

University of Dalhousie
Halifax Nova Scotia May 26th 1864

Professor Edwards

Dear Sir

Though personally unknown to you I have ventured to address you with the view of partially cancelling a debt of some standing but which circumstances prevented me acknowledging at an earlier period. A few years ago I visited Paris for the purpose of availing myself of the facilities which your Educational Institutions so generously accord to strangers. Among other courses I had the privilege of attending your lectures on Comparative Anatomy and I need scarcely say how intensely interesting and gratifying they were found by one with whom since childhood the study of Natural History has been a passion. Before leaving I would have tendered you my services as I felt and still feel myself deeply indebted to you but I shrank from doing so lest it might be regarded as an intrusion. Permit me now to say that if I can be of any use to you in this quarter in the advancement of your favorite pursuits you have merely to indicate the direction and your wishes shall be met to the utmost of my ability. My collections in the different departments of the Natural History of our Province are both varied and extensive and if I can meet any desiderata with you they require only to be mentioned. In the Fauna and Flora of this region they are I believe the most extensive in the Northern Colonies. In natural Shells Zoophytes and insects they are also highly respectable. In the last mentioned class my collections are rich in duplicates. Since my return I have been engaged in completing a private Survey of the Botany of Nova Scotia commenced some years ago but interrupted repeatedly by impaired health and other causes. Though far from finished my researches have been highly satisfactory and if a collection of the flora of Nova Scotia (land and marine) would be deemed worth your acceptance it would afford me no little pleasure to forward you one at the close of the coming season. You no doubt have many of our plants from other regions but it might be of interest with respect to the distribution of many species—a point on which some of our best authorities have erred egregiously.

Though considerably to the north of New England we have in our flora almost all the Orchids found in that region.

While listening to your deeply interesting lectures on the Circulation of the blood in different ^{animals} a fact relative to the young of the *Totanus macularius* often occurred to me and which I would have liked exceedingly to have brought under your notice. Though familiar to me from childhood it has not in as far as I am aware been mentioned by any writer not even by my venerable friend Audubon whose graphic pen and pencil exhausted almost every subject which he undertook to illustrate. The circumstance alluded to is the habit which the young of the *Totanus* have of plunging like frogs into water on the approach of danger. While there they either walk on the bottom with perfect ease or swim below the surface using their partially expanded wings to aid their escapes and in this way they crop large ponds and very rapid streams. Though I have made numerous observations on this curious habit I have not yet ascertained the precise times that these birds are capable of remaining immersed but may possibly do so during the ensuing season. In reference to their power of endurance however I may mention that it is certainly greater than that of any water bird with which I am acquainted. This curious disposition is manifested from the moment the birds leave the nest until fully grown, but the disposition to remain under water seems to diminish as the birds approach maturity but whether the power is actually impaired by constitutional changes or merely less relied upon when capable of flight I am not prepared to venture an opinion. The parent birds show no such tendency but they are evidently quite aware of the security which it affords their brood. The instinct I believe is always present in the young birds and it sometimes though very rarely occurs that they find themselves incapable of plunging beneath the surface. In cases of this kind when the disposition has probably been corrected by experience I have known full grown birds allow themselves to be captured rather than take to the water.

Near this additional provision for the permanence of the Species be attributable to the temporary continuance of the mode of circulation which obtains previous to birth Should you deem the circumstances worthy of more particular investigation I could forward you some of the young in Spirits

I have enclosed the Photograph of a fossil from the Lower Carboniferous system in our Province I observed nothing like it in any of the collections in Paris and elsewhere and should it prove of interest I can supply you with specimens I have traced the structures in question over an area of upwards of ten miles in length and so numerous are they in some localities that ship loads of them could be procured the shore at certain points being literally paved with them In only one spot however in the whole area mentioned and even in that within very narrow limits do they exhibit the pattern or face which the picture presents All the others seem closed or dormant as sealed hermetically but it can readily be obtained by breaking them either vertically or in the opposite direction The white lines are vertical plates of pure carbonate of Lime the dark interspaces being composed of the same slate as the beds in which the masses lie Besides these vertical plates the structures are traversed at irregular distances by very thin plates of Carb. of Lime which cover the entire space under the pattern but do not encroach on the envelope or crust The latter plates when subjected to a low power of the Microscope present a series of ^{minute} cells which coincide in shape with the divisions on the face of the mass The structures themselves are most grotesque in shape naturally ^{so} to appearance and not the result of compression or similar causes Usually they resemble huge gourds somewhat flattened again they are found nearly spherical or like a hemisphere while though now rarely they have the form of cones In size again they are just as variable - some must weigh fully half a ton while others cannot exceed a half of a pound ^{in weight} The young are exceedingly rare but some specimens in my possession are scarcely larger than a five franc piece If my remarks are applicable to a known object I trust that you will excuse me

if they are not they may be of some use in determining the true character of the
structures themselves. The picture represents a specimen about fifteen inches long by
nine broad. The face is perfectly flat, but the opposite side curves
trusting that my object will form some apology for my pre-
sent intrusion I remain in the mean time

Yours very gratefully
Thomas McCulloch