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AGRICULTURE.

REPORT ON THE AGRICULTURAL CAPABILITIES OF THE PROVINCE OF NEW BRUNSWICK.

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(Continued from our last.

C. *The Lower Silurian Rocks* occur abundantly in Canada East, forming the northern part of Gaspe, and skirting the right shores of the Saint Lawrence for a great distance. Like the Upper Silurian strata they consist to a great extent of slaty rocks, more or less hard, and though not incapable of yielding rich soils, as is seen in the occasional productive valleys of Lower Canada, yet as they exist in New Brunswick they are covered for the most part with inferior soils.

In the annexed Geological Map they are coloured dark purple, and are seen only along the southern limits of the Province, skirting the Bay of Funday in the Counties of Charlotte and Saint John. The agricultural reputation of these Counties, and the colours and numbers on the agricultural Maps, shew that there is much general accuracy in the Geological indications.

D. *The Cambrian or Clay Slate Rocks*, coloured pale blue in the Geological Map, form two bands, of which the limits are not well defined, running in a north easterly direction across the middle of the Province, the more southerly of which bands doubles round the south western extremity of the coal measures, or coal basin as it has been called, and forms part of Charlotte, Saint John, and King's Counties. In nearly all countries these clay slate rocks are harder, less easily decomposed, and form more rocky and inhospitable regions than those of the Silurian formations generally. In this Province they do not change their general character, but they nevertheless, as the Agricultural Map shews, are sometimes covered with soils of medium quality.

The clay slates are for the most part formed like the Silurian strata, of beds of clay which have been gradually consolidated, but they are distinguished from the Silurian generally by two characters.

First, by their greater hardness, which prevents their crumbling down and forming the close and often deep clay soils which the Silurian rocks occasionally yield. The clay slate soils, when freed from stones, are more of the character of what are called turnip and barley, than of wheat, oat and clover soils.

Second, by their containing less lime than the Silurian rocks do. This is a character of great agricultural importance. In nearly every part of the world these Cambrian rocks are poor in lime. In climates suited to the production of peat they are also, from their impervious character, favourable to the formation of bogs. Hence in those parts of Europe where those slate rocks occupy areas of considerable breadth, draining and the use of lime are the first two measures of improvement by which the naturally unproductive agricultural qualities of these soils can be amended. The same means would probably prove profitable also on the clay slate soils of New Brunswick.

E. *The Red Sandstones.* In Westmorland, King's, Charlotte and Carleton counties, a considerable breadth is coloured of a reddish brown, designed to indicate the occurrence of these spots of red sandstone and red conglomerate more or less extensive. In regard to the exact position of these beds, whether they are all above or all below the gray coal measures, or partly the one or partly the other, a question of great economical importance to this Province has been raised. As it chiefly refers to the greater or less probability of obtaining coal, a point to which I shall refer particularly hereafter, and has comparatively little agricultural importance, I do not enter into the question here. A knowledge of the geographical position and extent of these beds is nevertheless of much importance, and it would be very desirable to have these both more exactly ascertained and more correctly delineated on the Map.

The reason of this is, that the beds of which these red rocks consist, frequently crumble down into soils of great fertility. The richest lands and the best cultivated in Scotland rest on such red rocks. It will be seen by a comparison of the Agricultural with the Geological Maps, that soils of first rate quality are known in this Province also, in Sussex vale, in Sackville, on the Shepody river, and elsewhere, to occur in the neighbourhood of rocks of a similar character.

The beds of these red sandstone formations consist—

1st. Of red conglomerates which often crumble down into hungry gravels, producing good crops of oats and of grain when well treated, but having a disposition to "eat up all the dung, and drink up all the water."

2nd. Of fine grained red sandstones, which crumble into red and sandy soils, light and easy to work, often fertile, and when well managed, capable of yielding good crops. They are such soils as the French inhabitants of this Province delight to possess, and of a large extent of such soils they are actual possessors.

3rd. Of their beds of red clay, often called red marl, interstratified with beds of red sandstone, and crumbling down into soils which vary from a fine red loam to a rich red clay. These are some of the most generally useful, and when thorough drained, most valuable soils which occur among all our geological formations. In this Province where marls are usually associated with gypsum, as may be seen by the dots of brighter red which are here and there to be seen over the reddish brown portions of the Map. The soils may generally be calculated upon as likely to prove valuable for agricultural purposes wherever these beds of gypsum occur.

Some of the sandstones of this formation, especially in the neighbourhood of beds of limestone, are themselves rich in lime. Thus a red sandstone collected in such a locality three miles from Steves', in the direction of the Butternut ridge, gave me upon annalysis 17,31 per cent. of carbonite of lime, and 0,49 per cent. of gypsum. The crumbling of such rocks as this could hardly fail in aiding to fertalize the soil.

The imperfect Geological Map of Dr. Gesner, which is lodged among the Records of the Land Office, and a more detailed copy of which is in possession of the Saint John Mechanics' Institute, represents the red rocks as much more extensive than they appear in the Map appended to this report. One reason for this is, that he colours red the Parish of Botsford, and portions of the adjoining Parishes, where the red rocks do not appear, though the soils that cover the surface are red, and have evidently been derived from Red Rocks. This we observed in our recent tour through that country. On the Grand Lake also, Dr. Gesner colours red a considerable extent of country, upon which, according to Dr. Robb, no true red rocks occur.

Still these indications of Dr. Gesner, though not geologically correct in a certain sense, are so in another sense, in which they are scarcely less useful to the Agriculturalist. They indicate the general character of the loose materials that overly the living rocks of the country and form its soils, and they tell more regarding those spots which is useful towards an estimate of its agricultural capabilities than a correct map of the rocks themselves would do. But the discordancies often observable between maps which exhibit only the characters of the rocks of a country, and those which exhibit its actual and experimental agricultural value, and the causes of such discordancies, will appear in the subsequent chapter.

F. *The Granite, Gneiss, and Mica Slate*, coloured carmine, form a broad riband extending across the Province between the two bands of Clay slate rocks. To the north of the slates also, and in the centre of the ungranted country, it forms a large patch of generally high land, the outlines and extent of which are by no means defined, and in the map are put down very much by guess.

These regions are generally stony, often rocky and impossible to clear. When less stony, they sometimes give excellent soils after the less frequent rocky masses are removed, and in many places comparatively stoneless tracts of land occur on which clearances with less cost can readily be made.

This description shews that the carmine regions are by no means agriculturally encouraging on the whole, judging by their geological character; but that they posess capabilities superior to the gray sandstone soils, is shewn by the experience of the farmers of these latter soils, that those fields generally turn out to be the best on which the the granite borders shew themselves most abundantly.—The debris of the granite mixing with that of the sandstone rocks, improves its quality, gives it often more tenacity, and renders it more productive.

The agricultural map will shew that the soils along the carmine bands, and in the centre of the wild region between the Saint John River and the Restigouche, though often very inferior, are not uniformly so. Were we better acquainted with the limits of the geological formations comprehended under this colour, we should be able by means of them alone, both to form more accurate opinions in regard to the agricultural value of the several localities, and to represent them more correctly on Geological Maps, and to prescribe by mere inspection, the kind of ameliorations, mechanical or chemical, by which their natural qualities were likely to be improved.

G. *The Trap Rocks*, coloured green, which occur so abundantly among the Southern clay and lower Silurian rocks, and in the wild country which forms the northern part of the Province, are the only remaining rocky masses which cover an extensive portion of the surface of New Brunswick. They form in this Province a wild and generally a poor, rugged, rocky, inhospitable country. Lakes, swamps, and soft wood ridges, abound where they occur, and numerous blocks of stone try the patience and industry of the settler.

Trap Rocks do not necessarily indicate the presence of unfertile soils. On the contrary, some of the most fertile spots in Scotland and England, are situate upon, and possess soils formed from these rocks. But such soils are formed only where the rocks are of a less hard and flinty nature, or at least are much more subject to the degrading influence of atmospheric causes, and crumble to a soil more readily. In such cases they generally form reddish soils of great richness, and when the soils are deep, it is found profitable to convey to some distance, and apply them as covering to less valuable fields.

One cause of this fertility of trap soils is the large percentage of lime which these trap rocks frequently contain. This chemical character, for the most part, eminently distinguishes them from the granitic rocks, and indicates a very different mode of treatment for the soils formed from these two classes of rocks respectively.

In New Brunswick, so far as my own observations goes the trap rocks do not readily crumble, but remain hard and impenetrable by the weather to a great extent. They do not usually, therefore, give rise to the rich soils which in many places are formed from them. Hence Saint John and Charlotte, partly owing to the less favourable clay slate and lower silurian rocks which abound in them, partly to the obdurate trap, and partly to the numberless rocky masses which cover their surface, are justly considered among the least agriculturally promising Counties of the Province. I have witnessed, however, in both these counties, that energy and determination can do much to overcome nature in New Brunswick, as well as in other parts of the world. Pleasing farms, and good crops, and comfortable circumstances, reward diligence and industry here in as wonderful a manner as in any other County of the Province.

I do not dwell longer on this part of my subject. The general conclusions as to the agricultural capabilities of this Province which are to be drawn from the imperfect information as to its geological structure, which our Geological Map presents, are, on the whole, somewhat discouraging.

The coal measures, the clay slates, the lower Silurian rocks, the granites, and the traps, are not, generally speaking, of a kind to give rise to soils of a very fertile character, and these formations cover a large portion of the Province. The upper Silurian and red sandstone formations, on the other hand, promise much agricultural capability, and soils prolific in corn; and they also extend over a very considerable area. Were the geological exploration more complete, our deductions from this source of information would be more precise, more to be depended on, and possibly also more favourable, for reasons which will in some measure appear from what has been already stated. It is to be hoped that Your Excellency, and the Houses of the Legislature, will see the propriety, at an early period, of resuming this important exploration.

More detailed and positive conclusions as to the absolute and comparative value of the soils in the different parts of the Province, on the different geological formations, and on the different parts of the same formation, the subdivisions of which, as I have said, have not yet been made out, will be arrived at by means of the practical survey which forms the subject of the next chapter.

CHAPTER III.

The Agricultural capabilities of the Province, as indicated by a practical Survey and examinaton of its Soils.

Although the geological structure of a country throws much general light on the geographical position, on the physical and chemical characters, and on the agricultural capabilities of the soil of a country, it does not indicate—

1st. The absolute worth or productiveness of the soils in terms of any given crop—as that the red sandstone soil would produce so many bushels of wheat—or the clay slate soil so many of oats; nor—