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AN ADDRESS

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BY

PROFESSOR JOHNSTON.

[*Reported by* G. BLATCHFORD, *Esq., Barrister at Law*

MR CHAIRMAN, LADIES AND GENTLEMEN,—In appearing before you on the present occasion, I have first to apologise to you, for the disappointment which, two weeks ago, unavoidable circumstances compelled me to cause you. I assure you that the accident an uncommon sudden change of weather, combined with other impediments, which prevented my fulfilling my engagement at that time was to me a source of very great regret, and you will readily understand that it must have been peculiarly so, from the circumstance, that although I have addressed many audiences in various parts of the world, yet I never disappointed an audience before. However I believe you will perhaps think with me, that the disappointment then involuntarily inflicted on you will be compensated, and my address to you rendered more agreeable by the postponement; inasmuch as, since that time, I have obtained permission of His Excellency the Lieutenant Governor and other authorities to lay before you a abstract of my enquiries with regard to the Agricultural capabilities of this Province, as comprised in my written Report. If I had addressed you when first intended, it would have been only on more general topics; topics, perhaps, more suited to your taste, but less interesting in the discussion than that which I shall now present to your notice; and, therefore, we may be induced to believe, that disappointment, like many other equal vexations and grievance in life was really intended for our good.

I have been much occupied during the last six weeks, in putting together the results of my observations and enquiries in this Province, in the form of a Report, that I have had no opportunity to prepare any thing special for this evening; but I propose to give you a brief outline of the direction of my enquiries and of the results obtained from them.—This I shall do in plain, homespun language, devoid of ornament or imagery, so that you may fully understand the subject; and you will then make allowance for any want of strength or polish, and for the absence of flowers of language and oratory.

In looking at the agricultural capabilities of any country it is of the greatest consequence to a person taking a general view of it, to have an idea, before hand, of what is the Geological structure of that country. In a former address in this place it will be remembered by those who were present, that I drew the attention of the audience to this point; that a knowledge of the geological structure of a country is the greatest possible consequence, to enable any one to arrive at anything like general conclusions with regard to the agricultural capabilities of that country. When I tell you that from an inspection of the geological maps of other countries, countries which I have not personally visited, I am enabled to judge of the agricultural capabilities of those countries, and not only to judge of those capabilities as a whole, but also to instruct others as to the kinds of husbandry most suited to the various soils of such countries, you will have an idea of the value of a knowledge of what is called the geological structure of a country and this knowledge you may obtain by looking at geological maps. If you look at this Geological Map of the Province of New-Brunswick now exhibited before you, (which I have had prepared, to attach to my own Report on this Province,) you will see that there are various portions of its surface colored with different colors; and those colors represent the different species of rocks which prevail in the various districts of the Province. Now you all know, that if you dig beneath the surface of the earth at any place you will come at a lesser or greater depth, to the solid rock. The solid rock varies in species in various parts of every country, and Geologists have given different names to the various species of rock, such as sandstone, trap, grey-wacke, limestone, and many others. This system of the various kinds of rocks constitutes what is called "geological formation;" and this geological formation or structure of a country is exhibited on maps by different colors, the various colors representing the various geological formations or species of rocks. The map now before you thus exhibits the geological formations that occur in the Province of New Brunswick; and I have been anxious to embody in one map, all the information hitherto collected as to the geological formation of this Province, by previous investigators as well as by myself. Dr. Gesner has often addressed you from this place on this subject; he was employed for several years at the expense of the Province in making geological explorations of the country, and he published a series of reports of the results of his enquiries, which no doubt, contain many valuable facts and observations. But unfortunately, though those facts and observations are to a certain extent embodied in this map, yet it is still exceedingly incomplete. I have had all the available observations of Dr. Gesner, as well as my own observations and those of Dr Robb embodied in this map; and although it is still incomplete, yet it will afford more information on the subject than has ever yet been obtained; and here I cannot help remarking, that a large amount of valuable information on this head is deposited in the Crown Land Office of this Province, and it seems to me surprising, that information for which such large sums have been paid by the Provincial Government, should up to this moment have lain hidden in a Government office.

We have now noticed the fact of the various kinds of rock: the next principle to consider is, that every rock with which we are acquainted, when exposed to the action of the air, gradually undergoes a crumbling process; it becomes as it were, degraded, and is converted from a solid mass into minute portions of matter, which, by the chemical operation of the atmosphere and other combinations, in course of time, form gravel, mud, clay, sand, &c., and on the top of these loose materials eventually the soil is formed.—Now, soils are of various kinds, according to the nature of the materials from which they have been formed. You will see, on this map, between the broad red belt which stretches diagonally across it, and the patch of lighter red in the corner below, a large tract of surface colored grey: these colors represent different kinds of soil; and you will observe, that this large tract of land colored grey, is covered with loose materials forming a soil totally different from that which is formed by the materials from the red rock or sandstone. Therefore it is important in taking a general view of the agricultural capabilities of a country to know, the character of the soil and the quality of the rocks of which that soil is formed.

The first chapter of my Report comprehends the study of the geological structure of this country, in relation to its agricultural capabilities and the qualities of its various soils. I describe those qualities and capabilities; and when you read it, you will see that the Government, which in former years expended large sums of money in encouraging explorations and in endeavoring to make out the geological structure of the Province, have not only done a thing of great importance and service to the country at large, but have really laid out this money in a way which ultimately (and more especially would it, if the project had been satisfactorily completed) will repay itself, which will actually benefit the pockets of those who cultivate the soil of the country; because the knowledge thus obtained will hereafter enable them to know how the soil is composed, and how it can most advantageously be improved by cultivation. By this map you will be able to tell where good soil and where bad soil is to be met with; and it will thus be practically beneficial to proprietors and future purchasers of land. I have now briefly noticed the general description of the soil as demonstrated by the geological formation of the country; and I have thought it proper to begin my Report with this introductory chapter, as a preface to the rest of my examination of the agricultural capabilities of the Province, in order to give to science that prominence which it deserves, which is desirable in every practicable work of this kind, and which will render the other portions most profitable and beneficial. I now dismiss that chapter.

In my next chapter, we turn to the real, the actual productiveness of the country, or the actual value of the soil as determined by personal inspection. If you look at this *second* map here exhibited, you will see certain green lines running in every direction. These lines represent the country which I have personally gone over. I assure you I have found it no little fatigue, to travel two thousand miles in New Brunswick, in the short time that I have had for the purpose: and I would not recommend some of you to go over it in the manner that I have gone over it: were you to do so, doubtless you would meet with as remarkable adventures and various disagreeables as I have met with; but perhaps you would take a longer time in performing the journey so as to render it less fatiguing. And here I cannot help observing, that in no part of the world that I have ever been in, has it appeared to me that the people in general understood the value of time less than they do in this Province; the inhabitants of New Brunswick certainly cannot find it necessary to work as hard as the people do in Europe, or they would understand the value of time better. The relative value of the soil in different parts of the Province, I have ascertained by personal observation; and I have represented on this map, by the figures 1, 2, 3, 4, the various qualities of the soil in different parts of the Province, not as deduced from the geological map, but from my own personal observation; and I have called the attention of the readers of my Report to the difference of the value of the soil, as indicated by both the geological structure and by personal examination: and thus you will see the value, in an economical point of view, of such a demonstration and comparison.—In making this elucidation I have also been indebted to whole cart-loads of Reports lying up in the Land office, and have thus endeavored to embody on this map all that any person with good eyes and ordinary understanding has been able to observe and report on this subject. If you look at this *third* map now exhibited, you will see that the same thing is represented by colors; the five different colors represent the various qualities of the soil in this Province, and thus you may see at a glance the localities of the best and worst soil in the Province.—The first quality (colored *dark red*) comprises the rich intervales and islands on the River St. John and the marshes about Sackville and its vicinity, and those to be found to a smaller extent in other parts of the Province, which, altogether do not amount to more than fifty thousand acres in the whole Province. The *light red* color, you see, prevails in the counties of Carleton and Restigouche and at Sussex Vale in King's County; the color represents the second quality of soil; the first quality (the dark red color) being the richest soil in the Province. The third color on the map is *blue* and comprises a very large portion of the Province; this is second class upland and includes nearly seven millions of acres. The *darker yellow* colour comprises about five millions of acres; and the *lighter yellow* (being soils at present unfit for cultivation) also about five millions. Altogether there are about eighteen millions of acres of which thirteen millions are fit for cultivation, and five millions are, in their present condition, unfit for agricultural operations.

I have next endeavored to arrive at an idea of the comparative productiveness of these different soils. It is necessary to know how much human life an acre will support; and in order to arrive at that, I have classified the soils according to their relative productiveness: and the standard which I have taken is this:—in this country the common mode of judging of the value of the land is by the number of tons of hay which it will produce. I have therefore in the first place taken this as a standard for calculation. I have taken this small quantity of first quality land in the Province, (the rich intervale land,) which is only fifty thousand acres, as producing two and a half tons of hay per acre; the next quality at two tons per acre; the third quality at one and a half ton per acre; and the fourth at one ton per acre; and supposing that these different qualities of soil produce at that rate, that this is their absolute value. The fifth or lowest kind of soil we throw out, as not being capable of paying for cultivation.

The next standard is that of *cattle*.—We know that a horse of a cow will eat so many tons of hay in a year; therefore, if we know how many tons of hay the land will produce, we have no difficulty in ascertaining how many cattle it will support. But the next question is, how many men will the land support? To arrive at this, we must take some standard, some kind of food for men. I have taken *oats* as this standard; of all grain, oats thrive best in this Province; they are therefore the proper staple grain of the Province. What changes in the relative production of the various grains in this country, may result from continual clearances of the land and consequent changes of climate, we cannot tell; but at present oats are the most sure crop in this country. The principle then is this: that the land that will grow a ton of hay will grow twenty bushels of oats; one is equal to the other; thus 50, 40, 30 and 20 bushels of oats per acre will represent the different ratio of productiveness of the various qualities of the land. We then estimate the quantity of oats necessary to support a man. This is very well known, because it is a common article of food, especially in Scotland, where it is a staple of life. Then we estimate the quantity of oats necessary to support the whole population of the Province; in doing which we allow so much per head for young and old, varying according to age, and taking the average of the whole. Then we take the whole population of the Province, which is about 210,000 people as far as known at present. Of horses and cattle there are about 150,000, and sheep and pigs we estimate at 250,000. Taking all these together, we can calculate what proportion of land is required to support the human inhabitants and the stock of cattle respectively, if they continue in the same relative proportions as at present. Taking this, then, as the existing average, the result is this: calculating upon the principles already laid down, and leaving out of consideration the five millions of acres of unproductive land, we find that the soil of this Province is qualified to maintain 4,620,000 human beings, together with 3, 300,000 horses and cattle, and 5,500,000 sheep and pigs, supposing all the cultivable land to be cultivated, and to produce in the same proportion as the land at present cultivated in the Province. But I must observe, that in taking this basis for my calculations I do not speak of the ratio of produce only as an opinion of my own, but as the result of enquiries made in the Province; if, therefore I am wrong in my information, I am not to blame for it; I make my calculations only on the basis of the information afforded me by others; and therefore I want to guard myself against being held responsible for that information. According to the best