Mrs Arthur Bishop
P. O. Box 1916, Sussex, N. B.
E0E 1P0

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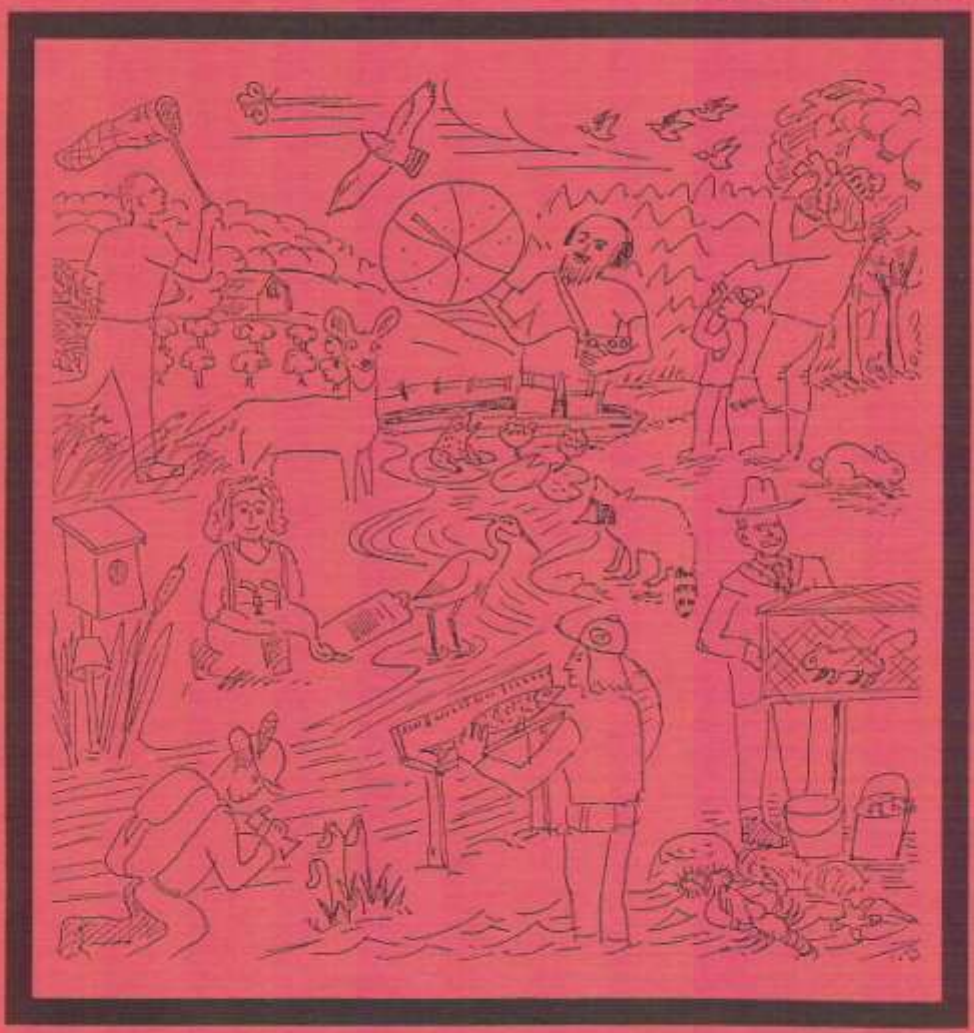

N.B. Naturalist Le Naturaliste du N.-B. 16 (3), June/juin 1988

Cover Illustration
100 years of wildlife conservation in N. B., drawing by K. H. Deichmann

Illustration de la Couverture
100 années de conservation de la nature au N.-B., dessin par K. H. Deichmann

From the Editors

"Wildlife '87—Gaining Momentum" was the theme of a year-long celebration to commemorate past achievements in wildlife conservation, to raise public awareness of current problems, and to launch conservation programs for the next century.

In this issue we take a look at some aspects of wildlife conservation during the last hundred years in Canada and in New Brunswick. In addition to reports on problems facing wildlife—and we include both animals and plants in that term—and on achievements to date, we learn about new programs in biological research, habitat management and education. There are also ideas for projects in which individuals can help wildlife.

While commemorating our national and regional conservation milestones, we should not forget the increasing global threats to our world—both wild and civilized. Solution of those problems is infinitely more difficult—politically and economically—than of those we have faced in the last century.

We hear about global problems often—acid precipitation, reduction of the ozone layer, degradation of the oceans, accelerated climatic change, contamination of air, water and food. Public awareness is a vital first step, for it leads to the resolve and support required for effective remedial action to be taken—action that may require higher taxes, higher prices or the loss of conveniences now taken for granted.

It is often hard to envision that one individual's actions really matter in how we use our resources, handle our waste, approach wildlife, or choose our political representatives. But we are all parents, relatives, or teachers for children who will grow up to have attitudes and make decisions based on the example we have set.

David Christie and Mary Majka

Enchantment

Peter Pearce

It was in the stillness and quiet of an early morning in April as I sat by the roadside observing teal dabbling in a nearby slough. A Song Sparrow, not long arrived from distant parts, darted in to perch in a young elm a few metres away. It seemed unaware of my presence. With overwhelming urge it threw back its head and, throat trembling, burst forth in ringing song. Little clouds of its breath condensed on the cool air, hanging momentarily in the embrace of the strong sunlight. A repeat performance. I stayed motionless, entranced . All seemed right with the world. Suddenly, a slight disturbance in the bushes broke the spell. The bird flew off jerkily to pursue its territorial business at points a little further removed. It had been one of those special moments naturalists experience, to be treasured in the memory. Quite enchanting.

From the President

This piece is written in the rush of spring, a particularly exciting time for naturalists, a reward for having endured another eastern Canadian winter, although even that season has its special facets for those interested in nature. As we gear up for the season afield, we should remind ourselves of the various and significant contributions we can make to the knowledge of the natural history of our fair province. The botanists among us, for example, can enlarge the understanding of the distribution and habitat preferences of our native flora. Bird watchers are exhorted to consider how they can help enterprises such as the Maritimes Breeding Bird Atlas project, now in its middle year, the Maritimes Nest Records Scheme, and breeding bird surveys. All of us can contribute notes of interest, or perhaps important specimens that come our way, to the Natural Sciences Division of the New Brunswick Museum, which deserves our support. The fact that most of us are amateurs means only that we are unpaid, not unsophisticated or without considerable perception.

At the end of May we passed a most important milestone in the history of nature conservation in our province, the inauguration of the Nature Trust of New Brunswick/La fondation pour la protection des sites naturels du Nouveau-Brunswick. Since it was a moment that merits the fullest recognition, I am hopeful that an article can be prepared for the *N. B. Naturalist*—to describe the event itself, to identify the objectives of the Trust, and to suggest how we might help in their attainment. (Each club might perhaps identify as potential native reserves outstanding natural assets on private land.)

The annual general meeting of the Federation will be held at Lamèque during the last weekend of August. Le Club des naturalistes de la Péninsule acadienne nous a gracieusement offrit leur hospitalité. The northeast corner of our province has until recently been largely overlooked by naturalists. It is a quiet and beautifully wild region that may well hold some pleasant surprises for us. It's been said that there's no shore like the North Shore! The AGM weekend is shaping up to be most interesting. Get behind your Federation! Plan to attend! Details will soon be brought to your attention elsewhere.

Your board of directors met at Bathurst on 9 April. The Nepisiquit Naturalists' Club served as a most generous host. Subjects discussed included club news, *N. B. Naturalist*, botanic gardens, a New Brunswick conservation strategy, natural area interpretation, ecological reserves, the Woodstock coyote contest, Caraquet Island, Operation Lifeline, Castalia Marsh, the Fundy "trail", and the Fish and Wildlife Advisory Board. And that's just a start! I thought you would like to know the kind of thing we get up to at these gatherings. Among other activities, I represented the Federation at the annual meeting of the Atlantic Environmental Network, and wrote various letters pertaining to some of the above-mentioned items. All in all, fairly busy.

And so, forward into spring and summer and the many delights in store. Enjoy your natural history pursuits! On vous verra à Lamèque!

Peter Pearce

The Passionate Pioneer[1]

J. A. (Sandy) Burnett

Ottawa. June 8, 1887. Henry Charles Keith Petty-Fitzmaurice, the fifth Marquess of Lansdowne and fifth Governor-General of the Dominion of Canada, gave royal assent to an Order-in-Council:

"... whereas the Minister of the Interior has reported that the islands and shores of the northern end of Long Lake [now Last Mountain Lake], in the North West Territories [now Saskatchewan], are favourite breeding grounds for almost all the different varieties of wildfowl in that country... His Excellency in Council... hereby orders [that] the... lands, which are vacant and unsold, be... reserved from sale and settlement, and set apart as breeding grounds for wild fowl."

The vice-regal signature created the first federal wildlife reserve in North America, an event commemorated in the name of Wildlife '87.

Nowadays, we take wildlife conservation for granted as a normal part of public policy. A century ago, it was not so. The prevailing wisdom of the day viewed North America as an empty continent, ordained to be exploited to the greater glory of commerce and Empire. Action to exclude lands from that destiny was unconventional, to say the least. In fact, no other wildlife reserve would be established by Canada until 1920.

Then how did Last Mountain Lake Wildlife Area come to be? In part, we can thank the Victorian belief that natural science was an appropriate interest for gentlemen. One such gentlemen was Edgar Dewdney, then Lieutenant-Governor of the Northwest Territories, who wrote in March 1887 to Thomas White, Minister of the Interior, noting that unrestricted settlement on the shores of the lake, about a hundred miles northwest of Regina, would endanger a breeding colony of White Pelicans.

Dewdney spoke from experience. Before entering politics he had been a noted explorer and surveyor of the Canadian West. Also, there are grounds to suspect that his plan was supported by another influential explorer, John Macoun, one of the most remarkable naturalists in Canadian history.

John Macoun was born in Ireland in 1831 and emigrated to Upper Canada in 1850. Although he passed his early years in this country as a farm labourer, he possessed an alert mind and a lively curiosity. Before long he had abandoned the plough and, though self-taught, qualified as a schoolmaster. He was eventually appointed professor of natural history at Albert College in Belleville, Ontario. Consumed by an interest in botany, he spent every summer in the field, studying and collecting the native plants of his adopted land, from the Gaspé to Lake Superior.

During one such excursion, in 1871, he encountered Sandford Fleming, chief engineer for the Canadian Pacific Railway, who invited him to join a survey party to the west coast. The botanist accepted willingly. Indeed, he was to spend the next ten years conducting exhaustive studies of the flora, fauna, and geography of western Canada.

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[1] One in a series of articles by free-lance writer and naturalist Sandy Burnett, under the sponsorship of the Canadian Wildlife Service of Environment Canada, to celebrate Wildlife '87, the centennial of wildlife conservation in North America.

In his book *Manitoba and the Great North West* Macoun declared himself an enthusiastic promoter of prairie agricultural development. Yet, it was in that same book that he described in tones of wonder the sight that greeted him in 1879, while camped at the head of Long (Last Mountain) Lake:

"Multitudes of pelicans, geese, ducks, avocets, phalaropes, water hens and grebes, besides innumerable snipe and plover were everywhere, in the marshes at the head of the lake, along its shores, or on sand islands lying to the south of the camp. This was early in July, and experience tells one that not one tenth was then seen of the bird life assembled in September and October."

By 1881, he was appointed staff botanist of the Geological Survey of Canada at the personal wish of Sir John A. MacDonald. In Ottawa he met the Marquess of Lansdowne. With such connections, he was well placed to heartily endorse the merits of Dewdney's proposal for a prairie wildlife refuge.

John Macoun's career as a naturalist and public servant was a long and honourable one, continuing beyond his official retirement in 1912 at the age of 81, until his death in 1920. No stay-at-home bureaucrat, he ventured afield annually to increase his knowledge of Canada's natural heritage, one year to Nova Scotia, another to Vancouver Island, the next to P.E.I. Competence and seniority raised him to the position of Assistant Director of the Geological Survey of Canada. Excellence as a scientist resulted in over 48 new species of wildlife being named for him.

However, it is especially as a courageous spokesman for conservation that we honour him during Wildlife '87. These words are from an address he delivered to the Royal Society of Canada on May 22, 1894.

"We are told that we have immense forests... still untouched, and that generations will pass before we can destroy them all. The same was said of the buffalo, but they are gone never to return. Sixteen years ago they darkened our interior plains in countless thousands, and two years later they had disappeared forever. So will it be with the forests... There is little hope for a change, for viciousness, carelessness, cupidity and supineness of governments and people are responsible for this state of things which will continue until the... destruction of our forests [is] all but completed; then, when the end has come, party parliamentarians will rise in their places and denounce all but themselves for having permitted such senseless and culpable destruction."

Wildlife today stands in greater need than ever of advocates who can so eloquently combine passion with wisdom.

Last Mountain Lake Today

When set aside in 1887, Last Mountain Lake Sanctuary covered 1,013 hectares; it now includes over 15,600 hectares. It was initially reserved for the purpose of protecting nesting grounds. Studies and protective management are ongoing to ensure the survival and enhancement of its wildlife.

LML provides habitat for an extensive variety and number of species. Intervention by means of controlled grazing, burning, and haying; tree and shelter belt plantings; and seeding appropriate nest covering plants has provided nesting places for a variety of species in the upland areas. In the wetland areas Ducks Unlimited has developed new shallow open water wetlands to hold melt water for longer periods. Man-made earthen islands have been placed to provide safe nesting platforms.

Public access to the sanctuary is controlled according to the needs of the inhabitants. Early maturing lure crops are planted to dissuade migratory birds from damaging neighbouring farmers' crops. Hunting is permitted but is subject to control for wildlife management purposes. Visitors are welcome. Displays, pamphlets and other public information materials were developed as part of the anniversary celebrations.

Repaying Our Debt to Wildlife[1]

J.A. (Sandy) Burnett

Probably Canada owes a greater debt to wildlife than any other nation in the world. Long before the beginning of our recorded history an abundance of natural species provided food, clothing and shelter for the native people. Living in a state of ecological harmony with their environment, by and large, they saw themselves as partners and participants in the cycles of nature.

Explorers arrived from Europe to discover a land teeming with wildlife. Thousands of adventurers followed in their wake, seeking fortunes in fish and fur, and opening the wilderness to trade and development. For more than three centuries the great coastal fisheries and the fur trade and forest resources of the interior fueled our colonial economy and laid the foundations of modern Canada.

Our ceremonial emblems acknowledge the historic importance of wildlife to our country. One of the oldest and best known is the beaver, which appeared, appropriately enough, on the corporate seal of the Hudson's Bay Company in 1678. Today, the coats of arms of Canada's provinces and territories bear images of a whole menagerie of native wildlife. In addition to the traditional heraldic lions and unicorns, you can find a beaver, a pronghorn antelope, an elk, a mountain sheep, a bison, two narwhals, an arctic fox, a caribou, a black bear, a moose, three deer and a leaping Atlantic salmon, not to mention a generous variety of trees, weeds and wildflowers.

If symbolic recognition told the entire story, it would be a pretty paltry expression of our gratitude for the resources that built our nation. Fortunately for our consciences and our wildlife, many Canadians have recognized that our obligation runs much deeper. Some have been remarkable individuals: John Macoun, explorer, scientist, and public servant, who catalogued much of Canada's wildlife for the first time, and spoke out passionately for its conservation; Ernest Thompson Seton, outdoorsman, naturalist and writer, on whose philosophy of woodcraft and conservation Lord Baden-Powell based the scouting movement; Jack Miner, zealous protector of waterfowl, promoter of bird sanctuaries, and prophetic forecaster of the risks of industrial pollution; and hundreds more.

Governments, too, have acknowledged Canada's debt. Every province and territory has taken steps to promote the conservation and management of wildlife. At the federal level, several key events deserve mention. As it happens, 1987 marked a special anniversary for each of them.

In 1887, Canada established the Last Mountain Lake bird sanctuary, the first public action in North America for the preservation of wildlife habitat.

In 1917, Canada enacted the Migratory Birds Convention Act which provides authority for regulating the protection and controlled harvesting of waterfowl and other migratory game birds.

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[1] One in a series of articles by free-lance writer and naturalist Sandy Burnett, under the sponsorship of the Canadian Wildlife Service of Environment Canada, to celebrate Wildlife '87, the centennial of wildlife conservation in North America.

In 1947, Canada created the agency now known as the Canadian Wildlife Service and charged it with the administration of federal responsibilities for wildlife.

Important as such acts of public policy are, however, they would be little more than symbolic—like the animals depicted on the various coats of arms—if it were not for dedicated people who give them meaning through their daily work.

What people? There are many, in many walks of life, but let's focus on CWS people in particular. They include biologists, expanding human knowledge by their field studies of wildlife across Canada; laboratory researchers, monitoring the health of the environment for all of us by analyzing the presence of toxins in the tissues of birds and animals; habitat technicians, working to preserve and enhance areas where wildlife can prosper undisturbed by industry or urban sprawl; enforcement officers, combining police work and public education to encourage more and more Canadians to cherish and respect our natural heritage; support staff and administrators, whose attention to detail helps keep the agency's programs running. On behalf of all Canadians, these are some of the people who, day by day, are truly helping to repay our debt to wildlife.

Les effets de la colonisation européenne sur la nature au Nouveau-Brunswick[1]

David Christie[2]

La nature est constamment en train de changer. Divers animaux et diverses plantes varient en abondance et modifient leur distribution en fonction de facteurs naturels tels que les variations climatiques, mais aussi en réaction à l'influence de l'homme.

Lors de l'arrivée des Européens en Amérique du Nord, la région qui est maintenant le Nouveau-Brunswick était dominée par de vastes forêts qui comptaient des arbres énormes. Les Indiens menaient une vie simple et subvenaient à leurs besoins en faisant la chasse et la pêche, et en ramassant des plantes sauvages. Peu nombreux et ne disposant que d'outils primitifs, ils n'eurent qu'une influence minime sur leur milieu.

La vaste forêt n'était découpée que par les ruisseaux, les rivières et les lacs, dont les bords étaient parfois occupés par un camp indien ou un village. Il y avait peu de lieux herbeux; on rencontrait surtout des marécages inondés par les rivières ou les marées et des dunes le long de quelques parties de la côte. Il y avait aussi de nombreuses tourbières. La faune abondait; on rencontrait en grand nombre les mammifères et les oiseaux des forêts, des marais, des estuaires et de la côte; les eaux pullulaient de poissons.

Dès l'arrivée des Européens il se produisit des changements. Disposant de meilleurs outils et de meilleures armes que les Indiens, ils exigèrent davantage du pays, non seulement pour eux-mêmes mais pour les millions de personnes de l'autre côté de l'océan. A titre de commerçants ils se servirent des Indiens pour répondre à la demande de fourrures en Europe. Par la suite, la population grossit rapidement et, en plus de s'occuper de chasse et de pêche, on s'adonna à l'agriculture, à l'exploitation forestière et minière, à l'industrie et au commerce.

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[1] De *Museum Memo*, vol. 7, no. 1, p. 9-13, mars 1975; Le Musée du N.-B., Saint John.
[2] Traduction de Guy L. Cloutier.

Pendant près de quatre siècles de colonisation européenne, l'homme a influencé la vie animale et végétale du Nouveau-Brunswick de quatre façons principales:

a. chasse, pêche, récoltes forestières
b. changement d'habitats
c. introduction de nouvelles espèces
d. pollution de l'environnement

Parfois ces changements ont été davantage l'effet de l'une de ces influences en particulier agissant ailleurs plutôt que dans la région locale. Il est souvent difficile d'établir un rapport entre un changement observé et la cause profonde dont il découle, que celle-ci soit d'origine humaine ou autre, étant donné que très souvent plusieurs facteurs conjugués entrent en jeu. Tout aussi déroutantes (lorsqu'on tente d'évaluer "l'impact" de l'homme sur son milieu) sont les relations parfois exagérées, confuses et contradictoires, des premiers écrivains auxquels on doit s'en remettre pour ce qui est de l'information sur la faune et la flore d'il y a cent ans ou plus.

Les effets d'une chasse effrénée aboutissant à la réduction de la population des bêtes sauvages et dans certains cas à la disparition de l'espèce, se sont faits sentir d'une façon aiguë chez les mammifères, les oiseaux et les poissons dont la chair ou la fourrure étaient estimées, ainsi que chez les prédateurs dans lesquels l'homme voyait un ennemi ou un rival. La chasse excessive fut donc l'un des premiers problèmes de conservation. Une loi visant a protéger l'Orignal fut passée par la première législature provinciale en 1786, mais elle devait s'avérer inefficace. C'est seulement depuis 1900 que des progrès sensibles ont été faits dans le contrôle du braconnage.

Le Grand Pingouin (qui ne vole pas) fut la première de nos créatures à disparaître suite à la présence de l'homme. On les massacra afin de se procurer les plumes et l'huile. La dernière mention remonte en 1844 en Islande; de fait, il avait disparu beaucoup plus tôt de son lieu d'hivernage dans la baie de Fundy où sa présence ne nous est connue que grâce à des os trouvés dans les fosses à purin des Indiens.

Des espèces moins faibles ont aussi été exterminées ou ne fréquentent plus cette partie de leur aire. La chasse aidée par le défrichement des grandes forêts d'arbres feuillus mit fin aux immenses volées de Tourtes, une des grandes merveilles de ce continent. La dernière Tourte mentionnée au Nouveau-Brunswick remonte à 1899; peu après l'espèce était éteinte. Les circonstances dans lesquelles le Canard du Labrador est disparu nous sont inconnues (la dernière mention remonte à 1871 au Nouveau-Brunswick).

Parmi les mammifères, le Morse, autrefois commun dans l'est du Nouveau-Brunswick, disparut de nos rivages vers la fin du XVIII^{e} siècle par suite d'une chasse outrée. Le Glouton (le carcajou), un prédateur détesté dont la fourrure était assez estimée, semble avoir disparu au Nouveau-Brunswick au début de XIX^{e} siècle. Aussi détesté, le Loup gris fut vu pour la dernière fois dans la province vers les 1900. Le Vison de mer, peu connu, est disparu à peu près à la même époque.

Bien d'autres mammifères et d'autres oiseaux ont vu leurs nombres réduits par la chasse. Le Castor, l'Orignal, la Loutre, la Martre, le Pékan, ainsi qu'un grand nombre de canards et d'oiseaux du littoral, ont aussi connu une baisse; ils se sont cependant plus ou moins remis grâce à la mise en oeuvre de règlements plus efficaces dans le domaine de la chasse. L'établissement de refuges a grandement favorisé le retour de nombreux oiseaux aquatiques; mais les animaux n'ont pas tous été aussi chanceux. La disparition du Courlis esquimau reste toujours imminente; le Phoque du Groenland, un grand nombre de baleines et de poissons d'une grande importance commercial sont actuellement, quant à la population, à leur niveau le plus bas.

L'influence de l'homme a été grande sur la végétation au Nouveau-Brunswick: les incendies de forêts, l'exploitation forestière et les nouveaux modes d'exploitation des terres ont tous apporté des changements au milieu. Quelques plantes rares a probablement été exterminés[1] dans la province, les habitats où elles possaient ayant été transformés par l'homme. En général les espèces typiques des forêts arrivées à maturités et non touchées par l'homme ont diminué, tandis que les espèces que l'on voit prospérer dans les forêts dérangées, ainsi que les espèces de la campagne telles que les herbes, les asters et les verges d'or se sont multipliées.

Les grands changements qu'a subi la végétation ont naturellement influé sur la vie animale. Il existe un rapport entre la population du Cerf de Virginie qui a décuplé depuis le milieu du XIX^{e} siècle et la régénération des terres boisées qui avaient été brûlées ou exploitées: l'abondance de végétation jeune offre d'amples provisions de bois pour le cerf pendant l'hiver. Il se peut que la hausse dans la population du Couguar soit une conséquence de l'abondance soutenue du cerf. La disparition du Caribou du Nouveau-Brunswick peu après 1900 n'est peut-être pas sans rapports avec les maladies et les parasites propagés par le cerf. Le Lynx roux a lui aussi été favorisé par des changements dans les habitats, alors que le Lynx du Canada, incapable de lui faire concurrence, est devenu extrêmement rare.

Parmi les oiseaux, les grands oiseaux rapace, ainsi le Grand Pic[2], ont peut-être été touchés par la baisse en grands arbres sur lesquels ils dépendent pour nicher. L'édification d'un phare sur Gannet Rock a forcé les Fous de Bassan à quitter la seule colonie de couvaison qu'ils aient au Nouveau-Brunswick.

Dans leurs nouveaux habitats—régions herbeuses et couvertes d'arbustes—plusieurs animaux se sont multipliés de façon notable: le Campagnol des champs, la Marmotte, le Merle d'Amérique, le Goglu, le Pinson des prés, la Couleuvre rayée, le Crapaud américain et les sauterelles. Et d'autres se sont déplacés plus à l'est, au delà des prairies, pour aller habiter des régions autrefois inhospitalières. C'est ainsi que le Pluvier kildir, le Vacher à tête brune et le Papillon du céleri se sont établis ici et que le Coyote commence de paraître dans la province[3].

Les populations de Goélands argentés et de Goélands à manteau noir se sont accrues considérablement grâce à la source substantielle de provisions qu'ils tirent des dépotoirs et des conserveries durant l'hiver. L'accroissement de goélands a eu un effet néfaste sur les colonies nicheuses de sternes, ainsi que sur d'autres oiseaux de mer, parce que le goéland fait sa proie des oeufs et des oisillons pendant l'été. Les gravières et les édifices de l'homme, comme les maisonnettes d'oiseaux, ont été d'un grand secours aux hirondelles qui les emploient volontiers pour y nicher. De façon semblable, les gens qui ont pris l'habitude de donner à manger aux oiseaux ont permis à certaines espèces d'étendre plus au nord leur aire de distribution pendant la saison d'hiver.

L'homme, par ses voyages, a introduit de nombreuses espèces de plantes et d'animaux dans des régions nouvelles où, une fois établies, elles ont pu avoir une grande influence sur les populations indigènes. Environ 20% de la flore du Nouveau-Brunswick vient de d'autres parties du monde. Plusieurs des plantes qui poussent dans les champs et sur le bord des routes ne sont pas indigènes, comme la Phléole des prés (Mil), la Renoncule âcre (Bouton d'or), les trèfles, la

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[1] *Goodyera pubescens, Desmodium glutinosum, Solidago caesia* et *S. ptarmicoides*, par exemple. La Langue-du-cerf, *Asplenium scolopendrium*, originairement nommé dans cet article, n'est plus considérée indigène au Nouveau-Brunswick (Hinds 1986. *The Flora of New Brunswick*, p. 14).

[2] Pendant les années 1980, le Grand Pic est plus nombreux, peut-être a cause de beaucoup grands ormes tués par la maladie de l'orme subéreux.

[3] Et bientôt bien établi.

Marguerite et le Pissenlit, par exemple. Plusieurs maladies des arbres ont aussi été introduites. L'Orme d'Amérique succombe lentement sous les effets de la maladie de l'orme subéreux, un mycète asiatique introduit en Amérique du Nord en 1930. La rouille vésiculeuse du pin blanc et la maladie corticale du hêtre, deux mycètes d'origine européenne, n'ont pas une influence aussi néfaste, mais elles déforment les arbres et les rendent plus vulnérables aux autres organismes.

La plupart des insectes qui ont été introduits sont rattachés aux habitations et aux récoltes de l'homme. C'est ainsi que nous avons du Monde ancien des espèces telles que la Punaise des lits, la Mite et la Piéride du chou, cette dernière ayant remplacé en grande partie l'espèce indigène qui lui est étroitement apparentée, *Pieris napi*. Ce sont là des insectes indésirables, mais récemment on a délibérément introduit le papillon *Tyria jacobea* dans l'espoir que celui-ci aidera à contrôler le Séneçon de Saint-Jacques, une mauvaise herbe d'origine européenne vénéneuse pour le bétail.

Parmi les animaux introduits ici les vers de terres sont sans aucun doute les plus utiles. Toutes les espèce indigènes ont été exterminées ici pendant l'ère glaciale. Les espèces exotiques sont à peu près absentes de la mer, bien que l'activité de l'homme ait possiblement permis au Bigorneau comestible d'atteindre jusqu'à la baie de Fundy et de se répandre plus au sud entre 1860 et 1880. Autrefois on ne le rencontrait que dans le golfe du Saint-Laurent et sur le littoral atlantique de la Nouvelle-Écosse.

Des animaux supérieurs introduits au Nouveau-Brunswick, le Rat surmulot, la Souris commune, le Pigeon biset, le Moineau domestique et l'Étourneau sansonnet sont importants mais on les associe surtout aux fermes et aux villes. Les deux derniers font une sérieuse concurrence aux oiseaux indigènes, surtout les hirondelles et le Merle bleu à poitrine rouge, pour les trous propres à la nidification. Le gibier d'eau et le gibier à plume que l'on a introduits ici, comme le Faisan à collier, la Truite arc-en-ciel, l'Achigan à petite bouche et le Brochet maillé, ne sont établis que dans certaines petites parties de la province.

Nous somme enclins à considérer la pollution de l'environnement comme un phénomème récent. Il existe pourtant depuis bon nombre d'années. Les déchets d'égouts posèrent un problème dès que se formèrent les petites villes; les premières industries avaient des déchets, dont la sciure de bois, que l'on jetait souvent dans les cours d'eau; la houille tendre que l'on brûlait dans les poêles au XIX^{e} siècle polluaient beaucoup l'air. Aujourd'hui les problèmes causés par la pollution se sont multipliés et ont pris de l'ampleur suite à l'accroisement démographique, à la "diversification" de l'industrie, à l'emploi des engrais chimiques et des insecticides et à l'usage répandu de l'automobile. Les animaux le plus gravement atteints sonts les grands oiseaux de proie, surtout l'Aigle à tête blanche et le Faucon pèlerin dont le système reproductif a subi les effets néfastes de résidus d'hydrocarbure chloruré provenant de l'usage d'insecticides.

Au Nouveau-Brunswick l'homme a modifié la nature de multiples façons, parfois intentionellement, parfois à son insu. Plusieurs espèces ont disparu et beaucoup ont été acquises. Des habitats riches et fertiles ont été détruits ou endommagés; d'autres par contre, ont été créés. Dans l'ensemble, il y a eu une grande "diversification". Que nous réserve l'avenir? Les tendances actuelles de croissance et d'exploitation incitent à croire que l'on ira probablement vers une plus grande simplification, ce qui veut dire que la nature en tirera plus de désavantages que d'avantages.

Rare New Brunswick Plants

Rare Plant Conservation in New Brunswick

Hal Hinds

There are several ways in which rare plants are protected in New Brunswick; through legislation, through education, through property restrictions, through inaccessibility and through national and provincial park designations.

In New Brunswick there are two acts of law which may be used to protect and preserve rare plants, the Endangered Species Act and the Ecological Reserves Act. The former protects both the species and its habitat, the latter is concerned with special habitats which might harbour rare plants. The Furbish Lousewort, a figwort occurring only on the upper St. John River in New Brunswick and Maine, is the only plant protected by the Endangered Species Act. The Ecological Reserves Act presently does not protect any rare plants but several proposed reserves, such as the Wilson Brook gypsum cliffs and Miscou Island's Grande Plaine, do harbour rare plants.

As more and more people become informed about the importance of unspoiled areas and rare plants through school, conservation organizations, books or the mass media, they will be more supportive of efforts to conserve our rare plant heritage. It is generally believed that is against the law to pick such wildflowers as trilliums and wild orchids. This perhaps originates from our elementary school teachers but has no basis in fact. It is one of those hearsay beliefs that perhaps we should not completely refute. Many of our conspicuous wildflowers could use some relief from wildflower bouquet picking pressure.

It is also possible to protect rare plants on private or public property by restrictive access. This can be done by land owners posting their private property or by organizations which acquire the rights to protect special features. Land can be purchased outright or may be leased or a special contract may be entered upon with the landowner. The Nature Trust of New Brunswick which was incorporated to protect and preserve natural areas may do so by any of these means. Presently the Trust has negotiated a special lease arrangement with Fraser Inc. for a property that shelters a large diversity of wild orchids and a ridge of mature hemlocks at Shea Lake, near Plaster Rock.

There are several rare plants that occur in mostly inaccessible habitats such as precipitous cliffs, barrier beaches and islands. They are afforded some degree of protection by virtue of the difficulty of reaching the sites or the remoteness or the impossibility of developing the site. It is important, however, to watch these areas carefully if they have no other means of protection in case of inadvertent damage by man.

Certain rare plants are protected in Kouchibouguac and Fundy National Parks and also in some of the provincial parks. Park administrators are anxious to know what interesting forms of life occur within their boundaries and are usually cooperative in avoiding undue damage to rare plants.

Most of the rare plant sites documented in the "Rare Vascular Plants of New Brunswick" (Hinds, 1983, *Syllogeus* No. 50) National Museum of Natural Sciences) have no special protection. Many rare plant sites famous for the number and variety of rare species have been destroyed in the past. These include such areas as Reversing Falls cliffs, Spragues Falls area, Bull Island near Woodstock, Aroostook Gorge, mouth of the Mactaquac River and Sisson Gorge. If we are not to lose more of our plant heritage we must continue to document the occurrence of rare plants in the province and work to provide some means of stewardship for rare plant habitats.

Seventy Years of Bird Protection[1]

Anthony J. Erskine

The public, including Nova Scotia Bird Society [N.B.F.N.] members, assumes that all or nearly all birds are legally protected, except during the hunting seasons for game species. That kind of broad statement is more or less correct, but when more detail is sought the picture gets complicated, or even confusing. Migratory birds are protected under federal regulations, and other birds by the Province—but some birds that migrate are not counted as migratory birds, and so on. The editor of *Nova Scotia Birds* [*N.B. Naturalist/Le Naturaliste du N.-B.*] asked for an outline of the legal basis for bird protection in Canada, to reduce the confusion and frustration occasioned by the divided jurisdictions of government agencies.

Wildlife conservation in general is a provincial responsibility under the British North America Act (1867), which left to the provinces most subjects not specifically designated as federal concerns. Birds received little protection from hunting and commercial exploitation under provincial laws in the next 50 years, and numbers of some species were greatly reduced. Public awareness of this overexploitation led in 1916 to the Migratory Birds Convention (hereafter "the Convention," called Migratory Birds Treaty in the USA) between the United States and Great Britain (on behalf of Canada). As an "empire treaty" which took precedence over provincial laws, this Convention and the Act (M.B.C. Act 1917) that put it into effect transferred to federal jurisdiction specified groups of birds that were considered useful to man or harmless. The Migratory Birds Convention is still the principal basis for federal involvement in bird protection in Canada, and the Canadian Wildlife Service (CWS) evolved out of the needs for enforcement of regulations under the M.B.C. Act and for information to guide the conservation of migratory birds. The Convention has led to general success in halting commercial exploitation and in regulating sport hunting, which were its two main thrusts. Difficulties have arisen, repeatedly, because amendments to the Convention are possible only with the concurrence of all the provincial and territorial governments. That unanimity is essentially impossible to obtain, so the Convention still stands with the strengths and weaknesses that were built into it originally. The United States subsequently signed treaties with Mexico, Japan, and the Soviet Union, covering all birds rather than only a selection and avoiding the pitfalls built into the 1916 Convention. Canada has not been able to do this, and the new Constitution would have to be amended to make it possible, so no early resolution of the impasse is foreseen. Some piecemeal remedies are being explored, including a Protocol to allow regulated subsistence hunting by native people in northern areas where migratory birds are present only during the summer months, which were defined as a permanently closed season in the Convention.

Species seen under the Convention as being useful included game birds, except for grouse, partridges, and pheasants (which were obviously non-migratory), and insectivorous birds, excepting obvious "pest" species such as starlings, blackbirds, and the House Sparrow. Harmless species included the other families of water birds not considered as game birds, thus loons, grebes, tubenoses, gannets, herons and bitterns, jaegers, gulls and terns, and alcids. The provinces were left to regulate, besides resident game birds, the various species that were seen as competing with man in some way, thus: 1. fish-eating birds, including pelicans, cormorants, and kingfishers (but not mergansers, which were placed with the other ducks as migratory game birds); 2. predators that were thought to feed on game birds or insectivorous birds, or on their eggs or nestlings, including all the raptors (hawks, eagles, falcons, osprey) and owls, and all the Corvidae (crows,

[1] Originally published in *Nova Scotia Birds* (vol. 28, no. 2, April 1986). Most of its content applies in New Brunswick as well as in Nova Scotia. Variations arising from differences in provincial legislation are inserted in square brackets.

ravens, jays); and 3. the grain-eating passerine pests mentioned earlier (not including the colourful members of the Icteridae—Bobolink, meadowlarks, orioles). Interpretation of what birds are insectivorous ("good") rather than seed (grain)-eating ("bad") has changed gradually. Nearly all song birds feed insects to their young, and most of the seeds eaten by the North American "sparrows" (Emberizinae) are of no commercial value; at one time only the Chipping Sparrow was counted as insectivorous, but now that whole (sub-) family is covered by the Convention.

Species classed as game birds also are protected except during officially declared hunting seasons. If no season is declared, a species is protected at all times, even if it is designated as a game bird. The Whooping Crane and Eskimo Curlew, both endangered species, are examples of game birds under federal jurisdiction which have not had a hunting season declared since 1916. Ptarmigan and Spruce Grouse are game birds fully protected under provincial regulations in Nova Scotia, although both are hunted in other provinces. No open seasons were declared on Wood Duck and Common Eider, singled out in the Convention as in need of special protection, for many years after 1916; as their numbers increased, seasons were again opened on these birds, but in Nova Scotia there are still restricted bag limits (one/day) on Wood Ducks—to discourage hunters from discarding birds shot by mistake rather than from any intent to encourage the hunting of Wood Ducks. The old hunters who remembered shooting shorebirds prior to 1916 were still agitating for open seasons on Black-bellied Plover and yellowlegs as late as 1950, but shorebird hunting has been restricted for many years to the two "sporting" species, Woodcock and Common Snipe. [In New Brunswick, all wildlife species, including all birds, are protected at all times except during a formally declared hunting season. Certain species of "nuisance wildlife" may be killed under permit, either in restricted situations or more generally, e.g. crows, under a General Hunting Licence. Wood Ducks in New Brunswick are treated in the same way as other sport ducks.]

Introduced species present anomalies. Release (to establish a huntable stock) of Giant Canada Geese from eggs collected in Ontario, is regulated under federal permits, although carried out by the provincial wildlife agency [in N.S.]. Releases of Pheasants (for hunting) and Gray Partridges are a provincial responsibility, even when carried out by private citizens. The Willow Ptarmigan (game bird, i.e. "good") introduced by the provincial agency on Scatari Island [N.S.] and the Peregrine Falcons (raptors, i.,e. "bad") reintroduced by the CWS at Cape d'Or [N.S.] are both strictly protected at all times. The European Starling and House (English) Sparrow, not covered by the Convention, are also named as excluded from protection under provincial regulations. The Rock Dove (feral pigeon) is not mentioned either by federal or provincial regulations, and municipal governments of cities and towns plagued by these birds are left to devise their own solutions. [The European Starling, House Sparrow and Rock Dove (feral pigeon) are all protected in New Brunswick, although they all might be killed under permit in specific "nuisance wildlife" situations.]

Protection by laws is one thing; enforcement of laws is another. The Migratory Birds Regulations are quite explicit about restrictions on when, where, and by what means people may hunt particular species. They are less clear—and thus subject to varying interpretations—as to what constitutes disturbance to birds. Most people assume that such prohibitions are more explicit and clear-cut than is actually the case. For example, a person standing quietly in the middle of a tern colony, among nests containing eggs or small young, on a cold and drizzly day, may be causing substantially reduced reproduction by those birds; yet a judge easily could conclude that such presence did not constitute action to "disturb... a nest (or) egg... of migratory bird" (Section 6) nor to "harass (one of several actions encompassed by the word "hunt" (Section 2 (1)) a migratory bird" and thus subject to hunting restrictions. Often it would be necessary to demonstrate that such a person intended to cause disturbance or harassment by his or her presence in the colony, in order to secure a conviction. If an area were conspicuously posted as a bird sanctuary or nesting area, an

intruder might reasonably be expected to interpret that agitated birds protesting his or her presence were responding to disturbance to them; but without such signage to identify an area as sensitive, even experienced birders do not always recognize what kinds of behaviour in what time-periods constitute breeding evidence (hence the need for instructing participants in the Breeding Bird Atlas project).

If a Bird Society [federation] member sees actions that could be harmful to birds, or finds evidence of such actions having occurred recently, several alternatives are available. If "harmless trespass" seems to be the problem, a polite personal approach to the individuals involved may be the best solution; this allows information to be given in a suitable context, and may encourage interest in birds by previously ignorant people. Warnings of possible charges would follow only if an abusive or other negative response resulted. If the violators were armed or inebriated, a personal approach would be at your own risk, and detailed note-taking would be safer. Obtaining the description and license-plate number of a vehicle may allow enforcement personnel to issue a stern warning to the persons responsible, and this is all that will be possible in most cases where a violator was not apprehended in the illegal act. The more detail delivered to enforcement people, the more possible their follow-up, and the effect also is cumulative; as a picture of repeated violations in an area or of a particular type is built up, the probability of enforcement effort being focussed there increases. Notwithstanding the divided jurisdictions of the various levels of government, many enforcement personnel are empowered to act on violations of both federal and provincial regulations for the protection of birds. A Canadian Wildlife Service enforcement coordinator is stationed in Bridgewater [N.S.] and another in Sackville, N.B., but most information on violations will be delivered to detachments of the Royal Canadian Mounted Police or to conservation officers of the provincial Department of Lands and Forests [Natural Resources]. Officers of the Federal Department of Fisheries and Oceans Protection Service often are licensed as migratory bird officers, and they may be prepared to relay messages or to advise where other enforcement people may be contacted. Within the limits of a city or town, the municipal police would be the first point of contact regarding any kind of violations.

Despite all this discussion of violations and divided jurisdictions, the story of bird conservation in eastern Canada is not all gloom and doom. Compared to the situation in 1916—as far as that can be reconstructed, bird protection under the Migratory Birds Convention is a success story. Many species whose numbers had been greatly reduced by unregulated exploitation have recovered very well, even though sport hunting is practiced more widely than ever before; also bird-watching and bird feeding attract people on a scale that would have been inconceivable to our grandparents. These are direct and indirect results of the protection afforded birds through the Convention. Conservation processes are often slow, as traditions of exploitation persist long after the direct subsistence needs that started them have ceased to apply. Furthermore, new problems influencing bird numbers emerge, for which the old regulatory measures may not be appropriate so that new ones have to be devised. Example of present problems not foreseen by the people who drafted the Convention are the widespread dissemination of toxic substances such as biocides or oil spilled at sea, and the imbalance to marine bird communities caused by gull populations burgeoning on man's garbage. Given the continuing concern of informed citizens, and their insistence on enough controls to allow time to work out solutions, I believe that the next seventy years will show advances in bird protection as striking as those of the years just past.

The Bald Eagle in New Brunswick

Rudy Stocek

Decades ago the Bald Eagle appeared to be on a spiral to oblivion in parts of North America. A number of contributing factors were responsible for this demise, namely the widespread use of pesticides (especially DDT), habitat deterioration and loss through human activities and shooting of the birds.

Was the eagle in New Brunswick on the same downhill slide? That question provided the impetus that started my work on this species in 1974. The past 14 years of research have answered some of the questions regarding the status of the eagle in the province, its habitat requirements and the impact of human activities on its well-being.

The Bald Eagle was never a common breeding bird in the province in the past. Generally, where it had nested in earlier times it is still nesting now. Breeding has always been scarce in eastern New Brunswick as it is today. The northern part of the province including the Miramichi drainage now has little if any nesting activity even though the birds are occasionally seen throughout that area all summer. Earlier reports had suggested that there were a few nesting pairs there. There were about 15 pairs of eagles nesting in 1974; this had increased to about 20 in 1980 and now, in 1988, the number in the province is approaching 35. Most are found in York and Charlotte counties west of the Saint John River. There are also two in Sunbury County and one each in Carleton, Queens, Kings, Albert, Saint John and Kent counties. Breeding success seems to have increased somewhat in the last 14 years to where eagles are now producing an annual average of one young per occupied site or better. A high 85% of the nests were successful in 1987.

The summer population of eagles, which includes breeders and non-breeders, adults and subadults (immatures), appeared to have decreased in numbers since the mid-1950s when an estimated 100 birds (mostly immatures) frequented the lower Saint John River Valley. This decrease may have been a result, in part, of fewer eagles of the southern subspecies summering in the province. Today more eagles are seen during the summer but still less than recorded in years past.

Wintering birds are found most often along the Bay of Fundy coastline, the marine islands and the lower reaches of major river systems. They probably number between three and four dozen and appear to be holding steady or perhaps even increasing slightly.

Characterizing eagle breeding habitat is difficult since these birds utilize a wide variety of habitat types and components. There are, however, common threads to be found in this patchwork quilt. Eagles almost always nest near water, mostly on lakes in the province, but also on rivers, estuaries and marine islands in about equal proportions. A large diameter tree, dominant, live and often with a dead or broken top is usually selected as the nest site. Thirteen species of hardwoods and three of softwoods have been used. Even though the species is not that critical, half of all the nests have been placed in Eastern White Pine because of its size and branch whorl conformation. Maples (Red and Sugar) are the most used hardwoods. In spite of the media image we usually get of eagles nesting in tall trees, high above the forest canopy, this is not usually the case in New Brunswick. Over two-thirds of the woodland nests are located at or below the mean canopy level of the stand. The great majority of the nests are built on the top of the tree rather than situated on lower branches next to the main trunk.

While many breeding areas are located in more remote parts of the province, there are those that are just as successful found near human habitation. This then brings up the problems posed by

human impacts on the eagles. Habitat loss, change or alteration due to forest operations, road building, marsh drainage and lake drawdown need to be continually monitored if occurring near eagle breeding areas. Each has had some influence on eagle nesting in the province. Shooting of the birds still continues but to a lesser degree than in the past. The fact that the Bald Eagle is on the provincial endangered species list has increased public awareness of this bird and its relatively small numbers. It should remain on that list. The implementation of site management plans for the eagle by the provincial government is a testimony to the concern for this majestic raptor and to the desire to keep it flying in New Brunswick skies.

Nepisiguit Salmon Association

Robert Baker

The Nepisiguit Salmon Association was formed in 1976 by a small group of local anglers in an attempt to rebuild salmon stocks on the Nepisiguit River.

In 1981, encouraged by the Department of Fisheries and Oceans, the NSA initiated its own enhancement program on the Nepisiguit. From 1981 to 1987, over three million juvenile salmon were stocked in the river. Originally from early-run Miramichi and Restigouche salmon, they are now derived from Nepisiguit salmon, collected at the counting fence and held at Charlo Fish Culture Station.

In 1981, only 312 grilse and salmon were processed at the counting fence seven miles above the mouth of the river. In 1987 a total of 3134 (1382 salmon, 1752 grilse) were processed. In 1981, total estimated spawning escapement was 10% of requirement. In 1987 it was 65%.

The average angling catch between 1959 and 1968 was 500 fish per year. From 1969 to 1973 it was less than 150 fish annually. From 1980 to 1987 the average catch has been 973, with a high in 1987 of 1850 fish (including 550 released grilse and 500 released salmon). This is certainly graphic proof of the success of enhancement efforts.

The association has been involved with Noranda Research in pioneering studies on streamside incubation boxes for salmon. Hatch rates have been over 97% to date, thus proving a valuable aid available to enhancement of both salmon and trout .

The NSA played an important role in the banding together of salmon conservation groups in the province to form a group which evolved into the New Brunswick Council of the Atlantic Salmon Federation, the first of six such councils to be formed in North America.

Announcements!

"The Natural Beauty of Mactaquac Park", a seven-minute video show (BETA or VHS), is available in French or English. Rental is free except for the payment of return postage. Contact Dr. Warren Coleman, Mactaquac Heights, N.B.

Loon Information Wanted: 1988 is the second year of my research on Common Loons in New Brunswick (sponsored World Wildlife Fund). I am interested in knowing how many loons there are, where they breed, how successful they are at it, and what is affecting their numbers. I need volunteers to visit lakes anywhere in the province, preferably in July. Please send me any loon information you have, including name of the lake, date of your visit, and number of adults (even if none) and chicks seen. Rudy Stocek, Maritime Forest Ranger School, RR 10, Fredericton, N.B. E3B 6H6; tel. 458-0199

Operation Lifeline in New Brunswick

Tim Beatty

What does "endangered" mean? What are Canada's endangered and threatened species? Why are they endangered? Why should we care? What is being done? What can our class do? These are the six questions posed to New Brunswick students and their teachers at the beginning of the six units in Operation Lifeline.

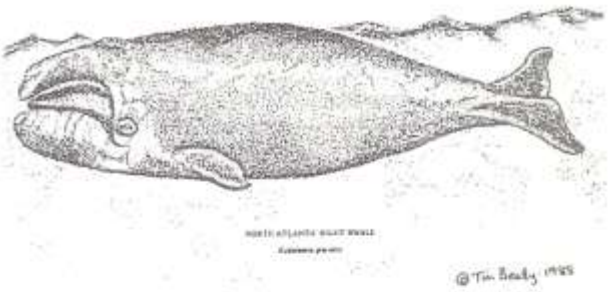
Operation Lifeline is an educational programme offered by the World Wildlife Fund (WWF) and is designed to teach students about Canada's endangered species.

Each of the six units within the programme contains exercises that can be taught in mathematics, geography, research skills, science, drama, physical education, etc. This allows the elementary teacher to integrate the programme into his/her daily routine. Time schedules and curricula are suggested in the teacher's guide but teachers are encouraged to take their students through the programme at the pace the class sets.

In New Brunswick the programme was piloted by WWF and Sunbury Shores Arts and Nature Centre two years ago. Since then over 200 New Brunswick teachers and their classes have joined the Lifeline.

The idea behind the programme is to get students in New Brunswick to learn about or help the Right Whale or the Piping Plover, students in Quebec to help the St. Lawrence Belugas, students in Manitoba to help the Burrowing Owl, and so on across the country. This forms the Lifeline of students for Canada's endangered species.

The programme has caught on like wild fire. Last year several classes from the St. Stephen area adopted the Right Whale as their endangered species. They developed and sold buttons declaring that they wanted to "Save Our Endangered Whale." A total of $434.00 was raised and the money was donated to the Grand Manan Whale and Seabird Research Station for Right Whale research. That project is running again this year.



On New Brunswick's North Shore, a York University student, Roland Chiasson, is developing a public education programme on the Piping Plover as an appendix to Operation Lifeline. The programme, beginning this year , has been developed under the guidance of Kathleen Blanchard, the Quebec-Labrador Foundation, and the World Wildlife Fund. Roland has already initiated some classes and will hopefully be developing summer camps where the students can actually participate in plover research.

Since last summer the Canadian Nature Federation has been a full partner in the Operation Lifeline initiative. If you would like to become involved in the Lifeline classes in your area please do not hesitate to call or write me, Tim Beatty, c/o Sunbury Shores Arts & Nature Centre, P. O. Box 100, St. Andrews, N. B. E0G 2X0, or call (506) 529-3386.

If a Bird Falls in the Forest[1]

J. A. (Sandy) Burnett

The next time you get a chance, look closely at a spider's web. The classic orb of radiating spokes linked by a spiral of sticky thread is a marvel of natural engineering. No matter what part of the delicate tracery an intruder may brush against, the vibrations of its touch are transmitted to every corner of the web.

The spider's web illustrates a basic principle of nature. Everything interconnects. Even seemingly insignificant events have far-reaching consequence. It is a principle to keep in mind whenever humans propose to alter natural systems in pursuit of economic gain.

Aerial spraying of forest pesticides in Atlantic Canada is a long-standing and controversial example of such intervention. It was tried for the first time in 1927 in Nova Scotia, but it is New Brunswick's spray program against the spruce budworm, continuous since 1952, and the more recent campaign in Newfoundland against the hemlock looper, which have sent vibrations to every corner of the forest ecosystem.

The rationale for forest pesticide spraying is clear. Certain insects, such as the spruce budworm and the hemlock looper, can cause severe damage to timber and pulpwood during periods when their population cycles reach a natural peak. In times past, woodlot owners simply had to accept lower yields of the affected tree species for a season or two, until natural predators and diseases brought the insect hordes under control. In natural stands of mixed forest, this was ordinarily not a serious hardship. However, such laissez-faire practices are ill-suited to the demand for dependable supplies of wood and steady cash flow expressed by the modern corporate giants of the forest industry. When a severe budworm infestation broke out in New Brunswick in the 1950s, their influence, coupled with an unquestioning faith that technology could solve every problem, led to extensive forest spraying with DDT.

The results were little short of disastrous. Salmon stocks in the Miramichi and the Restigouche river systems were severely reduced. Peregrine Falcons were wiped out and Ospreys were seriously threatened as a result of DDT-induced eggshell thinning. A second pesticide, phosphamidon, introduced as a less dangerous chemical than DDT, caused extensive mortality to songbirds. Other chemicals followed; yet, despite a costly thirty-five year campaign, budworm damage to the forests was only lessened, not eliminated.

At present, the most intensively used chemical insecticide in New Brunswick's battle against the spruce budworm, and the only one registered for use against the hemlock looper in Newfoundland, is a compound called fenitrothion. This substance, when applied within strictly limited margins of error, is deemed to be environmentally safe. However, if those limits are surpassed even to a moderate degree environmental problems will follow.

The Canadian Wildlife Service of Environment Canada is specifically directed by the Migratory Birds Act to see that "no person shall deposit or permit to be deposited oil... or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds."In this context, acting in an advisory capacity to provincial and federal agencies, it conducts research into the effects on migratory birds of new and in-use pesticides, and monitors ongoing spray programs.

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[1] One in a series of articles by freelance writer and naturalist Sandy Burnett, under the sponsorship of the Canadian Wildlife Service of Environment Canada, to celebrate Wildlife '87, the centennial of wildlife conservation in North America.

Current research by Fredericton-based Canadian Wildlife Service biologists Peter Pearce and Dan Busby indicates that an application of as little as twice the recommended quantity of fenitrothion can kill songbirds. Non-lethal overdoses can cause behavioural changes among breeding birds, reducing their chance of successfully raising young and drastically reducing the population of forest songbirds. Pollinating insects such as bees, as well as various aquatic invertebrates, have been shown to suffer high mortality from fenitrothion exposure.

If that were the only cost—the loss of a few birds and insects in return for protection of thousands of jobs and millions of dollars in Canada's forest industry—it might possibly be argued that the bargain was acceptable. But let's not forget the lesson of the spider web. Everything interconnects. Touch one part of the system, and you touch it all.

Songbirds are important predators of destructive insects. Without their effect as natural control agents, our forests might be devastated by still more insect pests, each requiring the costly development and application of yet another chemical poison. Bees and other pollinating insects are essential to wild fruit crops which form an important source of food for many varieties of wildlife. Should these crops fail, the resulting starvation can be every bit as effective a means of death as poisoning. In the same fashion, if pesticides reduce the numbers of aquatic invertebrates, populations of game fish such as salmon and trout will decline and dollars will be lost to the tourism and recreation industries.

Nobody would suggest that our forests be abandoned to uncontrolled insect depredations. However, past evidence suggests that the cost of wholesale insecticide applications can readily exceed the benefits. There is no perfect method of pest control, and none should be adopted for use without stringent advance testing and continuous monitoring for side effects after it is in use. Otherwise, as we know too well, grave environmental damage will be the hidden price we pay for tampering with nature.

Toxic Fungus Offers New Budworm Control Possibilities

Brian Dalzell

Scientists at the Maritime Branch of the Canadian Forestry Service (CFSM) have identified a common fungus as an important factor in the natural collapse of spruce budworm populations. The discovery has implications for biological control techniques and for the development of new microbial insecticides.

A CFSM research project has shown that *Fusarium avenaceum*, a fungus commonly found growing on budworm-infested foliage, is poisonous to the insects under certain conditions. The scientists now believe that the fungus is one of the important natural causes of budworm die-off. Further field research may indicate that the fungus has promising potential for the development of more effective and acceptable means of budworm control.

Dr. George Strunz, research scientist at CFSM, explained during a telephone interview from Fredericton that the chemical responsible for the toxicity of the fungus is a member of the group of compounds called enniatins, which have been used as antibiotics. "This is not a new compound", says Dr. Strunz, "it was discovered about twenty years ago".

The enniatins' property of disrupting ion transfer between membranes, which makes them effective antibiotics, also makes them toxic to the spruce budworm.

Dr. Doug Strongman, research team mycologist, says that in addition to the toxicity of the chemical, enniatin "works like an insect repellent" under certain conditions. This function increases the chemical's potential scope of application and improves the likelihood that it will be developed. "This is a whole different ball game than the toxicity aspect", he says, "In terms of development, this is a big plus".

Both Dr. Strongman and Dr. Strunz caution that field studies have yet to be done to determine if the *Fusarium* and enniatin are as effective under natural conditions as they are in the lab. If the results of field studies are promising, a long development phase would be required for the discovery to have practical applications.

The toxic fungus offers two possibilities for budworm control. The fungus itself could be used in a program of biological control, or the toxic enniatin found in the fungus could be used in the development of new microbial insecticides.

Dr. Strunz suggests that the CFSM research may enable forest managers to successfully exploit natural populations of *Fusarium avenaceum* as a means of biological control of the spruce budworm. Biological control is cheaper and safer than other pest management methods, but requires an intimate understanding of the natural systems involved. "This may help us understand what's going on in nature", says Dr. Strunz of the project. He cautions that field studies have yet to be done to determine how the fungus will affect the budworm with many other variables present. "We haven't examined this out in the woods", he cautions.

In addition to the biological control potential, the identification of the chemical structure of a natural product which is toxic to the insect pests opens up a whole range of choices for the development of new environmentally acceptable microbial insecticides. Other microbial insecticides such as *Bacillus thuringiensis* (B.t.) have been well received by both environmentalists and forest managers, but the use of toxic fungal metabolites as insecticides has hardly been investigated. "It's important to have choices, considering how quickly insects adapt or develop a tolerance to insecticides", Dr. Strongman says.

The CFSM research is unique in that, although scientists have long been aware that fungi play a role in the decline of budworm populations, the actual mechanism through which they kill the insects had never been examined. "I was surprised", says Dr. Strongman, who worked with the CFS during 1986 and '87 on a post-doctoral fellowship. "There just wasn't any documentation on this." Dr. Strongman says that the research project was "really productive and exciting."

Dr. Strongman emphasizes that there is much work yet to be done. In addition to the required field studies on the *Fusarium* and enniatin, several other fungi and pathogens, which have been identified by CFSM ecologists as important natural factors in the budworm population cycle's collapse phase, have yet to be investigated.

It is a critical time for research on spruce budworm in the Maritimes. Recent lower budworm counts indicate that the budworm population cycle in the Maritimes is now entering the characteristic final stage of rapid decline. The study of the natural factors responsible for this decline, including *Fusarium avenaceum* and other fungi, could greatly benefit the Maritime forest industry before the cycle peaks again at devastating proportions.

News Release

Habitat Management Agreements

Fredericton (N.B. Information Service) — Natural Resources Minister Morris Green and Dave Neave, Executive Director of Wildlife Habitat Canada, signed two significant agreements May 5.

A Forest Land Habitat Management Agreement and a Wetlands and Coastal Habitat Management Agreement were signed at the Minister's Office in Fredericton.

"These agreements are extremely important to the future of wildlife and wildlife habitat in New Brunswick," Green said. "Funding from the agreements will allow the Province to acquire wetlands, conduct biological studies and implement management practices on both wetlands and forest lands."

We are excited about the work which has been scheduled for the Province of New Brunswick, said Neave. "This Province takes a leadership role in demonstrating ways to protect a variety of wildlife habitat through integration of forestry programs with wildlife habitat objectives."

Wildlife Habitat Canada is a national non-profit organization, dedicated to encouraging the retention and stewardship of wildlife habitat for the benefit of present and future generations. In 1987-88, WHC committed over $2 million in funding for wildlife habitat projects across Canada.

The five-year Forest Land Habitat Management Agreement will see Wildlife Habitat Canada support the Department of Natural Resources in achieving a fully operational, comprehensive forest habitat management program by 1992. The total cost of the agreement is $2,275,000 ($1,515,000 DNR, $760,000 WHC).

Activities include development of a program to define, test and refine relationships between wildlife species and forest land habitats, setting of habitat objectives for Crown timber licences; improvement of techniques in computer modelling and use of geographic information system technology and development of the capability of forest industry and DNR field staff to plan and assess forest management strategies in terms of meeting wildlife habitat objectives.

The five-year Wetlands and Coastal Habitat Agreement will see Wildlife Habitat Canada support the department in obtaining important wetlands and developing a wetlands and coastal habitat management strategy for the Province of New Brunswick.

The goals and objectives outlined in this agreement will complement an existing $5.5 million agreement between the Province and Ducks Unlimited Canada. Funds from the agreement with WHC will be used to acquire wetlands of provincial significance for enhancement or preservation; to develop and implement a private stewardship program; to develop a public awareness campaign on the importance of retaining and enhancing wetlands; and to integrate wetlands habitat development and fish management.

The Department of Natural Resources will spend $944,500 on the wetlands and coastal habitat management program during the five-year agreement; Wildlife Habitat Canada will contribute $822,000, $450,000 of which will be used for acquisition of wetlands. The remainder of the WHC contribution will be used to research and implement cost-effective wetland management programs.

In Quest of the Southern Twayblade

Jim Goltz

The Southern Twayblade (*Listera australis*) is one of my favourite wild orchids, despite the fact that its long-pronged, reddish purple flowers are only about the size of a mosquito. Of the 39 orchid species known to occur in New Brunswick, it is one of the rarest and probably one of the most likely to be overlooked. This report is intended to document the second record of Southern Twayblade in New Brunswick[1] and to inspire other botanists to search for and successfully locate new stations for this species.

The Southern Twayblade ranges from eastern Texas and central Florida north to Canada where it has been reported from Nova Scotia, New Brunswick, Quebec and Ontario. In the northern part of its range it inhabits spruce bogs, favoured haunts of other orchids and orchidomaniacs. According to Luer[2], "Plants are exceedingly difficult to find, usually requiring the searcher to crawl on... hands and knees over hostile terrain." Who could resist the challenge of searching for a species that has captured the imagination of Canadian botanists for over 90 years? Having met up with the Southern Twayblade in Ontario in 1974, I was determined to renew my acquaintance with it here in New Brunswick.

Perusal of topographical maps of the Fredericton area revealed extensive "string bogs" between Pokiok Settlement and Harvey Station. On foot, these were not so promising, as a heavy shrubby understorey had choked out most of the potential orchid habitat. By June 15, 1986 I had just about reached my tolerance limit for black flies, sunstroke and cold wet feet, when I literally stumbled into a small open sunny clearing at the edge of a bog near Harvey Station. From a luxuriant mound of soft, pale green sphagnum at the foot of a small black spruce glowed the crimson blooms of Southern Twayblade. Moments later the sun's rays shifted and the plant vanished wraithlike into the shadows. Nearby grew three other plants, all in bud.

When I returned the next day with Hal Hinds, all plants were in full bloom and we were able to locate three more, upping the tally to seven. None of the plants approached the massive height of 20 cm. reported for the species by Luer. The twayblades' niche here closely resembled the habitat that I remembered from Ontario. The plants typically disliked close competition but Three-leaved False Solomon's-seal (*Smilacina trifolia*) and Indian Pipe (*Monotropa uniflora*) grew in their general vicinity. In shady spruce woods not far away was a nice stand of Moccasin-flowers (*Cypripedium acaule*) in full bloom.

Is the Southern Twayblade as rare as it seems to be in New Brunswick? I suspect not. This June, why not look for this orchid in your favourite bog? Maybe you'll be lucky enough to find a plant with three leaves or pale blooms. If your quest fails you won't be disappointed. The boggy home of the Southern Twayblade is sure to hide other treasures.

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[1] See Cody, W.J. and D. Munro. 1980. The genus *Listera* in New Brunswick. Can. Field-Nat. 94: 443-446.

[2] *The Native Orchids of the United States and Canada excluding Florida* , C.A. Luer 1975, N.Y. Botanical Garden.

Ebenezer

Harold Hatheway

What could be so familiar and elusive, all at the same time, as a bird? Taken for granted, the reality is that we earth-bound humans are infinitely less mobile than birds. We can only envy their ability to fly up through the branches of a tree, across a river, or into the sky—which probably explains why getting really close to a bird, and being able to observe it in the wild, is such a special experience.

So imagine, if you can, the sheer delight of "making friends"with one of the most wary of our large native birds, literally at arm's length, over a period of several days. I'm still having difficulty in accepting what happened, and don't pretend to understand it, but let me share it with you.

Each summer my wife and I spend as much time as possible at our camp (definitely not a "summer home") on a lake in southwestern New Brunswick. The lake is well-cottaged at the accessible end, but paying the price of a sometimes cold and wet three mile boat trip rewards us with a great deal of privacy and an excellent opportunity to observe wildlife.

At about six o'clock on a mid-summer evening, we were relaxing on the beach when Margie said, quietly, "Look up the beach, near the woods".

No more than twenty meters from us, just where beach meets the trees, a raven had landed. Nothing remarkable about that, even a wary bird like the raven may overlook human presence if there is no movement, and the ravens had observed us long enough to determine that we were not hostile.

But this bird was not merely unobservant or casual. He (or she—only another raven would know for sure) worked slowly along the edge of the woods in our direction, apparently "budding"the young fir tips, possibly looking for late budworms, occasionally snapping at passing insects—and totally ignoring our quiet conversation and cautious movements, an easy stone's throw away.

His lack of concern was so marked that finally Margie got up slowly and went to the camp to get her camera. When he ignored that movement, and subsequent close-range shutter snapping, I followed suit. We both moved to within three metres or so, and the bird, while clearly aware of our presence, seemed as unconcerned as a barnyard chicken.

Obviously this was not normal behaviour and, as we observed the bird it became clear that he was not functioning at normal raven standards. Not only was his reaction to us quite out of character, but his movements were slow and not well co-ordinated. He missed objects he pecked at, he seemed to stagger at times, and his overall behavior was somewhat confused and uncertain.

Eventually we went up the path to our own, delayed, evening meal. Margie, whom I believe would comfort a sabre-tooth tiger if it looked in need, insisted that we should try to feed the raven. From my vast superiority as the family's official birdwatcher, I assured her that this was simply an aberration, and that the raven would be gone when we returned.

Inevitably, the raven was waiting for us—or so it seemed—when we went back. Not only was it there, exactly where we had left it, but it ate our offerings with enthusiasm and what, anthropomorphically, I can only call gratitude. In fact, encouraged by his attitude—but made cautious by the size and appearance of his bill at close range—I even put bits of food on the toe of my sandal and let him pick them off. Watching a large—very large—raven pick bits of bread off

one's toes, toss them in the air, and catch them on the way down with a loud "snap" is impressive—and sobering!

At the end of the show our new-found friend wandered up the beach and into the woods. I again indicated that we had seen the last of him—but less assertively this time.

Next morning he was at the same location—possibly because he associated it with food—and thus began the most remarkable birdwatching I have ever known. The bird followed us around all day like a pet dog, occasionally flying a brief distance (he seemed physically unable of sustained flight), but usually walking or hopping. (Hopping suits a robin to a "T"—when a raven does it the effect is a bit like watching a typecast undertaker trip the light fantastic on the way to the cemetery.)

By the end of the day he had established some food preferences. Not that he rejected anything but, as soon as he began to fill up, the less favoured items—particularly bread—were taken to the nearest convenient hiding place and carefully stored. During this second day the storage places were always close at hand - often only a few feet away.

That evening was a highlight. About seven o'clock we took our usual stroll around the cove, a matter of some two hundred metres. We were accompanied all the way—up and back—by a large, hopping, walking, occasionally flying raven, who obviously considered himself a part of the expedition. Totally delightful—but odd, very odd.

We wound up with a final feeding session. The bird was clearly more alert and wary, but at the same time appeared to have satisfied himself that we could be trusted—at least up to a point. Again he ate food from the toe of my sandal, I wish I could say from my fingers—but I lost courage at the sound of that "snap." This action, by the way, appeared to be a signal of appreciation of a particularly welcomed morsel, and not in any way intended to be threatening.

The next two days followed the same pattern. He had moved his morning location from the beach to a strategic one halfway between the back door of the camp and a small, essential building. In this way we were spotted almost as soon as we arose, and reminded by his silent, but obvious, presence that it was time for breakfast. He had become more and more wary of how close we came and, with increased flying strength, would move to a branch conveniently out of reach.

From time to time he would "sing" quietly to himself, and on one fascinating occasion a large flock (?) of the local ravens joined him on the beach for an apparently heated discussion.

Sunday arrived—this was a long weekend visit—and the end of our time off. Suddenly we realized that in a few short days we had become strongly attached to the now apparently fully recovered bird. He flew with ease, would disappear for an hour or more, then come back for food and to spend the night in a tree in back of the camp. While he certainly made full use of us as a food source he now seemed capable of foraging for himself, he had made contact with the local ravens, and we were reduced to the level of a convenience, rather than a necessity. Nevertheless, he continued to extend us a level of trust which was even more amazing, with the disappearance of dependence. We left a final cache of food, said our farewells, and left.

I have no certain explanation for the obvious incapacitation. Perhaps he had been exposed to some chemical; heavy aerial spraying had taken place in a nearby area a few days before, but the substance was not liable to effect birds—or so I was advised; the pesticide used to kill rats at the local municipal dump seems a likely suspect—dead or dying rats would be a logical food for the ravens who are always at that location.

The behaviour, while almost certainly a result of physical incapacity for whatever reason—was certainly peculiar. Birds cannot be assumed to use the same mental processes as humans, but it is

difficult not to attribute deliberate calculation to the raven. Certainly he was ill, with limited ability to feed himself, and in danger from whatever enemies ravens have. He solved the problem by approaching a previously observed source of food (we put table scraps out on a stump, and ravens have fed on them before), which he apparently determined was safe, or at least worth the risk. Proximity to the camp presumably lessened the danger of enemies.

What doesn't add up is the "family pet" routine. Food was made available before he chose to accompany us on our nightly walks, we made no effort to coax him to come with us—he simply invited himself to be one of the family. Lacking an explanation, we can only be grateful for a unique experience, one which will always be associated with a spot which has given us some of the happiest days of our lives. Certainly we never see the ravens without wondering if "our" raven is among them.

One Hundred Years Ago

A Look at our Past

Stephen Clayden

This article introduces what I hope will become a regular feature of the *N.B. Naturalist/Le naturaliste du N.B.*: a column devoted to reprinting excerpts from articles or books published a century ago in or on New Brunswick. It may come as a surprise to some readers to learn that as naturalists in the province we may lay claim to a long and distinguished tradition.

One hundred and one years ago, in fact, the Natural History Society of New Brunswick was already celebrating its twenty-fifth anniversary. Founded in Saint John in 1862, the Society had among its chief goals the formation of "such a collection of specimens as shall fully illustrate the natural history of this province and, as far as possible, that of other countries." Flowering plants, ferns, mosses, marine algae, diatoms, fungi, mammals, birds, reptiles, amphibians, fishes, butterflies, marine invertebrates, fossils, rocks, minerals—the field for investigation and discovery was practically unlimited , and the collections in the museum of the Natural History Society grew quickly.

In 1882 the Society began publication of its proceedings in an annual bulletin and through its pages the names and researches of a number of New Brunswick naturalists—L.W. Bailey, G.F. Matthew, M. Chamberlain, G.U. Hay and W.F. Ganong among others—were brought to the attention of scientists throughout Canada and the New England states. George Matthew (1837-1923) exemplified the tradition of the distinguished amateur in natural history, achieving international renown for his work in paleontology, while remaining employed professionally as a customs agent.

Far from being an exclusive scientific circle, the society welcomed the participation of all interested persons at its regular lecture and field meetings. Education of the public at large and the training of school teachers in the methods of natural sciences study became important objectives and the society's most active scientific workers were also its most enthusiastic teachers. Examination of the contents of *The Educational Review*, founded in Saint John in 1887 by George Hay, suggests that the study of geology, botany and zoology, drawing its examples from the local environment, was a more vital part of the curriculum in Maritime Provinces' schools during this period than at any other time before or since.

By 1910 the membership of the Natural History Society of New Brunswick had swelled to 630 and separate, and affiliated, societies were active in Fredericton, Sussex, and at Chatham, where

the Miramichi Natural History Association had, in 1901, founded its own museum and published bulletin. The two-storey plain white clapboard museum still stands on a quiet Chatham street and its front door opens off the sidewalk into an exhibit room largely unchanged by the passage of over 80 years. It is a remarkable treasure.

The causes of the demise, or at least the rapid decline of the provincial and regional natural history societies after the beginning of the First World War, remain one of the numerous unwritten chapters in the history of the natural sciences in New Brunswick. It became critically apparent at this time how strongly the provincial society had relied on the labours of a few very dedicated individuals. At the time of his death in 1913, George Hay, in addition to being vice-president of the society, was also the head or a mainstay of its committees on botany, lectures, press and publications. Before this he had served variously as president, secretary and curator.

The last issue of the *Bulletin of the Natural History of New Brunswick* was published in 1914. Without it, the society lacked the focus and cohesion it had maintained for the previous 33 years and the contributors to its pages, most notably William Ganong, lost a valuable outlet for the publication of their New Brunswick studies.

"One Hundred Years Ago..." will draw on the *Bulletin of the Natural History Society of N.B.*, *The Educational Review*, and other contemporaneous publications to remind us of incidents and events, people and places and of the development of knowledge during a golden age of New Brunswick natural history.

Arbor Day[1]

Begin at once, if you have not already done so, to make arrangements for ARBOR Day. Prepare—or better, let the pupils do it—a plan of the school grounds; mark upon it where trees are to be set out, flower beds with the particular shape of each, what dead trees of previous plantings will have to be replaced. If a tree promises to be stunted or ill-formed or unthrifty, mark it for digging up in order to supply its place with a more vigorous one. No worse place could be selected for a group of ill-formed or stunted trees than a school ground. Clear away any refuse that may have collected during the fall and winter, and prepare it for burning. Clear away the mulching that has been used to protect the roots of the trees during winter. Ask some successful cultivator in the district about the quality and quantity of a fertilizer to be strewn about the tree—early so that the spring rains may carry nourishment into the ground and about the roots.

Begin early to get the children interested in the work. No better plan could be adopted than to have a lesson on natural history every day. A little change in the order of lessons in this respect will be productive of excellent results at a time of year when confinement in close rooms and the routine of regular work begin to be irksome. Use the outline of lessons on botany in this number of the REVIEW, adapting what may seem best suited for your class. Turn to back numbers of the REVIEW, and look over the "Ferndale School" lessons. Look out for those insects that appear early, and especially for indications of those that are harmful to trees and farmers. Incorporate these lessons on plants and insects for a time more with the regular school work by letting pupils draw and write about the subjects taken up for the day. Carry out these lessons with spirit and intelligence and ARBOR Day will be a success.

[1] From *Educational Review* 1(11): 207, April 1888.

From the Pages of the Journals

Flying Dinosaurs

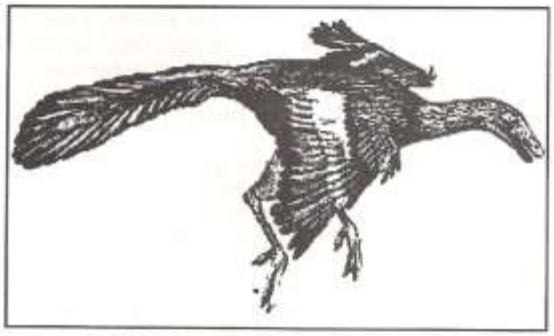
Christopher Majka

> "He is certainly a wise man who today can tell a bird from a reptile, with only the fragments of an ancient form before him." — O. C. Marsh, New York Herald, January 19th, 1890

Ever wonder why the dinosaurs vanished? Bet you'd be surprised if I told you they hadn't. "What!", you quickly think, "Has Roy Mackal finally discovered Mokéle-Mbêmbe in the Congo? Has the Lake Utopia monster returned?" No, not by a long shot. The dinosaur I'm talking about is at this very moment in your back yard. Visions of *Tyrannosaurus* running rampant through the vegetable patch? Don't believe me? Go ahead — take a look. I'll wait.

OK, what did you see? Aha! I thought so. A bird, right? It may come as a slight surprise but there are paleontologists who believe that the last of the dinosaurs are out there cavorting in the trees and they are called—you guessed it—birds! The subject of this essay is precisely one such bird/dinosaur—one which is particularly significant and controversial.

Archaeopteryx lithographica is the name which geologist Sir Richard Owen gave in 1863 to one of the most unusual specimens which he was to acquire in his career as curator of the British Museum of Natural History. It was indeed an irony that Owen, who was an opponent of Darwin's and espoused a kind of neo-Platonic concept of nature with species as static archetypes, should be the person who described the creature which has come to be used as one of the prime examples of evolution.



Archaeopteryx — is this bird a fraud?

The skeleton of *Archaeopteryx* which Owen described had been discovered in beds of so-called 'Solnhofen Limestone' near the Bavarian town of Pappenheim in 1861. In fact an *Archaeopteryx* skeleton had been found earlier, in 1855, but paleontologist von Meyer had described it as a pterosaur, *Pterodactylus crassipes*. Other specimens are a feather discovered in 1861 and skeletons found in 1877, 1951 and 1956.

Ever since its description by Owen, *Archaeopteryx* has occupied the limelight in many battles, skirmishes, and full-scale wars between factions of biologists, paleontologists and fundamentalists trying to establish their own versions of the creation of the world. Fittingly, *Archaeopteryx* continues to be the subject of much controversy and debate, even today.

For those unfamiliar with the the beast (I'll shy away from using the word 'bird' for the time being!) the accepted interpretation has *Archaeopteryx* as a feathered, crow-sized creature with a long tail. The tail, unlike those of modern birds which consist solely of feathers, was a long affair of bone, muscle and ligament clad with feathers. In common with birds like the South American

Hoatzin (*Opisthocomus hoazin*) the 'wrists' of the wings terminated with long reptilian claws. Rather than a beak, it had a scaled snout complete with teeth. All these features (and other skeletal ones) point to its reptilian origins. It is quite unlike reptiles in having (of course!) feathers, wings, a wishbone and a perching foot. This amalgam of avian and reptilian features made it the perfect candidate for a 'missing link' between the two groups. Its discovery was used by Darwinists as 'proof' of the theory of evolution and an example of how seemingly separate forms had once had intermediate links between them.

Thus far I haven't told you much more than you might recall from your high-school biology classes but *Archaeopteryx* has a few tricks up its feathered sleeve. Creationists were quick to rally and object that, although this was indeed a vanished form lost in the antediluvian past, it was no missing link. It was quite different from either reptiles or birds. In effect they demanded of the evolutionists that even further 'missing links' be discovered. Owen himself wrote:

"How is it if all animals have proceeded by gradual modification from a common stock that... great gaps exist?"

T. H. Huxley, a prominent defender of evolution in the 19th century, replied thus:

"We, who believe in evolution, reply that these gaps were once non-existent; that the connecting forms existed in previous epochs of the world's history, but they have died out."

Thus, rather than providing open and shut proof of evolution, the discovery of *Archaeopteryx* made the controversy even more heated. Some of those squabbles have faded to silence in the past; since the time of Huxley the evolutionary relationship of birds to reptiles has been well established and is now accepted by the overwhelming majority of informed opinion. *Archaeopteryx*, however, continues to be the fulcrum of debate.

One such issue concerns the question of whether *Archaeopteryx* could actually fly? What, you might ask: can a bird fly? Is the Pope Polish? Well the case of *Archaeopteryx* is a little more complicated. It did not have the characteristic keeled breastbone to which the flight muscles of today's birds are attached. This, combined with its heavy tail and claws does not augur well for flight. Some researchers have noted its greatly thickened and fused collarbone which could have served as an alternative site for muscle attachment. The jury is still out as to whether *Archaeopteryx* could simply glide from tree to tree, much like today's flying squirrels, or whether it was capable of true flight. In any event it seems that, even at best, *Archaeopteryx* was not a skilled aerialist.

An even more potent and acrimonious dispute with respect to *Archaeopteryx* has broken out in the pages of today's scientific journals. The central figure in this dispute is another well known peer of the British House of Lords, Sir Fred Hoyle. His name might already be familiar to many of you but in a different context. Fred Hoyle is a famous British astronomer and long-time proponent of the 'steady-state' theory of the universe (as opposed to the 'big bang' theory—a scientific dispute which we will not go into here!)

In an article in the *British Journal of Photography* (Vol. 132, March 1985) Hoyle and associates make the rather astonishing claim that *Archaeopteryx* is a forgery! From examining the specimen in the British Museum and from photographs which they took of it they argue that the impressions of feathers in the stone were faked. They claim that someone must have made a cement-like matrix which was applied to the stone and into which chicken feathers were pressed in order to leave the impressions of plumage! They further claim that the sedimentary textures of the slab and counterslab are different and that on a fine scale these two slabs do not fit 'hand-in-glove' the way they ought.

These astonishing claims have been widely reported through the world's media. It is a curious dispute because the principal exponents of this view are not paleontologists. Hoyle is an astronomer, his colleague Chandra Wickramasinghe is an astrophysicist and Lee Spetner is an Israeli physicist. It calls into question a major piece of fossil evidence regarding evolution and impugns the integrity of Sir Robert Owen, one of the major pillars of British paleontology, who, it is alleged, must have been privy to the hoax. Why Owen, who was an opponent of Darwin and evolution, should have wanted to do something of this sort also boggles the imagination. If such an allegation were true it would be even more astonishing than the exposé of the Piltdown Man.

The authoritative rebuttal of this view comes in a paper unequivocally entitled "*Archaeopteryx* Is Not a Forgery," by Alan Charig, Frank Greenaway, Angela Milner, Cyril Walker and Peter Whybrow (*Science* 232: 622-5, 2 May 1986) . Their arguments are technical and detailed but in essence they show that there is no evidence of such 'doctoring' of the slab; that mineral-filled hairline fissures extend from the feathers and into the bones of the animal proving that they are from one and the same source; that mineralogical evidence conclusively shows that the slab and counterslab connect together and that differences in sedimentary texture between the two are perfectly in keeping with such deposits and the ways in which they are created. They point out that there are remains of five additional *Archaeopteryx* discovered at various times and places and under well documented conditions. In only one of these specimens is the state of preservation such that the presence of feathers cannot be established with certainty.

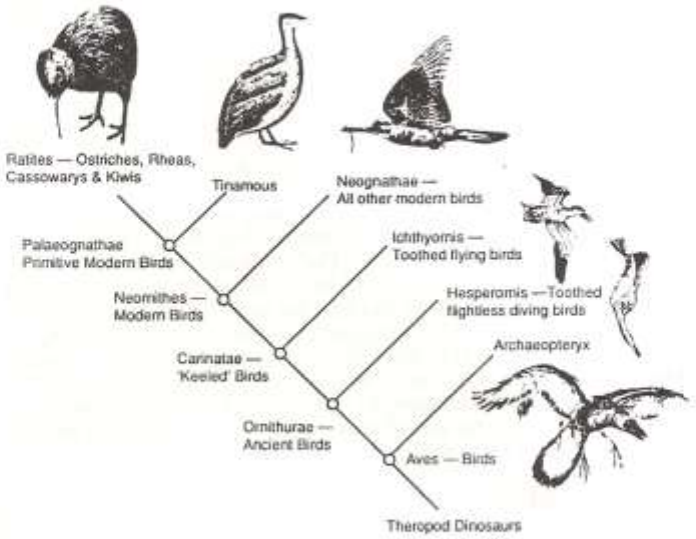
Others might be deterred but Hoyle and Wickramasinghe have replied with *Archaeopteryx , The Primordial Bird*, a book published in 1987 (Christopher Davis, London). In it they repeat their earlier claims and also advance the notion that evolution proceeds in sudden fits and starts as a result of genetic storms of viruses carried to the earth from outer space. "Egad," you might think "where is the line between science and science fiction?" Molecular biologists have reacted with embarrassment to these ideas and have replied that there exists not an iota of evidence to support these wild theories. In a review of the book in *New Scientist* (10 September 1987), Beverly Halstead writes:

"This contribution [is] one of the most despicable pieces of writing it has ever been my misfortune to read. It displays utter contempt for minimal standards of scholarship... [and] will remain for a long time a stain on the reputation of both authors."

Not an ambivalent response.

Archaeopteryx meanwhile continues to be the subject of serious scholarship and causes dispute among scientists who do not question its authenticity. In an article published in the *Zoological Journal* (82: 119-158) of the Linnean Society in 1984 and called "The avian relationship of *Archaeopteryx* and the origin of birds," R. A. Thulborn argues that *Archaeopteryx* is not, in fact, a bird at all! From careful morphological analysis of birds, dinosaurs, reptiles and *Archaeopteryx* he concludes that *Archaeopteryx* is no more closely related to birds than several types of theropod dinosaurs including tyrannosaurids and ornithomimids. He argues that *Archaeopteryx* is not an ancestral bird and transfers it to the dinosaur suborder Theropoda. He believes that there may not, in fact, be any 'missing link' between dinosaurs and birds to be discovered in the fossil record but that birds may have arisen by means of a 'saltative' change between the two groups. By this he means a sudden and abrupt evolutionary change rather than the gradual and progressive kind advocated by Darwin.

Taking the opposite view is Joel Cracraft in an article called "The origin and early diversification of birds" *Paleobiology* (12: 383-389). Using techniques of so-called 'numerical taxonomy' his research indicates that *Archaeopteryx* is indeed the 'sister-group' for all remaining birds. Numerical taxonomy provides a mathematical model of kinship between groups based upon an analysis of different morphological features. It aims to be a more 'objective' way of



representing evolutionary relations than conventional taxonomy. An 'evolutionary tree' of birds as it emerges from his analysis of 73 different anatomical features of birds is shown above.

So, in the end, what is *Archaeopteryx* ? Was it a theropod dinosaur or a bird? Could it fly or not? Is it a crucial missing link or a bizarre offshoot? A legitimate fossil or an artful hoax? The answers to these questions are far from complete but I'll bet that *Archaeopteryx* will continue to provoke curiosity and debate for a long time to come.

Nature News

Winter 1987-88

David Christie

Winter nature reports were mostly of birds but federation member Jean Isaacs was thrilled to see a **Cougar** cross her yard at Kingston about the end of February. Ralph Eldridge saw a whale enter Saint John Harbour—a rare event—Feb. 17, apparently in pursuit of gaspereau or herring. Originally it was thought to be a **Minke Whale**, about 30 feet in length, but Ralph's photographs suggest it may have been a **Humpback** (Tim Beatty). A number of Humpbacks were reported to have stayed in Grand Manan waters all winter (v.o.).

The season's bird highlight, a female **Eurasian Kestrel** was discovered by Stuart Tingley at Fort Beauséjour, Aulac, Jan.18. About the tenth record of that species in North America—the second in Canada—the kestrel received national publicity and attracted both local and distant birders. It turned out that the kestrel had been seen—but not identified at the time—at Fort Beauséjour as early as Dec. 30. The bird moved back and forth between Aulac and Minudie, N.S., 5 km across the bay, and was last seen sometime in March.

This winter's **"Bullock's Oriole"**, western subspecies of the Northern Oriole, is the first well-documented record in New Brunswick. A female, it visited Margaret Gibson's garden at Fredericton Dec. 13, 18 and 19 and was photographed by Don Gibson.

A **Turkey Vulture** was seen near Salisbury Dec. 7 (Jim Wilson) and a nearly adult **Golden Eagle** at Shepody, near Riverside-Albert, Feb.28 (Wilson & Cecil Johnston). An adult **Peregrine Falcon**—a banded bird from the release program—which was catching robins near Saint John Dec. 31 and Jan. 2 was probably the same one seen later in January in the city proper (v.o.)

The abundance of mountain ash fruits was responsible for even greater counts of **American Robins** along the Fundy coast than found on the CBCs. Between 1000 and 1500 near Saint John, at Anthony's Cove, Dec. 29 had dwindled to four or five hundred Jan. 2 and only 16 in very cold weather on the 11th; many of them were foraging on the tidal flats (Wilson). 500+ robins feeding on berries at Blacks Harbour Jan. 9, were accompanied by 1000+ **European Starlings**, 200+ **Bohemian Waxwings**, and 25 to 30 **Cedar Waxwings** (Dalzell). Later in the winter small flocks of up to 20 robins were reported along the Albert County coast and many individuals and groups up to eight at various locations in Saint John (v.o.) Two at Roachville must have eaten fermented berries; they were reported as singing during a January cold snap (Mrs. Roach, *fide* Harriet Folkins)!

There continued to be exceptional numbers of **Northern Shrikes** throughout the winter. Brian Dalzell counted nine while travelling from St. Stephen to Deer Island Jan. 17.

Sackville's **Red-bellied Woodpecker** was last seen Dec. 29 (*fide* Rob Walker). Another visited Glen Niles' feeder at Burton Dec. 18 or 19 (*fide* Peter Pearce). The **Red-headed Woodpecker** recorded on the Saint John CBC continued to visit feeders there until late in January (v.o.)

The **Pine Warbler** on the Grand Manan CBC survived until mid-February (Elaine Maker) and the Hammond River **Rufous-sided Towhee** till the second week of January (Mr & Mrs Gerry Mills).

In addition to the areas reporting them during the CBC, a very late **Great Blue Heron** flew west at Riverview Jan. 23 (Doug Whitman), **Bald Eagles** were seen at Fundy National Park Jan. 15 (2—Rod Lutes, *fide* Angus MacLean), Sussex Jan. 14 (adult—Ruth McLeese), Oxbow Jan. 15 (imm.) and the Little Tobique, Mamozekel and Campbell Rivers Feb.19 (possibly only 2 adults involved—Jenkins), **N. Goshawk** near Bubar Brook, Serpentine River, Feb. 4 (Jenkins), **Am. Kestrels** near Port Elgin Feb.14 (Christie & Mike Majka) and on Partridge Island, Saint John, Feb. 27 (Eldridge), a white **Gyrfalcon** at Mary's Point Dec. 5 (Mike Majka) and a gray one at Saint John Feb. 12 (Wilson), a **Thick-billed Murre** found dead at Chiasson Office, Ile Lamèque, Dec. 27 (CNPA), **Snowy Owls** at St-Léonard from January onwards (COM) and at Plaster Rock from the last week of January until at least Apr. 4 (Erwin Landauer & Jenkins), two **Yellow-rumped Warblers** at Shippagan Dec.12-30 (Jonathan LeBreton), **Lapland Longspur** in Madawaska County (COM), **Purple Finches** in Saint John in January (Tom Page), and 6 **Red Crossbills** at Riverview Jan.28 (Whitman).

Clarification — On p. 54 of the last issue I referred to a lynx trapped on Ile Lamèque. It should be noted that it was not determined whether the animal was a Canada Lynx *Lynx canadensis* or a Bobcat *Lynx rufus*.

Abbreviations

CNPA — Club de naturalistes de la Péninsule acadienne
COM — Club des ornithologues du Madawaska
fide — reported by
v.o. — various observers

My Tenants, the Bluebirds

Mary Majka

Over 20 years ago the Moncton Naturalists' Club embarked on an ambitious project: to provide bluebirds with nesting boxes. We bought some boards, and Charlie McEwen, a bluebird and Purple Martin fancier, cut them into proper shapes and sizes and drilled the entrance holes. I volunteered to nail the boxes together and find suitable places for them—easier said than done. There were one hundred of them!

A neighbour in the valley below Caledonia Mountain, where we then lived, offered to store the lumber in her garage. Each morning for two weeks I sped down to the garage and banged away till my knuckles turned white and blue. (It was early spring and pretty cold.) Finally the garage was full of bird houses, and people kept stopping by to inquire how much I was selling them for.

Next I embarked on the second, more adventurous stage of the project. My little Volkswagen loaded to the gills with bird boxes, I roamed the countryside searching for suitable habitats equipped with fence posts or trees. In the process of climbing over or sliding under fences I tore a few pants and sweaters (despite the fact that 20 years ago my posterior was much less protruding than it is today.) It took two weeks or so till my neighbour's garage was cleared of boxes and they, as well as other members of the community, were proud owners of at least one or two bluebird boxes.

In my wanderings through Westmorland and Albert Counties I discovered a lot of friendly people, who when approached and asked if they wouldn't mind having a bluebird box on their property were not only helpful but downright grateful to be chosen. Many assured me that they loved birds, and often they knew surprisingly much about them. (WE must remember that 20 years ago birdwatching was not as popular as it is nowadays.) Occasionally a grouchy landowner simply told me to beat it. One even chased me with her dog. (I think she suspected I was using the box as an excuse to convert her to some other religion.)

I also vividly remember my encounter with a big bull, as I started to nail one of the boxes to "his" fence post. Luckily, there were a barbed wire and a ditch between us! Some domestic geese gave me a hard time and I will surely never forget the electric shock I got from a fence I didn't realize was "loaded". I had crossed that fence without harm when I hung up the box in May. In June, however, I decided to see how many boxes were occupied and who lived in them. That time the farmer had turned his cattle out to pasture and the juice on.

Checking the boxes in June provided me with an opportunity to look up some of my newly made friends, who excitedly reported the arrival and nesting of their birds. Almost all our boxes had Tree Swallows as tenants. In one, a chickadee occupied much too large a space; in another, a pair of House Sparrows had found a home. One box was empty and I soon discovered why—I had hung it on a telephone pole only a metre below a sparrow hawk's nest in an old flicker-hole!

Abandoned farms were one of my favorite locations and I have special memories of two of them. As I parked below one empty house and stood watching the nest box from some distance away, a man burst from the house on the opposite side of the road.

"Hey you, he shouted. "Leave those birds alone. Don't go near that box." He was a heavy man with a red face and he was almost running.

"I'm not doing them any harm," I called back.

"This is my brother's farm. He's away. I don't know where that box came from, but it's got birds in it and I don't want anything to happen to them." His face was still red and grim.

"I hung up that box." I said. "I put many of them out this spring, and now I'm just checking them. They belong to the Moncton Naturalists' Club."

The change on the man's face was dramatic. A big grin spread across his face and his eyes smiled at me. "Oh, so it was you. I couldn't figure that out. My brother's been gone for over six years."

Needless to say we parted as friends.

I wish the other memory was just as happy. And in a way it did turn out to be. But my first reaction was shock. Walking through long grasses, I approached a long abandoned house with a large orchard when I suddenly realized that since my last visit all the windows had been smashed. The torn curtains were blowing in the wind. The door was open wide. On the gate post beside the house the bird box was gone. Its remains, together with the contents, lay smashed in the grass. I looked around in dismay.

Suddenly I heard the twitter of a swallow. Two of them sat in an apple tree as bewildered and disturbed as I was. I ran to the car. A box! Yes, I had a spare one in the trunk. I was nailing it hastily on the gatepost when the swallows circled above my head and almost landed on the box before I had it up.

After returning home I got a telephone call from a neighbour. "I was embarrassed to tell you," she said, "but I know who smashed all the windows and the bird box. The reason: it... it was a Boy Scout troop and I know the leader."

Of course, I was embarrassed too. I used to be a Girl Guide myself. I phoned the leader. He admitted losing control of the boys. He did not realize they had smashed the box. He apologized.

"That is not enough I told him. When is your next meeting?"

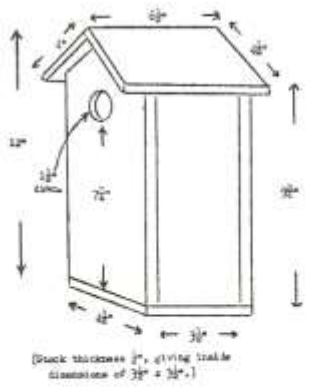
I went, equipped with a couple of pieces of lumber, cut-to-order, and a diagram of a bird box. The rest is easy to guess. A remorseful Scout troop built and hung up 20 nesting boxes!

But the real highlight of the project came one Saturday morning.

"Mother, mother, There is a bluebird in the trees," Chris ran into the house. And indeed there was—a beautiful male twittering away in the nearest maple. A box! Yes, I still had one. Only the day before I had been on TV demonstrating how to put one together. Now it would have a use. I grabbed a hammer, the box, a nail. Quick—where to put it?

My family assembled outside, watching and teasing. "Yeah, yeah, the bluebird will know you want him to nest in that box."

But he did—and in no time at all! Fifteen minutes later the bluebird excitedly examined the box. The next morning he brought his bride. They had three young. Of a hundred boxes the only bluebird pair had to nest in front of our house—a just reward for all my troubles.



Other individuals in the province have constructed and hung up bluebird boxes. Jim Wilson placed over a dozen in a particularly good area near Pennfield, where bluebirds are seen regularly each year. Although Jim had several pairs of bluebirds nest (see N. B. Nat. 4:7-8; 1973; his plan derived from the measurements of natural cavities used by bluebirds is reprinted here) a number of boxes were smashed or disappeared. Jim's conclusion was that it would be better to let the bluebirds find their own secluded places rather than to be harassed by cruel people attracted to birdhouses in an uninhabited area. Others I now of, who have tried attracting bluebirds in this province, have had less success. It seems that the population of bluebirds in most parts of our province is so scarce that rarely will a pair be enticed to nest. However, the many Tree Swallows that profit from our efforts should be almost as welcome.

Book Reviews

Rhum : The Natural History of an Island. Edited by T. H. Clutton-Brock and M. E. Ball, 1987. Edinburgh University Press. 125 pages. (Available through Columbia University Press, 562 West 113th Street, New York, N.Y. 10025. U.S.$25.)

Reviewed by Molly Smith

1797 : "... the island of Rum [an older spelling] will one day be considered, if not the most remarkable of the Hebrides, at least a very important field of enquiry." Edward Daniel Clarke.

1824: "... the wildest and most repulsive of all the islands" John McCulloch.

1947 : "The island of Rum, with its three rock types, is for the most part, a closed book to naturalists [being at the time under private ownership]. We may hope that this unfortunate period of its history is drawing to a close and that it may yet have a future as a priceless wild life reserve." F. Fraser Darling.

1957 : Island of Rhum purchased by the Nature Conservancy Council of Great Britain as an outdoor laboratory and demonstration area.

In light of Fraser Darling's prediction it is interesting to note that by 1987 Rhum is listed as a National Scenic Area, National Nature Reserve, Biosphere Reserve (UNESCO) and is a candidate for the list of World Heritage Sites.

Much of the material in this book has already been published in scientific journals. This is an account for laymen in the Island Biology series from Edinburgh University Press.

Beginning with an account of the complicated geological history of Rhum which explains the variety of soils and vegetation, succeeding chapters are entitled Human History; Botany, Woodland and Forestry; Invertebrates; Birds; Red Deer; and Ponies, Cattle and Goats.

In the appendix are annotated checklists of plants and vertebrate animals recorded on Rhum and the reader is directed to principal sources of invertebrate records.

This small volume (12x20 cm) is well produced and easily read. Maps and diagrams are clear and there is an adequate number of black and white photographs. The dust jacket is an attractive reproduction in colour of a typical landscape.

At the end of each chapter is a bibliography and at the end of the book an index, quite adequate for a small volume.

As an ecological case study, the book's interest goes well beyond Great Britain. It would be an interesting and valuable addition to any natural history library.

The Great Trees of New Brunswick. Text by David Folster, 1987. Canadian Forestry Association of New Brunswick, 65 Brunswick Street, Fredericton, N.B. E3B 1G5. 63 pp., illus. $9.95.

Reviewed by S. R. Clayden

The Great Trees of New Brunswick is a product of a provincial bicentennial project of the Canadian Forestry Association of New Brunswick. The aim of the project, which is an ongoing one, is to locate and document New Brunswick trees of outstanding size or beauty as well as those of special historical or ecological interest. Nominations to a registry of great trees were solicited from the public, and from the 135 submissions received up to October, 1987, 49 were chosen for the book. They range from individual trees to tree stands, planted trees to trees growing spontaneously, from the curious to the majestic and the native to the exotic.

Twenty-three species are represented in all, including 10 non-natives. Sugar maples, white elms and white pines together account for 20 of the 49 great trees, an indication of the historical importance of these species in the New Brunswick economy and landscape. The lack of any balsam firs, red spruces, beeches or birches presumably has more to do with the variety of candidate trees available to the selection committee than it does with a decision to exclude them. Each great tree is illustrated with a colour or black and white photograph. Many of these show off their subjects to breath-taking effect, but a number of the black and whites have reproduced poorly, apparently having been made from colour transparencies that were not sharply focussed.

The author's journalistic background shows in both the style and focus of the text. For me it made for entertaining reading on a cold mid-winter evening. The text accompanying each photograph provides a short sketch of the special character of the tree or stand. In the majority of cases the emphasis is on connections with early European settlers in New Brunswick or on particular historical events. The natural history of some trees is also described, especially where this could be deduced from a distinctive or unusual shape. There is a maple tree on the Miramichi, for example, with an apparently split personality, one half having normal green foliage while the other is deep maroon in colour. See page 46 for a diagnosis of the condition!

While the book is obviously not intended as a reference work on the biology or distribution of New Brunswick trees, naturalists may be disappointed not to find more information of this kind in it. We read in four different places (pp. 7, 22, 45, 52) of the use of tall straight white pines for masts and spars by the King's Royal Navy in the 18th and 19th centuries, but find no elaboration on R. E. Balch's observation in the foreword to the book that this once dominant tree in New Brunswick's forests "has come down in the world, the victim of an insect (the white pine weevil), a fungus disease (the white pine blister rust), and the lumber jack." In other places, we are presented with unattributed anecdotal information, as in the following: "a hot water bath in which hemlock boughs have been steeped is said to be very soothing" (p. 39) or "the trees safest from lightning are said to include aspen and beech" (p. 51). One wonders if W. F. Ganong, to whose memory the book is dedicated, wouldn't have insisted on a source for such claims.

I have dealt with what I perceived to be some of the minor shortcomings of the book, but I can nonetheless recommend it highly to New Brunswick naturalists. It is attractively produced and

will, I suspect, find good use as a companion to travellers on and off the beaten track in the province. Some may see in it a challenge to observe (dare I say list) as many as possible of New Brunswick's great trees.

It is open to question, perhaps, as to whether or not a focussing of attention on individual notable trees will also help to foster awareness of the condition of the province's forests. Dr. Balch's eloquent foreword to the book states in concise terms the need for mixed species silviculture in New Brunswick if the diversity, stability and multiple uses of the forest are to be maintained. Maybe a photograph of a vast unreforested clearcut in the hinterland of Northumberland or Victoria County, or of another planted over in a monoculture of black spruce, would have helped to reinforce the message. It is to be hoped, however, that books of this kind will bring greater public attention to trees in general in the province. Naturalists may well wish that the whole process of education could be greatly accelerated.

Federation News

Forest Education Cards

The Public Information Division of the N.B. Department of Natural Resources and Energy with the assistance of our federation, the Canadian Forestry Service and the N.S. Department of Lands and Forests recently produced a lovely set of cards depicting 60 representative species of Maritime woodland flora and fauna. The cards are intended for school children and are not unlike those of favorite athletes, to be treasured, collected and traded by youngsters. Distributed to Grade 4 teachers in the province they will be given to children who have demonstrated their interest in the forest by identifying, observing, writing about or depicting things in nature. In essence,they will "earn" the cards rather than just having them handed out. The premise is that youngsters will not only collect the cards and study the pictures but also learn something about each species—its life, habitat and distribution—from reading the text (French and English) on the reverse side.

The federation was asked for its help so I volunteered to coordinate this educational endeavour and approached a number of our members with a request for photographs of our native woodland flora and fauna. The text has been specifically geared to be short, simple and understandable for fourth graders. The cards will be distributed in New Brunswick and Nova Scotia; interest has also been shown in obtaining them for schools in P.E.I. and the State of Maine. The Province of British Columbia, which would of course have to develop its own set, is also very keenly interested in the concept. We are hoping that the enthusiasm with which this new educational tool has been greeted will enable us to produce new sets encompassing other forest life and perhaps eventually lead to production of sets on other subjects in nature. — M.M.

Endangered Species of New Brunswick

Another useful educational endeavour—an aid for teachers and anyone interested in wildlife conservation—has been the publication of a brochure on endangered species in New Brunswick. A personal Wildlife '87 project, it was the brainchild of federation member Jane Tarn who prepared the text. Lovely illustrations enhance this valuable brochure. The federation supported Jane's application for the 1987 Environment Week funding which made its publication possible.

Copies of the endangered species leaflet can be obtained from the Canadian Wildlife Service (P.O. Box 400, Fredericton, N.B. E3B 4Z9), from the Natural Science Department of the New Brunswick Museum (277 Douglas Ave., Saint John, N.B. E2K 1E5), and from Jane Tarn (21 Forest Acres Court, Fredericton, N.B. E3B 4L2). If writing to Jane, please enclose a 37¢ stamp to cover her mailing costs. — M.M.

Calling All Bird Feeder Watchers!

Have you ever wondered where the birds at your feeder come from, where they go when they leave, and why bird numbers change from year to year? Do you want to know what birds come to feeders in different parts of North America? Project FeederWatch is a new continent-wide survey of bird feeders designed to help answer questions such as these, and you are invited to join.

Project FeederWatch is a cooperative research venture of the Cornell Laboratory of Ornithology and Canada's Long Point Bird Observatory, and is in the midst of a successful pilot year with 4,000 participants from all across North America. The project is modelled on a survey run successfully in Ontario for the past 11 years, which has shown that male Evening Grosbeaks winter farther south than females, Black-capped Chickadees are found in low numbers when Evening Grosbeaks are abundant, and numbers of many species at feeders parallel those found on Christmas Bird Counts.

Sound interesting? Project FeederWatch needs thousands of additional observers across the continent to help answer questions about feeder birds on a broad geographic scale. You need not be an expert birder to take part. The project concentrates on common species, and baffling rarities can be ignored. Although counts are made over a one- to two-day period of your choice every other week from November through March, you are not obliged to watch every time, nor must you watch continuously on count days. All observations are recorded on computer readable forms so that detailed summaries can be provided to participants promptly each season and to insure that the data are readily available for further analyses.

In return for your observations, Project FeederWatch will send you an annual newsletter and report on the season's results, plus 2 issues of *Birdscope*, the Laboratory of Ornithology's research newsletter. If you can't take part but would like to receive these publications anyway, you may subscribe to them separately.

Project FeederWatch requires an annual registration fee of $9 (Canadian), which helps to pay for data forms, analysis and preparation and mailing of reports and newsletters. To join, write to Erica Dunn, Coordinator, Project FeederWatch, Long Point Bird Observatory, P.O. Box 160, Port Rowan, Ontario N0E 1N0. Include your name and address, state whether you wish to contribute observations from your feeder or just receive reports, and enclose your check for $9 (made payable to 'Project FeederWatch') . Please sign up right away, to help them plan how many forms to print and to avoid mailing delays. You will receive all materials and instructions just before the season begins in mid-November, 1988. Project FeederWatch began in Canada. Let's keep our end up and show those to the south of us where their birds really come from!

Affiliated Organization News

How About Going to a Naturalist's School This Summer?

Tim Beatty

Sunbury Shores is offering another gamut of courses this summer in both art and nature.

The season will begin July 4-8 with GEOLOGY OF SOUTHERN NEW BRUNSWICK taught by Prof. Richard Grant of the University of New Brunswick. A combination of field and class work will touch on such topics as geological dating, glaciation, local sediments and volcanics, as well as fossil analysis.

Dr. Jim Goltz of Fredericton will be teaching the second nature course of the summer, WILD FLOWERS OF NEW BRUNSWICK, July 29-31. He will stress how to search for and identify specific plants through a basic knowledge of the plant's habitat.

August 5-7 we will be offering a course on the WHALES OF THE BAY OF FUNDY. As Sunbury Shores naturalist, I will be teaching the 3-day course which includes lectures on whale behaviour, their evolution and the controversy surrounding their hunting. There will also be two trips to see the great whales.

Jim Wolford from Acadia University will be giving BIRDS AROUND THE BAY August 22-26. This 5-day course will cover both shore and terrestrial birds. The course will also include a trip to Grand Manan Island and an Ocean Search cruise to look for oceanic birds and perhaps a Right Whale.

September 16-18 Hal Hinds from U.N.B. will be offering a course, EDIBLE MUSHROOMS AND TOADSTOOLS, designed for the novice who may enjoy picking mushrooms but is a little unsure of what is safe to eat.

We will also be offering several different types of cruises this year starting with PICNICS ON THE BAY, a cruise designed for the entire family. We will weave our way through the west Fundy Isles in search of porpoises, seals and a variety of sea birds, and later row ashore for a picnic lunch and some beachcombing on a small island. These excursions will be held on July 2, 9 and 16.

Whale watching will come in two forms this year. On Wednesdays and Sundays after July 20 we will be taking half-day whale watching excursions out into the bay. On Saturdays we will be offering a full day WHALE WATCHING WORKSHOP which will entail a morning of slides, films, and lectures followed by an afternoon on the water.

Our art programme this year includes courses in wildlife art, print-making, drawing, mixed media, art history, art for teens, water-colours and photography. We are also offering eight week-long children's programmes that combine art- and nature-related activities.

If you would like to know more about any of these courses and or would like to register call us at (506) 529-3386 or write Sunbury Shores Arts & Nature Centre, P. O. Box 100, St. Andrews, N.B. E0G 2X0

NEW BRUNSWICK FEDERATION OF NATURALISTS

277 Douglas Avenue, Saint John, N. B., Canada E2K 1E5 Tel.: (506) 658-1842

LA FÉDÉRATION DES NATURALISTES DU NOUVEAU-BRUNSWICK

277, avenue Douglas, Saint-Jean, N.-B., Canada E2K 1E5 Tél.: (506) 658-1842

The federation is a non-profit organization formed in 1972 to facilitate communication among naturalists and nature-oriented clubs, to encourage an understanding of nature and the environment, and to focus concern for the natural heritage of New Brunswick.

La fédération est une organisation sans buts lucratifs formée en 1972 pour faciliter la communication entre les naturalistes et entre les divers clubs axés sur l'étude de la nature, pour encourager une meilleure compréhension de la nature et de l'environnement naturel, et pour éveiller le souci pour le patrimoine naturel du Nouveau-Brunswick.

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Veuillez faire votre chèque à l'ordre de La Fédération des naturalistes du N.-B. et postez-le à: Harriet Folkins, trésocier,C.P. 12, Sussex, N.-B. E0E 1P0 Canada

FEDERATED CLUBS / CLUBS FÉDÉRÉS

Chignecto Naturalists' Club, Box 1590, Sackville, N.B. E0A 3C0; 536-2333 or 536-0454; meets Sackville Public Library, 7:30 pm, 1st Thur., Sept.-June

Club de naturalistes de la Péninsule acadienne, C.P. 421, Lamèque, N.-B. E0B 1V0; 344-2286 ou 395-5023; réunions alternants entre Caraquet, Shippagan et Tracadie, 1ier mercredi, sept. à juin; *Le Gobe-mouche* mensuel

Club des ornithologues du Madawaska, a/s Danielle Nadeau, RR 4, Edmundston, N.-B. E3V 3V7

Fredericton Nature Club, Box 772, Station A, Fredericton, N.B. E3B 5B4; 459-8685 or 454-2117; meets N.B. Craft School, 7:30 pm, 1st Wed., Sept-May

Grand Lake Naturalists' Club, c/o Lionel Girouard, RR 1, Minto, N.B. E0E 1J0

Kennebecasis Naturalists' Society, P.O. Box 12, Sussex, N.B. E0E 1P0; 433-1801 or 433-6473; meets St. Paul's United Church Hall, 8 pm, 4th Mon., Sept.-May

Miramichi Naturalists' Club, 276 Heath Court, Newcastle, N.B. E1V 2Y5

Moncton Naturalists' Club, 771 Mountain Road, Moncton, N.B. E1C 2R3; 857-4271 or 384-5212; meets Moncton Museum, 7:30 pm, 2nd Wed., Sept.-May; monthly newsletter

Nepisiquit Naturalists' Club, P.O. Box 385, Bathurst, N. B. E2A 3Z3

Saint John Naturalists' Club, 277 Douglas Avenue, Saint John, N.B. E2K 1E5; meets N.B. Museum, 2nd Wed., Sept.-May, elsewhere in June; monthly *Bulletin*

Valley Naturalists, P. O. Box 95, Florenceville, N.B. E0J 1K0; 375-6887 or 392-6485; meets Wicklow Agricultural Centre, 7:30 pm, 2nd Mon., Oct.-June; semi-annual newsletter

AFFILIATED ORGANIZATIONS / ORGANISATIONS AFFILIÉES

Schoodic Chapter, Maine Audubon Society, c/o Sid Bahr, Pembroke, ME. 04666; meets Sunrise Apts., Calais, 7 pm, 3rd Tues., except Dec; bimonthly *Schoodic*

Sunbury Shores Arts and Nature Centre, Inc., P.O. Box 100, St. Andrews, N. B. E0G 2X0; 529-3386; workshops, exhibits, semi-annual *Sunbury Notes*