

compare favourably with those of Digby County. The beauty and lustre of their skins, either red or black, with their noble brush, relieved by its snowy tip, must be our apology for hoping, notwithstanding he is the prince of vermin thieves, that the day is far off when he will be extinct in our pine-fir covers, or that a mandarin may not expend his fifty guineas to gratify his semi-barbarous tastes.

NOTE.—As this article is passing through the press, Capt. HARDY has given me a bat which from its inter-femoral membrane I think may be *V. evotis*. This will then give us three species.

ART. II. ON PROVINCIAL ACCLIMATIZATION. BY CAPT. HARDY,
R. A.

[*Read December 5, 1864.*]

THE very recent and ambiguous term, Acclimatization, implying the subjugation and domestication of wild races of animals; the transplanting of the useful or ornamental amongst nature's gifts in the animal or vegetable kingdoms, between various portions of the globe, for man's benefit; and the hybridization of species,—means but a continuation of the ceaseless efforts of civilized man to utilise and improve all things that were in the beginning created for his use, and placed under his dominion for that express purpose.

Accordingly we find that, in the most important branch of this wide field of experimental research—the domestication of animals,—nearly all the useful beasts, either of burden or for food, and in the various spheres most suitable to their existence in such a subordinate condition, have been thus turned to account from the remotest antiquity. In this branch, mediæval and even modern ages have witnessed no important additions to the classes of animals referred to, although the transplanting and interchange of species has taken place from time to time, and various breeds improved by crossing with foreign varieties. And so for a long time the civilized world rested on the successful, perhaps long-continued efforts of past ages, apparently content with its beasts of burden, its easily reared and fattened cattle, sheep and swine, its domestic poultry of ancient pedigree, and with the indigenous luxuries afforded by the game and

fish of its forests and waters. Variety of food has always been a desideratum on sanitary principles, but sufficient variety appears to have been attained in the well-known animals of the modern farm yard.*

On the other hand, when we turn to the vegetable world, we find that the efforts to domesticate wild species, either for food or ornament, have been continuous and ever-increasing. Forest trees and shrubs, plants with esculent roots, leaves or seeds, those possessing fibres capable of utilisation by manufacture, countless hosts of ornamental and flowering plants, have swelled the lists of modern botanical acclimatizers; and where the all-important condition of suitable climate did not exist, the necessary temperature for the plant's existence was obtained artificially. In accounting for this it will be easily seen how great a difference lies between the cultivation of a new plant and a new animal, thus giving so great a preponderance to the acclimatizers of new species of the vegetable kingdom, when it is remembered that the former demands but two conditions for life and health—the soil and climate of the centre of creation in which it was first placed, or of the natural boundaries to which it has in course of time spontaneously radiated; whilst the new animal does not succeed in any great dissimilarity of these two conditions, and imperatively demands association for the purposes of subsistence, with the same or most similar forms of vegetable life to those of the country where it is found as indigenous. The same argument applies to the transfer of fish to foreign waters, either salt or fresh; and here still greater research is to be inculcated before experimental acclimatization, as their peculiarities of habits and diet are so much less understood.

The recent discovery of the art of artificial hatching of the ova of fish, termed Pisciculture, the increasing frequency and popularity of zoological collections, and the successful experiments made in the

*Well authenticated modern cases of the transmission of large mammals from one country to another occur in the following instances: "The Reindeer was successfully introduced into Iceland about a century ago, while similar attempts failed, about the same time, in Scotland. The Cashmere or Thibet goat was brought to France a generation since, and succeeds well. The same or an allied species, and the Asiatic buffalo, were carried to South Carolina about the year 1850, and the former at least is thought likely to prove of permanent value in the United States. The Yak, or Tartar ox, seems to thrive in France, and success has attended the recent efforts to introduce the S. American Alpaca in Europe."—*Man and Nature*; by G. P. Marsh.

parks of wealthy individuals, in Great Britain and on the Continent, in breeding foreign deer, antelopes, &c., has given rise to extended popular movements in this direction, called Acclimatization Societies, in France, England, Germany, and the Australian colonies. The British Society has offshoots in various parts of the United Kingdom, in New Zealand, and in Palermo. These Societies are supported in some cases by voluntary subscriptions; others are aided by large legislative grants of money; whilst all receive great assistance from government in the free transit of animals, &c., by men-of-war; and in some cases grants of land for experimental parks or farms. The following enunciation of the purposes of the English Society, contained in the Rules, will afford a just conception of the ideas and intentions by which all are animated.

It aims, 1st, at the introduction, acclimatization, and domestication of mammals, birds, fishes, insects and vegetables, whether useful or ornamental.

2. The perfection, propagation, and hybridization, of creatures already domesticated.

3. The spread of indigenous and naturalized animals, &c., from parts of the United Kingdom where they are already known, to other localities where they are not known.

4. The procuring, whether by purchase, gift, or exchange, of animals, &c., from British colonies and foreign countries.

5. The transmission of animals, &c., from England to her colonies and foreign parts, in exchange for others sent from thence to the Society.

6. The holding of periodical meetings, and the publication of Reports and Transactions, for the purpose of spreading knowledge of acclimatization, and of inquiry into the cause of failure.

Without going into minute details of the establishments, their successes and failures, let us here briefly glance at what has been accomplished by these Societies in various portions of the globe during the past three or four years of their infancy. As might be expected, no complete success on so large a scale as to have passed beyond the nursing of the Society, has yet been recorded, whilst failures and disappointments have been numerous and heavy; yet the Societies are satisfied with their progress, and learning to look more to the necessary qualifications for successful acclimatization, are giving greater attention to a few subjects.

I have before me the Fourth Annual Report of the English Society for the year ending May 31, 1864. A most zealous member and promoter of the Society's objects, Lord Powerscourt, has successfully imported from a German forest a number of magnificent red deer, much larger than those at present found in Great Britain, and hopes by crossing to improve the breed of English red deer, which Mr. Frank Buckland says have been sadly degenerating in size, weight, and general appearance. Recently received specimens of the Wapiti, that magnificent American stag, and of large East Indian deer, are thriving in this nobleman's park.

Repeated failure seems to have attended the experiment of introducing the Chinese sheep, (the same as may be seen at Mr. Downs' establishment at the N. W. Arm). These animals have been disseminated through the country in charge of members, who have nearly all reported unfavorably of the pure breed, though where crossing has been tried there seems to have been more hopes of success. Amongst the birds mentioned as having been bred in the Society's care, are the Honduras turkies, bronze-wing pigeons from Queensland, and a variety of crosses between birds of the genus *Phasianidæ* have been obtained. Many other valuable birds from India, South America, and Australia, have been lately received, but have not yet bred. Amongst the latter are a pair of Australian emeus.

The most interesting portion of the Report, however, comes from the Piscicultural branch, under the guidance of the indefatigable Mr. Francis Francis. It appears that the cost of the apparatus and working it for one year has been only £300, and the Society has sent out amongst its members over 50,000 ova and fry. Many of these ova have been transmitted to the distant colonies of Australia and New Zealand, where the trout and salmon of the Old Country are now living, watched by anxious eyes, the hopeful pioneers of the new races which are to colonise the mountain streams of Tasmania and New Zealand. Of all the Societies in operation, those established by our energetic colonists of the southern hemisphere seem to have been actuated by the greatest zeal, and to have achieved the greatest amount of positive success. That of Melbourne appears to be the parent and first importer of the host of new creatures which are being diffused through the neighboring colonies, on the continent across the water to Tasmania, and even

to New Zealand. The last Report of this Society is so interesting, that it is scarcely possible, in noticing the achievements therein recorded, to refrain from giving the whole *in extenso*. Certainly, in no country on the face of the globe could acclimatization be more applicable, and hence the earnestness of its colonists in this matter. Australia possesses no indigenous ruminant, and scarcely a game bird beyond a variety of aquatic fowl; and the immense success of the introduction of sheep on its vast pasture lands, where no animal had browsed before from the creation, thereby giving the colony its staple product, wool, is in itself an earnest of the great advantages of acclimatization. After noticing the introduction and successful reproduction of the camel, a herd of which were brought from India at the expense of £120 per head, the llamas and alpacas from South America, Cashmere goats presented by the Paris Society, and various breeds of sheep, the Report goes on to say:—

“While devoting this amount of attention to such animals as the camel, the alpaca, the angora goat, and the sheep, which may be considered as more immediately interesting to the mercantile and pastoral classes, the sportsman has not been forgotten. The fallow deer, the Indian elk, the beautiful spotted axis deer, have been successfully imported, bred from, and turned loose at Wilson’s Promontory, the Wummera, the Sugarloaf, and the Bunjip. Numerous specimens of the hog-deer of India, a beautiful deer from Manilla, and another from Formosa, are still in the possession of the Society, with a view to their multiplication and ultimate release; and fresh importations of the deer tribe are almost of weekly occurrence.

“The hare has been sent to the Society by the Zoological Society of London, and has been turned out, and is now breeding freely on Philip Island. Various breeds of pheasants, partridges, grouse, and quail, have been introduced, and some have been liberated. Amongst those may be mentioned the Californian quail, which has bred after being liberated in the Botanical Gardens and Philip Island, and the Algerine sand-grouse, of which a considerable number have been imported, and which, from their hardy nature and the similarity of their original climate, may be considered highly adapted to this country. The English wild duck has been imported, has multiplied very freely, and now visits the lagoon at the botanical gardens in nearly equal numbers to the indigenous water fowl. The Egyptian goose has bred at the Royal Park, and promises to be thoroughly acclimatized. The wild pea fowl of Ceylon has thriven and bred in the charge of the Society, and can soon be set at liberty.—The white swan has been introduced in considerable numbers, has bred in the gardens of the Society, and is now distributed in various localities. Various kinds of foreign doves and pigeons have been introduced and liberated. The curassow has been obtained, and has bred in the aviaries of the botanical gardens.”

Then comes an enumeration of the various European pond and

river fish, successfully brought over the great intervening wastes of ocean by unremitting care, and including that great desideratum of these enterprising naturalists, the noble salmon, which, however, is expected to thrive and multiply to a far more remunerative extent in the bright cool streams of Tasmania, than in the sluggish rivers of the Australian continent; and lastly, a cheerful notice of the hosts of the common field birds of Old England, now spreading rapidly through the colony by natural means, enlivening the neighborhood of the towns, and doing infinite good to the agriculturists, by attacking the hosts of caterpillars and other insect pests which there prove so destructive to the crops.

As may be supposed, such extended operations could scarcely have been performed without greater assistance than that afforded by even a large assemblage of private subscribers. Indeed, though these have liberally contributed, the Melbourne government, recognizing the vast importance of these efforts to the future prospects of the country, have voted munificent sums to their furtherance. It is stated, that up to the date of the Report no less than £20,000 has been advanced by the government. Foreign Societies of a similar nature, seeing the zeal of the colonists and the aptitude and necessities of the country, have forwarded many new creatures;—indeed, the Report states, that a French man-of-war was at that time engaged in bringing the Society specimens of the yak, the ostrich, and other animals.

There are besides, Societies on the model of that of Victoria, in Sydney, Hobart Town, Adelaide, Brisbane, Auckland, Lyttleton, and Dunedin. So that it may be presumed that in a quarter of a century the strange and sparse fauna of these vast antipodal possessions, will be supplanted by all those beautiful forms of animal life which are so essential to the prosperity and happiness of man in his highest state of civilization, affording variety in food, gratification to the eye, and excitement and health in the chase.

Such then are some of the most important statistics of Acclimatization. That our mother country regards its advantages as far from uncertain or insignificant, may be seen in the fact of her having placed Her Majesty's ships at the disposal of the colonies for transport of specimens. Doubtless the introduction of a new creature in such numbers as to become eventually a common deni-

zen of the country, either wild or in a state of domestication, requires great forethought as regards the aptitude to dwell and thrive in a new home, by comparing the conditions of its past existence with those under which it is expected to live in future. Indeed, without such proper knowledge of the minuter habits and requirements of animals, failure is inevitable ; but more than enough has been shown to establish it beyond cavil as a branch of science, a practical offshoot of the interesting science of natural history.*

We now come to consider the proper subject of this paper—the question of Provincial Acclimatization as applicable to Nova Scotia. I have so far drawn attention to the advances made by the antipodal colonists in this direction, to show how the objections of distance, expense and uncertainty of results, have all been put aside for ends thought worthy of such sacrifices. But Australia was a country craving animal immigration, her large and wealthy population demanding many of the absent table luxuries of the old world, and her youth eager for the time when the boundless forests and grassy plains should abound with the stag or roe, in place of the monotonous marsupials which as yet had afforded the only material for the chase. In Atlantic America, on the contrary, instead of having to supplant the indigenous animals, we possess, in a state of nature, some of the noblest forms of animal life, which no longer called upon to supply the aboriginal Indians with their sole means of subsistence, may be called on with that moderation which should always characterize a civilized people, to afford both the invigorating pleasures of sport and luxuries for the markets. Every stream and lake abounds with trout, and there are but few rivers from Cape Sable to the Labrador which the salmon does not annually attempt to ascend.

What then is to be desired ? Has not America, receiving from the east all those useful animals which accompany man in his migrations, and which, returning to a state of nature in the plains of Mexico and South America, have multiplied so greatly as to afford a staple product for exportation, given all imaginable luxuries to the new-coming nations in the produce of her forests, prairies, rivers, and sea coasts ? Yes, but the gift has been abused. It is sad to contemplate the wanton destruction of game and game fish

* Applied Natural History it has sometimes been termed.

throughout the northern continent since its first settlement by Europeans: many animals, now on the verge of extinction, driven off their still large domains, not primarily by the approach of civilization, but by ruthless, wholesale and wanton modes of destruction. "One invariable peculiarity of the American people," says the author of *The Game Fish of the North*, "is that they attack, overturn, and annihilate, and then laboriously reconstruct. Our first farmers chopped down the forests and shade trees, took crop after crop of the same kind from the land, exhausted the soil, and made bare the country; they hunted and fished, destroying first the wild animals, then the birds, and finally the fish, till in many places these ceased utterly from the face of the earth; and then, when they had finished their work, that race of gentlemen moved west to renew the same course of destruction. After them came the restorers; they manured the land, left it fallow, put in practice the rotation of crops, planted shade and fruit trees, discovered that birds were useful in destroying insects and worms, passed laws to protect them where they were not utterly extinct, as with the pinnated grouse of Pennsylvania and Long Island, and will I predict, ere long re-stock the streams, rivers and ponds, with the best of the fish that once inhabited them."

A home question for our subject would be,—In the hands of which class of men does this Colony now find itself? And I fear the unhesitating answer of the impartial stranger and visitor would be, that in all regarding the preservation of our living natural resources, we were in the hands of the destroyers. The course of destruction so ably depicted by the author quoted, is being prosecuted throughout the length and breadth of Nova Scotia, and the settlers of this Province blind to their own interests, careless of their children, and utterly regardless of restraint imposed by the laws of the country, worse than useless because not carried out, are bringing about the final depopulation of our large wild lands and waters. It really becomes a question as to whether late interference shall arrest the tide of destruction ere the entire extermination of fish and game shall bring the country to a sense of its loss, and finally to a wish for their reproduction.

In such a state of affairs, Provincial Acclimatization would prove an empty speculation, for any new animal or bird introduced into

our woodlands requiring freedom from molestation for a term of years, would be quickly hunted down and destroyed.

Leaving, however, these important questions of protection or extinction of already-existing indigenous species in the hands of those who hold the means of ordering these matters, I will now call your attention to what might be done to increase our stock of useful wild or domestic animals, birds or fish, could they be insured the necessary wardship. We will consider first whether our large woodland districts demand and would bear foreign colonization, and for what types their physical conformation seems best adapted.

Even in its most undisturbed and wildest depths the North American forest has always been noted for its solitude ; the meaning being the great disproportion of the animal to the vegetable kingdom. It seems as if nature had exhausted her energies in shading the ground with the dense forest and the rank vegetation which every where seizes on the rough surface beneath. It is impossible to say to what extent animal life might have once existed in the primeval forest ; but no one who has taken a day's walk in the woods, either near to or far from the haunts of man, can fail being impressed with the apparent absence of animal life. The European visitor, in a suburban ramble through the bush, wonders at the scarcity of game birds, rabbits, or hares, but is astonished when told that in the deepest recesses of the wild country he will see but little increase of their numbers. A canoe paddled through lake after lake of our great highways of water communication, will see but a few pairs or broods of exceedingly timid waterfowl, where in Europe they would literally swarm. Surely then, here is room for the work of Acclimatization, in a country where so much toil is undergone in the often fruitless pursuit of sport.

The undergrowth of our wild forest lands, the field for Acclimatization which we have under immediate consideration, consists of an immense variety of shrubs, under-shrubs, and herbs, annual or perennial. The under-shrubs generally bear the various descriptions of berries, and with great profusion. There are here and there wild pastures, or intervalles, by the edge of sluggish water, but they bear but a small proportion to the woodlands ; the bogs and barrens produce moss in abundance, and of the kind found in every part of the world where the reindeer is indigenous, or has been successfully introduced, as in Iceland.

We find accordingly, that our largest ruminant, the moose-deer, is in the strictest sense of the word a wood-eater; whilst our other animal representing this class, the American reindeer, or cariboo, is found in those portions of the Province where large and seldom disturbed plains and bogs afford him his favorite moss, the lichen (*rangæ ferinus*). As amongst the larger animals, ruminants alone offer a selection for introduction into a forest country with the physical attributes of Nova Scotia, we may ask if there is any other animal of the deer tribe which might be successfully acclimatized here. The answer comes through careful consideration of the fauna and flora of other regions compared with our own. The field naturally presenting itself for this research lies in the forest districts of America further west, and in northern Europe, which, under similar climatic influences, presents a strong analogy to this portion of the globe, especially on its western seaboard; the forest trees and shrubs, the larger animals, the birds and the fish of Norway and Sweden, are almost reproduced in British North America; indeed, distinction of species in many cases is far from established.

*The red deer then, of Maine and the Canadas, and more recently of New Brunswick, by spontaneous acclimatization, or perhaps rather through the instrumentality of the wolf, appears to be perfectly adapted for an existence in the Nova Scotian woods—a graceful species, but little inferior to the red deer of Europe, affording the excellent venison with which the New York and Boston markets are so well supplied. The climate of Nova Scotia, allowing so little snow to accumulate in the woods until the close of the winter, would prove a great safeguard against the wholesale destruction with which it meets in Maine and New Brunswick, where it is continually in a most helpless condition from the depth of snow throughout the winter. Indeed, it is already with us, for a small herd of healthy animals may now be seen at Mr. Downs' gardens, to whom the country is already indebted for many an unassisted attempt at real practical acclimatization.

The only other ruminant on the list of this order indigenous to climates similar to our own, is the hardy little roe-deer or roe-buck, common in the beech woods of northern Europe. I am confident

* *Cervus Virginianus*.

that this animal would thrive in the hard woods of Cumberland; and as it seems to live and thrive close to civilization, it would find ample room and food in our suburban copses and uncleared barrens. Descending in the scale of animal classification, the next selections for consideration of a future Acclimatization Society in this country, as adapted to live and multiply and become profitable in the woodlands, seem to be offered in the prolific order *Rodentia*, of which many families are already indigenous—the squirrel, beaver, porcupine and American hare, commonly known as the rabbit. The first of these might receive an interesting accession by the introduction of the black and grey squirrels of Canada and the States; the beaver, porcupine and woodchuck, are all prized by the hunter as food, lacking the supply of venison, and the latter, persecuted though it be by human, furred, and feathered foes, is still so prolific and common, as to form a great portion of the winter subsistence of both settlers and the poor of this city. Indeed, when we enumerate its enemies of the animal creation, which almost altogether live upon it, the lynx and wild cat, the foxes, the horned owl, the marten and the weasel, and take into consideration the numbers which are taken by man, by snaring them in their easily discovered paths to and from their feeding grounds in the swamps, it is wonderful that they still remain so plentiful. A great objection to the flesh of the American hare, however, is its insipidity and toughness, except when taken young. Far more delicate and esteemed is that of the Spanish, or domestic, and common wild English rabbit, (*Lepus cuniculus*), whilst it would seem that both are of a sufficiently hardy constitution to stand the rigours of our winter. The former is already an acclimatized inhabitant of the sand banks of Sable Island, according to Dr. GILPIN, having been introduced by the honble. Michael Wallace, and increased amazingly, affording the Islanders many a fresh dinner when salt junk is plenty and fresh beef scarce. No easier experiment could be made in applied Natural History, than the extensive breeding of the common grey rabbit by some resident near town, whose premises bordered on uncleared bush or scrub. To commence, a large bank of loosely piled earth and stone might be made, here and there perforated by a length or so of suitable tubing, such as used for drains, the bank enclosed by wire netting, and a few

pairs of rabbits turned in. They would soon tunnel the bank in all directions, and as the families increased they might be allowed to escape into the neighbourhood. A fair warren once established would be the means of a quick colonization of the surrounding country. And the true rabbit living so constantly under ground, would enjoy much greater security from animals and birds of prey than his indigenous congeners.

Still keeping in view the acclimatization of creatures intended to exist in a state of nature and not for domestication, a division of the subject which appears to be most feasible and best adapted to the condition of this Province, let us next turn to the birds.

We have already existing in our woods as game birds, two species of *Tetraonidæ*, or the partridge tribe; the *T. umbellus*, or the ruffed grouse; and the *T. Canadensis*, or spruce partridge—as permanent residents; and as summer visitors the two N. American *Scolopacidæ*, the woodcock and snipe. There is but one representative of the *Phasianidæ*, or pheasant tribe, in North America, the only gift of the new to the old world, whence the domestic race has sprung, and that is the wild turkey. It certainly would appear that our large woodland solitudes offer especial facilities for the introduction of some new members of the grouse family, birds especially formed for existence in cold climates. Formerly common in the Scotch pine forests, now only to be met with in the north of Europe, in Norway, Sweden, and Russia, the magnificent capercaillie or cock of the wood, (*T. urogallus*,) equalling, in the case of the male bird, the turkey in size, presents so tempting an experiment that it should be almost introduced regardless of expense. It appears to feed exclusively on pine shoots. Mr. Bernard, author of a recent work called “Sport in Norway,” says it is still common in all large forest districts in that country. I believe this bird loves solitude, and surely he would find it, if essential to his existence, in some of the great expanses of coniferous forest which still prevail in most portions of Nova Scotia. Next in size and beauty might be selected the black game (*T. Tetrix*) of the wilder portions of the British Isles, and numerous in Norway, where it is stated they not unfrequently cross with the capercaillie. This bird is known to subsist on the buds and seeds of the alder, on the berries of the whortleberry, and on the bog cranberry, all of which are so abun-

dant in our woods, and of almost identical species. A successful introduction of this bold, handsome grouse, would add great interest to the wild sports on the open barrens. The hazel hen of northern Europe, (*T. bonasia*), reported to be the best fleshed bird of the grouse tribe, is another association of a country in which spruce woods abound. It is exceedingly like our birch partridge in appearance—a little smaller and wanting the ruff; like the latter, also, its flesh is white. There are many other northern grouse in both the old and new worlds, but none that I should import as so likely to succeed, and as such valuable acquisitions, as the capercaillie and the black cock.

With the fact of the introduction and breeding of the English and gold and silver pheasants at Mr. DOWNS' establishment we are all acquainted; and the most interesting fact is the well-ascertained capability of the English pheasant to live and find its own subsistence in our woods through a rigorous winter. Why should not this experiment be continued?

It is to be feared that those troops of little songsters with which the fields of England abound, and which have been carefully acclimatized in Australia for old association sake, would die on the first near approach of the mercury to zero. Those that are imported are closely kept within doors. Mr. DOWNS has two pairs of the European jackdaw, which he hopes will increase in his neighbourhood. These interesting and garrulous little members of the family *Corvidæ*, whose young every English boy covets to obtain and educate to the acquisition of rudimentary speech, would find but few ivy-mantled towers or venerable steeples in which to build their nests; but when Gilbert White informs that for want of church steeples they will build under ground in rabbit burrows, the new-comers would not be long in devising a remedy for the defect.

As a second consideration in connection with this wide subject, let us enquire whether any good purpose could be answered by an attempt at domestication or semi-domestication of our indigenous ruminants, the moose and the cariboo. When we consider that these two species are found throughout the old world, under the same conditions of climate and vegetation which attend them in the new, it appears unaccountable that we have no historic records of the subjugation of the cariboo for domestic purposes by the prim-

itive Indians of the northern coasts of America, as this animal has been applied from time immemorial by the Lapps.

An eminent naturalist, Dr. Gray, in delivering his address in the Nat. Hist. Section at the late meeting of the British Association at Bath, thus alludes to the latter fact : "The inhabitants of the arctic or sub-arctic regions of Europe and Asia have partially domesticated the reindeer; and either Asiatics have peculiar aptitude for domesticating animals, or the ruminants of that part of the world are peculiarly adapted for domestication;" and he then instances a variety of exemplifications, in their having domesticated the yak in the mountain regions of Thibet and Siberia, the camel and dromedary in central Asia, in southern Asia the zebra, and in the Malayan archipelago various species of buffalo and wild cattle. It may be stated, that modern geological discovery has placed the original home of the reindeer in the high Alps of central Asia, whence these animals, followed by their ever-accompanying human associates, the Lapps, migrated to the northwest of Europe. As a beast of burden, however, to traverse those treeless wastes answering to the snow-covered barrens of Lapland, the dog seems to have answered all the purposes of the Esquimaux and other arctic-American tribes, whilst in more southerly and wooded regions, a sledge-drawing animal would have no scope or sphere of employment. And viewing the animals in this light, the horse and the ox which have accompanied Europeans, have left no desideratum that could be supplied by either the moose or the cariboo. There are, however, several undoubted instances of the applicability of the moose to draught. A few years since a settler on the Guysboro' road, named Carr, possessed a two-year old bull moose, which was perfectly tractable in harness. For a wager, he has been known to overtake and quickly distance the fastest trotting horse on the road, drawing his master in a sleigh, the guiding reins being fastened to a muzzle bound round the animal's nose. Another instance was that of a very large moose kept by a doctor in Cape Breton, which he would invariably employ in preference to his horse when wishing to make a distant visit to a patient, and in the shortest time. It is very certain that in its youth the moose is one of the most tractable of animals; but it is in the rutting season

of the third year that the males become unmanageable and dangerous.*

The point, however, on which I wish to engage attention, is not the domestication of either of these animals in the state in which the ordinary domesticated animals are associated with us, but a possible state of semi-domestication, by which the moose might be caused to multiply on uncleared land, and regularly bred, fattened, and turned to profit without the smallest cost to the owner, except the expense of maintaining his enclosures in an efficient state of security. My attention was first drawn to this by reading an account of the successful breeding of the American elk (*C. Wapiti*) by an American gentleman, a Mr. Stratton, of New York State. I quote from a letter dated January 12, 1859:

“My desire to keep and breed them, without their becoming a tax upon me, led to diligent enquiry in relation to what had been done in the way of their domestication. I procured, as far as possible, every paper, book, and document, which could give any light upon the subject. I wrote to every part of the country whence any information could be obtained, and opened a correspondence with those who had undertaken such an enterprise. The result of my efforts was simply this: nearly every one who had owned an elk was a gentleman amateur, and had left the care and direction to servants;—that the bucks, not having been castrated at the proper age, had become unmanageable:—and when the novelty of the attempt was over, the domestication in most cases was abandoned. But from my own inquiries, and a close personal observation of the habits of the animal, I believed that a different course would produce a more favorable result. The first requisite was a place to keep them in. Now, they had always lived in the woods, summer and winter: why not live in the forest again? Acting on this principle, I immediately set to work and fenced in about 150 acres of hill land, which was steep and stony, covered with brushwood and entirely useless for agricultural purposes. In this lot I turned my elks, where they have been six years. In the mean time I purchased two more does, and have reared eight fawns. Having emasculated the older bucks as fast as the younger ones became adults, I have now a herd so gentle, that a visitor at my farm would hardly imagine that their ancestors, only three generations back, were wild animals. And this has been done simply by visiting the park two or three times a week, and always carrying them an ear of corn, some little delicacy, or salt, and treating them with unvarying kindness.

“The facility for extending this business may easily be conceived. New York alone might support 100,000 elks on land where our domestic cattle could not subsist, furnishing an amount of venison almost

* Formerly the elk of Europe was used in Sweden to draw sledges, but his use for this purpose was finally prohibited by government, as criminals used it as a means of escape.

incredible; while the adjoining State of Pennsylvania, to say nothing of others, might sustain a still larger number without encroaching upon an acre of land now used for stock-rearing, or any other purpose connected with agriculture.”*

Here, then, we have a modern precedent for an experiment which I am convinced would answer in the case of the moose, a still larger and more profitable animal than the wapiti. What an admirable opportunity for utilizing those barren wastes which surround us! Take for example that large triangular piece of waste country commencing at Dartmouth, extending along the shores of the Basin on one side, bounded by the Dartmouth lakes on the other, and skirted by the railroad from Bedford to Grand Lake as its base. With the exception of a few clearings on the shores of the Basin, the whole of this is a wilderness, containing some 13,000 acres of wild, undulating land, with here and there thick spruce swamps, mossy bogs, and barrens covered with a young growth of birch, poplar, and all the food on which the moose delights to subsist. That they have an especial liking for this small district may be gathered from the fact that I have never known it as not containing two or three of these animals. There is no reason why an experimental farm, conducted on the principle followed by Mr. Stratton, should not be able to breed and turn out into this district a very large number of moose, and in such a state of tameness that they would be induced to remain within enclosed portions of the wilderness, furnishing, in proper season, a profitable supply of flesh for the market.

To the cariboo, on the other hand, these suggestions will not be applicable, as this animal requires, as a primary condition of its existence, a large and uninterrupted field for periodical migration.

ART. III. NOTICE OF THE OCCURRENCE OF HEATHER (*Calluna vulgaris*) AT ST. ANN'S BAY, CAPE BRETON ISLAND. BY GEO. LAWSON, PH. D., L. L. D., *Professor of Chemistry, Dalhousie College.*

[*Read December 5, 1864*]

It gives me much pleasure to bring under the notice of members of the Institute, information and specimens which will, I trust,

*In 1862. Mr. Stratton states that he had succeeded in raising thirty-seven elk. He had trained a pair to harness, and had sold them for \$1,000. Whilst, as an article of food he can now raise elk cheaper than sheep.