*).—This species was reported at Edmonton, in 1906, by Geo. Atkinson.

HERRING GULL (*Larus argentatus*).—Very common during the spring and early summer. There is yet some doubt as to the specific identity of the large gull of the *argentatus* type which frequents the prairie provinces and north-westwards to Edmonton. Presumably this reference should belong under *californicus*.

FRANKLIN ROSY GULL (*Larus franklinii*).—Very common usually during the latter part of June and early July.

BLACK TERN (*Hydrochelidon nigra surinamensis*).—Abundant breeder about the sloughs. Arrives about May 20. Nests early in June; the young are born about June 26, and take to the water by July 14.

AMERICAN WHITE PELICAN (*Pelecanus erythrorhynchos*).—In all probability may be expected in the Edmonton district as Wm. Spreadborough records them breeding on Lake Ste. Anne, north-west of Edmonton, in 1898.

MALLARD (*Anas boschas*).—Occasionally noted during the spring and fall. A few may breed as Mr. Spreadborough found a nest on June 7, 1897. Changing conditions due to much recent settlement of the country may have its influence on the wilder breeding water fowl, forcing them back to more remote localities.

GADWELL (*Chaulelasmus streperus*).—Breeds in limited numbers. Arrives about May 10. Young nearly full grown by August 1.

AMERICAN WIDGEON OR BALDPATE (*Mareca americana*).—Mr. Spreadborough reports this species as common at Edmonton in 1897, a few arriving as early as April 17. By May 5, but not until then, were they common. They were breeding at that time.

GREEN-WINGED TEAL (*Nettion carolinensis*).—Tolerably common. Breeds. Arrives about May 5. I have observed individuals on the White-mud river as late as November 1.

BLUE-WINGED TEAL (*Querquedula discors*).—Common. Breeds. Arrives about May 1.

SHOVELLER OR SPOON-BILL (*Spatula clypeata*).—Frequently observed during the spring and fall migrations.

REDHEAD (*Marila americana*).—Mr. Spreadborough collected a male at Edmonton on May 18, 1897.

CANVAS-BACK DUCK (*Marila vallisneria*).—Common during spring and fall. Breeds sparingly.

AMERICAN SCAUP DUCK (*Marila marila*).—Noted during the spring migrations.

AMERICAN GOLDEN-EYE (*Clangula clangula americana*).—The first water fowl to arrive in the spring, which is about April 6. Does not breed in the vicinity.

BUFFLE-HEAD (*Charitonetta albeola*).—Rather uncommon. Occasionally observed in May and August.

WHITE-WINGED SCOTER (*Oidemia deglandi*).—Mr. Spreadborough reported this species as common at Lake Ste. Anne on June 9, 1898, not far from Edmonton.

RUDDY DUCK (*Erismatura jamaicensis*).—Fairly common in spring. Arrives about May 1. Apparently does not breed in the vicinity.

CANADA GOOSE (*Branta canadensis*).—Migrants observed in spring about May 10.

AMERICAN BITTERN (*Botaurus lentiginosus*).—Common breeder about all the sloughs.

CAROLINA RAIL (*Porzana carolina*).—Fairly common summer resident. On November 10, 1912, I found an individual with a fractured wing-bone, frequenting an open spring.

AMERICAN COOT (*Fulica americana*).—The most common breeding water-fowl at Edmonton. Arrives about May 1; nests May 20, eight to eleven eggs to the clutch; young born about June 6.

NORTHERN PHALAROPE (*Phalaropus lobatus*).—Mr. Atkinson noted this species at Edmonton, August, 1906.

WILSON PHALAROPE (*Steganopus tricolor*).—A female was taken by Mr. Spreadborough, at Edmonton, on May 26, 1897.

WILSON SNIPE (*Gallinago delicata*).—Uncommon. Evidently does not breed in the vicinity.

DOWITCHER (*Macrorhamphus griseus*).—Mr. Spreadborough collected both the male and the female at Edmonton, on May 3, 1897. These are undoubtedly the Long-billed *scolopaceus*.

PECTORAL SANDPIPER (*Pisobia maculata*).—Reported by Mr. Atkinson as abundant after August 6, 1906.

LEAST SANDPIPER (*Pisobia minutilla*).—Rather uncommon; individuals observed as late as July.

SANDERLING (*Calidris arenaria*).—Noted in considerable numbers by Mr. Atkinson, between Saskatoon and Edmonton, in 1906.

MARbled GODWIT (*Limosa fedoa*).—Noted as far west as Edmonton, in 1906, by Mr. Atkinson.

GREATER YELLOW-LEGS (*Totanus melanoleucus*).—Occurs as a migrant.

LESSER YELLOW-LEGS (*Totanus flavipes*).—Usually a few flocks observed about April 25. They may breed, as I have observed them as late as July.

SOLITARY SANDPIPER (*Helodromas solitarius*).—During the spring of 1897, Mr. Spreadborough saw numbers at Edmonton. He believes they breed.

WILLET (*Symphemia semipalmata*).—A male bird was collected by Mr. Spreadborough on May 5, 1897. Presumably this is referable to *inornata*.

BLACK-BELLIED PLOVER (*Squatarola squatarola*).—Mr. Spreadborough took a female on May 21, 1897.

AMERICAN GOLDEN PLOVER (*Charadrius dominicus*).—A male was taken by Mr. Spreadborough on May 20, 1897.

KILDEER PLOVER (*Oxyechus vocifera*).—Common breeder. Arrives about April 15.

SEMPALMATED PLOVER (*Ægialitis semipalmata*).—I have only one record, a flock seen on May 13, 1912, feeding along the margin of a pond.

RUFFED GROUSE (*Bonasa umbellus*).—Common permanent resident. This form is probably referable to *umbelloides*.

SHARP-TAILED GROUSE (*Pedioecetes phasianellus*).—Common permanent resident. No doubt referable to the sub-specific form *campestris* as Mr. Atkinson recorded it as far west as Edmonton, in 1906. Mr. Spreadborough, in 1897, also, observed individuals as far as twenty-five miles west of that place.

MARSH HAWK (*Circus hudsonius*).—Common summer resident. Breeds.

AMERICAN GOSHAWK (*Accipiter atricapillus*).—Occasionally observed. More common further west.

RED-TAILED HAWK (*Buteo borealis*).—Not uncommon. Nests along the Saskatchewan river. "The form occurring here is no doubt referable to sub-species *Calurus*."—(P. A. Taverner).

SWAINSON HAWK (*Buteo swainsoni*).—Mr. Spreadborough collected a female at Edmonton on May 6, 1897.

AMERICAN ROUGH-LEGGED HAWK (*Archibuteo lagopus sanctijohannis*).—Mr. Spreadborough observed a bird of this species at Edmonton in April of 1897.

PIGEON HAWK (*Falco columbarius*).—Macoun's Catalogue states that Mr. Spreadborough found this species nesting at Edmonton in 1897. Mr. Taverner informs me that it is not quite clear whether Spreadborough recognized both forms of Pigeon Hawk. All his specimens in the Geological Survey collection are typical *richardsonii*.

RICHARDSON MERLIN (*Falco richardsonii*).—Taken on different occasions by Mr. Spreadborough during the spring of 1897.

AMERICAN SPARROW HAWK (*Falco sparverius*).—Fairly common. Breeds.

LONG-EARED OWL (*Asio wilsonianus*).—A female was collected by Mr. Spreadborough on May 15, 1897. He found it nesting in spruce woods.

SHORT-EARED OWL (*Asio accipitrinus*).—A few individuals were observed by Mr. Spreadborough during May, 1897.

SAW-WHET OWL (*Cryptoglaux acadica*).—I only observed two individuals of this little owl. Mr. Spreadborough records it in the spring of 1897.

GREAT HORNED OWL (*Bubo virginianus*).—Not uncommon. Many each fall are shot and taken to taxidermists. I think *subarcticus* occurs as I have seen very light colored birds; *pallescens*, too, may occur as a straggler, and *saturatus* as a winter migrant, but I have not had material for exact sub-specific comparison.

BELTED KINGFISHER (*Ceryle alcyon*).—Breeds along the Saskatchewan and White-mud rivers.

HAIRY WOODPECKER (*Dryobates villosus*).—Reported as occurring at Edmonton by Mr. Spreadborough. Records by Mr. Atkinson and Mr. Spreadborough also refer many of the specimens to *leucomelas*. I found them nesting on May 12, 1912.

DOWNY WOODPECKER (*Dryobates pubescens medianus*).—More common during spring and summer than during winter. Mr. Spreadborough found them rather rare in 1897, but they were common during the spring and summer of 1912 and 1913.

ARCTIC THREE-TOED WOODPECKER (*Picoides arcticus*).—Collected one specimen among the spruces along the Saskatchewan river on February 21, 1913. The only individual observed there.

YELLOW-BELLIED SAPSUCKER (*Sphyrapicus varius*).—Common summer resident. Arrives early in May.

NORTHERN FLICKER (*Colaptes auratus luteus*).—Common summer resident. Arrives about April 21.

RED-SHAFTED FLICKER (*Colaptes cafer*).—I saw a mounted specimen of this species in the city, but failed to make inquiries as to where it was taken. It is probable that this or the hybrid flicker may occur in the Edmonton district. Mr. Taverner informs me that he found a strong infusion of *cafer* among the specimens he took at Red Deer, Alta., during the summer of 1917.

NIGHT HAWK (*Chordeiles virginianus*).—Common summer resident. Arrives about May 28.

CHIMNEY SWIFT (*Chaetura pelagica*).—Mr. Spreadborough noted two individuals at Edmonton on May 17, 1897.

KINGBIRD (*Tyrannus tyrannus*).—Common summer resident. Arrives about May 24. Nest completed and full set of eggs by June 20.

PHOEBE (*Sayornis phoebe*).—Not very common. Arrives early in May.

SAY PHOEBE (*Sayornis saya*).—Observed by Mr. Spreadborough in 1897. He collected two females, one on May 5, the other on May 7.

WESTERN WOOD PEWEE (*Myiochanes richardsonii*).—Mr. Spreadborough collected a male on June 2, 1897.

TRAILL FLYCATCHER (*Empidonax traillii*).—This form was met with by Mr. Spreadborough at Edmonton in 1897. First seen May 26, common by June 2. This bird is no doubt referable to the

sub-specific form *alnorum*.

LEAST FLYCATCHER (*Empidonax minimus*).—By far the commonest flycatcher at Edmonton. It may always be heard uttering its unmusical *che-pec* wherever the usual poplar forest exists. They arrive by May 16 and in two days are common. It is probable that the males precede the other sex by that much time. Their nest is a marvel of beauty and skill, and is usually completed and the full compliment of eggs laid by June 6.

HORNED LARK (*Otocoris alpestris*).—Apparently rare at Edmonton. According to my notes only once heard or seen, namely on March 25, 1913. The breeding form at Edmonton is possibly *leucomelas*, though *alpestris* and *hoyti* may also occur in migration.

BLUE JAY (*Cyanocitta cristata*).—Uncommon. Occasionally seen along the rivers in the heavier growth.

CANADA JAY (*Perisoreus canadensis*).—Mr. Spreadborough found this species in the Edmonton district in 1897. During 1912-13-14 I never once saw this bird, although it is very common in the foot-hill and mountain country to the west, where I saw it during the fall of 1913. I am informed by Mr. Taverner that Mr. H. C. Oberholser has determined Spreadborough's specimens as the type form *canadensis*.

AMERICAN CROW (*Corvus brachyrhynchus*).—Common summer resident. Arrives about April 1. Geographically this form should be the western crow *hesperis*.

COW BIRD (*Molothrus ater*).—Common summer resident. Arrives May 16. On June 13, 1913, I found an egg belonging to this bird in the nest of a Yellow Warbler.

YELLOW-HEADED BLACKBIRD (*Xanthocephalus xanthocephalus*). Common summer resident. Nests in the same localities with the red-wing.

REDWINGED BLACKBIRD (*Agelaius phoeniceus*).—Very common summer resident. Arrives about April 25. The form inhabiting the prairies and the far north has been, in the past, referred to *A. p. fortis*. Mr. Oberholser has since sub-specifically referred it to *arctolegus*.

WESTERN MEADOW LARK (*Sturnella neglecta*).—Cannot be called common. Arrives about May 17. The song of this species is quite distinct from the eastern meadow lark. Mr. Taverner informs me that it is now given full specific standing.

BALTIMORE ORIOLE (*Icterus galbula*).—Breeds at Edmonton but is not plentiful. Arrives May 20.

RUSTY BLACKBIRD (*Euphagus carolinus*).—Very abundant breeder. Arrives about April 10. I once saw a single individual among the rushes of a frozen marsh, on November 25.

(To be continued).

ON THE GENUS TRACHODON OF LEIDY¹.

BY LAWRENCE M. LAMBE, F.R.S.C.

Vertebrate Palæontologist, Geological Survey, Canada.

The generic term *Trachodon* first appeared in palæontological literature in 1856² when Dr. Joseph Leidy used it in describing teeth and tooth-fragments of herbivorous dinosaurs under the name *T. mirabilis*. These teeth were discovered by Dr. F. V. Hayden in the "bad lands" of Judith river, Montana (then included in Nebraska), U.S.A., in deposits which are now generally regarded as synchronous, or nearly so, with the Belly River formation of Alberta, Canada. This was the first descriptive reference to remains of the North American Cretaceous herbivorous dinosaurs which have since been usually referred to as constituting the family *Hadrosauridae* (*Trachodontidae*) related to the *Iguanodontidae* of Europe, the two families being classed under the suborder *Ornithopoda* of the *Pre-dentata*.

The identification of this genus is rendered uncertain by the paucity of material on which it was established.

Following the description of *Trachodon* in 1856, Leidy in the same year described two caudal vertebræ and a phalanx of a dinosaur from the "Lignite formation of Grand river, Nebraska," (Lance formation) under the name *Thespesius occidentalis*.

This genus rests on as unsatisfactory a basis as *Trachodon* as inferences drawn from the type material, which in this case as in *Trachodon* must be considered inadequate, have too great an element of conjecture.

The third genus, and the first to be founded on fairly comprehensive material was *Hadrosaurus*, established by Leidy in 1858 on remains from the Cretaceous marls near Haddonfield, New Jersey. That *Hadrosaurus*, of which many bones of the skeleton as well as teeth from both jaws, presumably of one individual, are known, is not generically the same as *Trachodon* is most probable when we compare the teeth of the former having papillated margins and a rounded apex, with the smooth margined, sharply pointed tooth of the latter.

In 1860³ Leidy described the Judith river teeth at greater length with good illustrations. Of the six teeth figured, two are nearly complete, the other four are fragmentary. The tooth first mentioned in the description (figures 1—6) is that of a hadrosaur. The last one (figures 18—20) belongs to a ceratopsian, and three of the four fragmentary ones are probably assignable to the *Hadrosauridae*.

The close affinity of *Trachodon*, as represented by the meagre

¹Communicated with the permission of the Deputy Minister of Mines.

²Proc. Acad. Nat. Sci. Phila., vol. VIII, p. 72.

³Trans. Am. Phil. Soc. vol. XI, pp. 140-143, pl. 9, figs. 1-20.

material above mentioned, to *Hadrosaurus* was recognized⁴ by Leidy, who also suspected that the ceratopsian tooth which he had included in the description of *Trachodon mirabilis* might not properly belong there⁵. He suggested that the best preserved tooth originally referred to *Trachodon* might be included with *Hadrosaurus*, reserving for the ceratopsian tooth the generic term *Trachodon*. If this suggestion were acted on *Trachodon* would necessarily become a genus of horned-dinosaur. The term *Trachodon*, however, has passed extensively into the literature of the North American dinosaurs in connection with bipedal, herbivorous Cretaceous forms and, if retained as a name denoting a genus, had best remain with this association. Unfortunately it has been used for the reception of inadequately represented and imperfectly understood diverse forms of these dinosaurs from different horizons of the Cretaceous.

The tooth of *Trachodon*, first mentioned in Leidy's original description, and later figured first in his plate of illustrations and referred to as being the most important of the specimens should be considered the type of the genus. On the characters of this tooth, therefore, must the validity of the genus *Trachodon* rest. The tooth is from the lower jaw, and if the figure illustrating it be correct, and there is every reason for believing it so, it is very pointed above. As regards the lithographic illustrations of Dr. Leidy's paper of 1860 in the Transactions of the American Philosophical Society, vol. XV., their artistic merit is so pronounced, and all the figures of the three large plates have so much the appearance of being accurate portrayals of the fossils themselves that it appears reasonable to assume that the type tooth of *T. mirabilis* is not shown too pointed at the apex.

Since the days of this pioneer work many new forms of hadrosaur dinosaurs have been described from excellent and wonderfully complete material collected in the Cretaceous of the west both in Canada and the United States, particularly in recent years from the Belly River and Edmonton formations of Alberta. In none of the Belly River genera best known from unusually perfect skulls, such as *Stephanosaurus* Lambe, *Gryposaurus* Lambe, and *Prosaurolophus* Brown, are the teeth acutely pointed as in *Trachodon* Leidy. It is necessary, therefore, to conclude that the genus *Trachodon* is as yet unknown in the Belly River, and fully or partially synchronous formations, except from this single mandibular tooth. Nor is this genus recognizable in the Edmonton and Lance formations, or their equivalents, of the later Cretaceous, in such forms, known from nearly perfect skulls, as *Diclonius* Cope, "*Claosaurus*" Marsh, *Saurolophus*

⁴Smith. Contr. Know. vol. XIV, p. 84, 1855.

⁵Remarks on a jaw fragment of *Megalosaurus*, by Joseph Leidy, M.D., Proc. Acad. Nat. Sci. Phila., vol. XX, p. 199, 1868.

Brown, *Cheneosaurus* Lambe, and *Edmontosaurus* Lambe. In fact a smooth margined normally shaped tooth as pointed as the type of *Trachodon* is not found in any of the above mentioned genera of Belly River and later Cretaceous times. If the name *Trachodon* is to be retained it can only be regarded as denoting a genus based on a tooth supplying as yet insufficient diagnostic characters. If the tooth is normal in shape the genus it represents is not recognizable among the many forms now known from comprehensive and well preserved material. If the tooth is abnormal it has little or no value from a palæontological standpoint and the name *Trachodon* had best be discontinued in use.

As a result of the variety of hadrosaurs discovered of late years, principally in the Cretaceous of Alberta, Canada, we now have accurate knowledge of many genera displaying a wonderful variance in cranial development in crested and non-crested forms from *Stephanosaurus*, with a skull higher than long, to *Diclonius* with a lengthened and very depressed head.

Hatcher in 1902⁶ in a paper on the genera and species of *Trachodontidae*, expressed the opinion that two genera only, *Trachodon* Leidy and *Claosaurus* Marsh (represented by *C. agilis*), should be retained of the many proposed prior to 1892. That many of the genera and species referred to in his paper are founded on insufficient material is obvious. The many discoveries of late years of crested and non-crested types make it desirable that a thorough revision of the family should be now undertaken.

As regards the name of the family, for the reception of the various genera of North American Cretaceous bipedal, herbivorous dinosaurs, the term *Hadrosauridae* was proposed by Cope in 1869⁷ (1871), and has precedence to *Trachodontidae* used by Lydekker in 1888⁸, and later by Marsh in 1890⁹. Quite apart from any question of precedence the name *Hadrosauridae* is much to be preferred of the two when we consider the material on which the genera *Trachodon* and *Hadrosaurus* are founded. The characters of *Trachodon* are unknown beyond those of the single mandibular tooth constituting the type, although many have been assigned to it for which there is no warrant. The material on which *Hadrosaurus* rests includes a number of cervical, dorsal, and caudal vertebræ, the principal bones of the fore and hind limbs, an ilium, an ischium, a portion of a dentary bone, and a number of both upper and lower teeth; unfortunately the cranium is not represented.

⁶The genera and species of the Trachodontidae (Hadrosauridae, Claosauridae) Marsh. Annals of the Carnegie Museum, vol. I, pp. 377-386.

⁷The extinct Batrachia, Reptilia, and Aves of North America, Trans. Am. Philos. Soc. vol. XIV, new series, 1871, p. 91.

⁸Cat. of fossil Reptilia and Amphibia in Brit. Mus., pt. I, 1888, p. 241.

⁹Additional characters of the Ceratopsidae, with notice of new Cretaceous dinosaurs. Am. Journ. Sci., third series, vol. XXXIX, 1890, p. 424.

The *Hadrosauridae* appear to fall into two natural groups or subfamilies, the crested forms with a "footed" ischium, and the non-crested ones having an ischium ending distally in a point. For these subfamilies the names *Saurolophinae* and *Trachodontinae* respectively were proposed by Brown in 1914. *Saurolophinae*, typified by *Saurolophus* Brown, fully meets all requirements as a group-name. *Trachodontinae* on account of the dubiousness of the genus *Trachodon* fails in this regard, and *Hadrosaurinae* is suggested as a preferable term. The genus *Hadrosaurus* was most probably a non-crested form, reliance being placed on the evidently pointed termination of its ischium. It is impossible to state whether *Trachodon* was a crested or non-crested form.

Adopting these subdivisions of the *Hadrosauridae*, the genera of which the structure of the head is best known may be grouped as follows, with the earlier types of the Belly River formation first:—

HADROSAURINÆ.		SAUROLOPHINÆ.	
<i>Gryposaurus</i> Lambe,	Belly River.	<i>Stephanosaurus</i> Lambe,	Belly River.
<i>Edmontosaurus</i> Lambe,	Edmonton.	<i>Prosaurolophus</i> Brown,	Belly River.
<i>Kritosaurus</i> Brown,	Horizon uncertain? = Edmonton.	<i>Corythosaurus</i> Brown,	Belly River.
" <i>Claosauous</i> " Marsh,	Lance.	<i>Saurolophus</i> Brown,	Edmonton.
<i>Diclonius</i> Cope,	Lance.	<i>Chencosaurus</i> Lambe,	Edmonton

Hypacrosaurus Brown is a genus from the Edmonton formation of Alberta. Its skull, as yet unknown, will probably be found to be crested as the ischium is expanded distally into a "foot." Like *Hadrosaurus* its assignment to a subfamily depends at present on the shape of the ischium. *Hypacrosaurus* is stated by Brown to also occur in the Belly River formation of Alberta.

The complete skeleton of a large hadrosaur from the Lance formation of Dakota, now mounted in the American Museum of Natural History, New York, and referred to generally as *Diclonius mirabilis*, was described by Cope, under this name, in 1883, with special reference to the cranial characters.

Cope identified this Lance species with *Trachodon mirabilis* of the Judith River beds, substituting the name *Diclonius* for *Trachodon* on the supposition that the latter had been abandoned by Leidy. Cope, prior to this, had described three species of *Diclonius*—*D. pentagonus*, *D. perangulatus*, and *D. calamarius*—without figures, from shed teeth from the Judith River formation, which teeth are stated to be no longer identifiable in the Cope collection. It would seem to be best, therefore, in the interests of palæontology, to discontinue the use of these three specific names.

Although a comparison of *Trachodon mirabilis* Leidy, (represented by a single tooth) with *Diclonius mirabilis* Cope, (known from the complete skeleton) is necessarily limited, it is clear that the two forms are not conspecific, the pointed tooth of the former differing in a marked degree from the teeth of the latter with apices rounded in lateral outline as figured by Cope. It is difficult, if not impossible, to arrive at any conclusion regarding their generic relationship, but it is highly probable, in view of their difference in geological age, that they are not congeneric. It is considered best, therefore, under the circumstances, to retain the generic term *Diclonius* in association with the Lance species which has been so long known to palæontologists generally as *Diclonius mirabilis* of Cope.

The genus *Claosaurus* was established by Marsh in 1890 on the remains of a small hadrosaur, from the Niobrara of Kansas, which had been described by him in 1872 under the name *Hadrosaurus agilis*. There were available for comparison the more important portions of the skeleton, but no parts of the skull except teeth were obtained. To this genus Marsh later assigned a species, from the Lance formation of Wyoming, which he described, from comprehensive material (including the skull) as *C. annectens*.

That Marsh was wrong in referring his Wyoming species to so early a genus as *Claosaurus* is most probable. That the species belongs to the genus *Hadrosaurus* is unlikely. The genus *Trachodon*, to which this species is sometimes assigned, is not definable and therefore cannot be properly used for its reception.

The species *annectens* of Marsh comes under the sub-family *Hadrosaurinae* and probably belongs to an unnamed genus. For the purpose, however, of this paper the generic term *Claosaurus* is made use of to receive it.

Dr. C. W. Gilmore, writing in 1910¹⁰ on the genus *Trachodon*, concludes, in part, that "the use of the term *Trachodon* should be restricted in its application to some one of the trachodonts found in the older beds" (Belly River, Judith River, etc.). To which then of the several at present known Belly River genera could the term *Trachodon* be applied?

BRIEF NOTES ON THE PREVALENCE OF CERTAIN BIRDS IN BRITISH COLUMBIA.

BY ALLEN BROOKS,

Major, British Expeditionary Force, France.

Band-tailed Pigeons (*Columbia fasciata* Say)—Very few of these are killed in B. C. The depletion must come in their winter quarters.

¹⁰Science, new series, vol. XLI, p. 658.

Cranes and Swans—These birds suffer in their breeding haunts in the far north. Few are killed after they migrate. Both must have conditions where they are not much disturbed when at rest; large bodies of water free from pleasure craft for swans and large open plains for cranes. They mostly now pass over their former winter quarters and those they used on migrations formerly, as they are too much disturbed. Protection will not change this.

Long Billed Curlew (*Numenius americanus* Wies.) are bound to decrease and perhaps disappear. Their favourite breeding grounds now are summer-fallows and cultivation destroys most of their nests. Crows and coyotes also get their eggs and young. Nobody shoots them in B. C.

Hudsonian Curlew (*Numenius hudsonicus* Lath.)—Plentiful all along the Pacific coast. Only pass through B. C. in spring and fall—mostly in May. Nobody shoots them.

Eskimo Curlew (*Numenius borealis* Forse).—The disappearance of this bird like that of the Labrador duck and passenger pigeon will always be an unexplained mystery.

Wood Duck (*Aix sponsa* L.)—Still plentiful where the proper breeding conditions exist. It is bound to disappear from the east where the big timber is cut away and the woodland ponds and streams dry up.

The commonest goose in B. C. is Hutchins goose (*Branta canadensis hutchinsi* Rich.)—Practically all of these pass through between 1st October and 25th November and again from 10th April to 20th May.

Ducks.—Canvas backs, Redheads, and scaups or blue-bills are all increasing in the interior of B. C. where they are good game ducks. This is probably due to the increase of duck weed in the larger lakes. The bulk arrive in from the south late in January in Okanagan and get extraordinarily far. Few are shot in comparison to the thousands that come north.

Up to March 1st the proportion of males to females in all ducks except Mallards is about 3 to 1. In the Mallard the proportion of the sexes is the same the year around. In California and Mexico the females of most ducks are in excess. Mating with most ducks commences about 1st March in our province.

Grouse.—All grouse are practically permanent residents wherever found and should have plenty of protection. Make open season short and bag limit small. First October should be early enough for open season to start. Bag limit eight of any one species per day. They

EDITORIAL NOTE:—The above notes are taken from a valuable letter dated August 19, 1917, which I received from Major Brooks in reply to a request for his opinion on a number of points in connection with the Regulations under the Migratory Birds' Convention Act.—C.G.H.

suffer from the weather and also many parasitic diseases, and greatly from depredations of crows and magpies. In Okanagan these get nearly all the first layings of Prairie chickens, while the herbage is still short.

THE FUR SEALS*

Although the natives of the Aleutian Islands have a tradition that fur-seals once bred there, no fur-seal remains or other facts have been discovered which warrant the belief that they ever came ashore anywhere else in the North Pacific except on the Commander and Pribiloff groups of islands or on a few small islands and reefs in Japanese waters, where they were undisturbed by man, for when discovered all the breeding places of the fur-seals were on islands which showed no evidence of ever having been visited by even aboriginal man.

Both the main groups of breeding islands, although many hundreds of miles apart, are washed by the waters of the warm Japanese Current, and that part of Bering Sea is for several months in the summer almost continually drenched with fog, many weeks sometimes passing without a glimpse of the sun. On these foggy beaches and along the bases of cliffs the fur-seals breed in literally countless thousands, as many as 4,000,000 having been estimated as being on the Pribiloff islands in a single season; indeed Lieut. Maynard, who visited the islands for the U.S. Government in 1872, estimated the total number in that year to be nearly 6,000,000. These figures are greatly overestimated as when actual counts of the seals were made in later years, the numbers were found to be much less than anyone would have believed from simply looking at them, although in 1897, after many years of destructive killing, there were still nearly a million seals on the islands of St. Paul and St. George. Whatever the greatest number may have been at any particular time, the records show that up to 1889 there had been actually shipped no less than 4,439,000 skins of young male fur-seals.

There can be no doubt that with the adequate protection that is now being given the fur-seals, both at sea and on land, they will ultimately increase to their former numbers. In 1914, nearly 300,000 seals were estimated as being on the islands, and the present rate of annual increase is over 15 per cent. This percentage will increase as conditions become more nearly normal.

Following a brief historical statement of the Bering Sea Fur Seal controversy, Mr. Macoun showed an instructive series of lantern

*From a lecture on The Fur-Seals, by Mr. James M. Macoun, C.M.G., before the O.F.N. Club, March 5, 1918.

slides, and gave interesting facts regarding the habits and life-history of the seals.

When the Russians first visited the seal islands descriptive words were coined for animals of the two sexes and various ages. The breeding males were called "old bulls"; the females, "cows"; the non-breeding males, "holluschickie" or bachelors; and the young seals "pups." The old bulls live to a considerable age and attain great size, animals weighing 600 pounds or over being not uncommon. The cows are much smaller, seldom weighing more than 100 pounds. The males reach maturity when six or seven years old, the females the second year. Seals are polygamous animals, each male gathering around him as many females as he can secure. The average size of the harems, as they are called, was in 1914 sixty. As the sexes are born in about equal numbers, it is evident that a very considerable percentage of the male life may be taken without injury to the main herd providing a sufficient surplus is left to furnish scope for the working out of natural selection.

While the fur-seals are born on the land their natural element, of course, is the water and there they spend the greater part of their lives and secure their food. At the present time the fur-seals which go in the summer to the Pribiloff and Commander islands are distributed over the North Pacific Ocean south of the Aleutian Islands, the main body of the so-called American herd living off the coasts of Washington, Vancouver Island and southern Alaska, but even when their numbers were greater not many were seen from ships. The distribution depends chiefly, of course, on the food supply, which is made up chiefly of surface fishes and squid. They have frequently been found as far south as San Francisco. When pelagic sealing was at its height the schooners left Victoria and other ports about the month of March or later, the date of sailing depending upon the willingness of the hunters and boatmen to brave the storms of winter and early spring. As the seals moved north they approached the coast, one of the favorite hunting grounds being just north of Sitka where they were found in large numbers. Following the coast north and west and travelling quickly from one feeding ground to another the first seals reach the Pribiloff Islands towards the end of April, the adult females and older bachelors arrive there early in June, the two-year-olds mainly in July and the yearlings in the latter part of August and September. While on the islands the old bulls do not feed at all. In fact from the day they arrive and take up the station of their choice they neither eat nor drink until they return to the sea in September or later. During this time they not only take part in continual fights but exercise an almost perfect control over their harems, no "cow" being allowed to leave until she has been fertilized. The "cows" do not usually come ashore until they are about to give birth to their

young, which are dependent upon their mothers until the autumn, when they leave the islands with the other seals and fend for themselves. The young fur-seals cannot swim at birth and do not venture into the water until they are a month or six weeks old. As the young male seals do not go on the breeding rookeries but "haul out" by themselves they can be driven to the killing-grounds without disturbing the breeding seals and it is only these young males that are now killed.

REVIEW.

FLORA OF THE ROCKY MOUNTAINS AND ADJACENT PLAINS, containing descriptions of the native and naturalized flowering plants and fernworts, growing in COLORADO, UTAH, WYOMING, IDAHO, MONTANA, SASKATCHEWAN, ALBERTA, and the neighboring parts of NEBRASKA, SOUTH DAKOTA, NORTH DAKOTA and BRITISH COLUMBIA, by P. A. Rydeberg, Ph.D., Curator, New York Botanical Garden. Published by the author. Price \$4.05 post free.

At any time during the last half-century the more eastern American botanists have had a handbook or manual by which they could identify the species they collected, but it was not until quite recent years that western botanists had such helps to the study of plants, and the Canadian botanist resident between Manitoba and British Columbia was until a few months ago without a worth-while book of any kind. Even the professional botanist with access to a good library was never certain that the species before him had not been described or re-described in some obscure periodical or list that was unknown to him. The average amateur botanist could do nothing but send his difficult species to some large herbarium for determination. Dr. Rydeberg's fine book has changed all this and the fact that it was primarily intended for the United States makes it all the more valuable to Canadian botanists. A flora restricted to the species known to occur in Canada would have left the Canadian botanist without descriptions of scores of species which undoubtedly grow in western Canada but have not yet been recorded. Indeed the writer during the short time he has used the book has noted in the herbarium of the Geological Survey several species that had not been separated from closely allied ones, and of course he will find many others.

Dr. Rydeberg has been studying the flora of the Rocky Mountain region for more than twenty-five years both in the field and in the herbarium and in the 1110 pages of his Flora he describes 1038 genera and 5897 species of plants. Keys to families, genera and species, make a study of the descriptions unnecessary in the great majority of

cases and while not attempting to label all the species with English names they are given for all genera and for most of the more widely distributed species.

All Canadian botanists owe a great debt to Dr. Rydberg for having so widened the scope of his flora that few plants will be found in western Canada, east of the Selkirk Mountains and south of the Arctic Circle, that are not described in it, for while he fixed on Lat. 56° as the northern limit of the territory covered by his book this takes the collector north of the prairie country to regions where the ordinary woodland species predominate, and in the Rocky Mountains north of Lat. 56° the flora does not differ greatly from that of the mountains further south except that the number of species is smaller. It was too much to expect that all the species known to occur in Canada between Manitoba and British Columbia should have been credited to the Dominion by one who had to some extent to depend upon others when recording the range of species, but the omissions are surprisingly few and with rare exceptions these species will be found recorded from adjacent Dakota or Montana. Local botanists in Saskatchewan and Alberta cannot do better than compile from Dr. Rydberg's Flora lists of the species recorded there from these provinces, and working from these lists additions should be recorded as found.

The writer regrets, and most Canadian botanists will agree with him, that the nomenclature used by Dr. Rydberg is not that used by Canadian government botanists who follow as closely as possible the so-called Vienna Rules. The names used in Dr. Rydberg's Flora are for the most part those called for by the "American Code" and the names of many of the commonest species will appear strange to those who have been using Gray's Manual, the book upon which most non-professional Canadian botanists, even in the prairie country, depend for the knowledge of Canadian species. Dr. Rydberg has, it is true, included in the synonymy, in most cases, the name by which species should be called under the Vienna Rules but as there is nothing to distinguish such synonyms from others the student who is working without other books must for the time at least adopt Dr. Rydberg's names. Not many Canadian botanists either will care to follow Dr. Rydberg in his sub-divisions of genera but this is more or less a matter of individual judgment and taste. Many who are willing to separate *Pulsatilla* from *Anemone* or *Atragene* from *Clematis* will balk at breaking up *Saxifraga* into eight or more genera or *Habenaria* into five. Just now, however, questions of nomenclature are of minor importance compared with the collection and study of plants and there can be no doubt that the publication of Dr. Rydberg's Flora will give a great impetus to the study of botany in western Canada.

J. M. M.

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