

of undulating plain still seemed strange and savage to an eye accustomed to the finished and picturesque appearance of an English landscape. Swamps and lakes, and rude natural forests, with intervening tracts of land under waving corn, remind the spectator how much nature yet rules, how long human industry must patiently labor still before the asperities of a new country can be rubbed off, how many generations of the enterprising men who now possess it must still toil and adorn this fine land before it will smile at their lot like that which their forefathers left."

6. *The Marcellus Shale* overlies the Helderberg limestone, and mixing with it forms very productive soils, fertile in wheat and other productions. It is narrow in the State of New York. "Farther to the west, however, it expands, and along the north shore of Lake Erie it forms a wide and valuable tract of land in the fast filling-up and fertile regions of Western Canada."

7. *The Hamilton Group* consists mainly of shales and clays, expensive and difficult to work, although in places where dry and calcareous, affording a pretty good arable and wheat soil. A large portion, however, is only fitted for pasture, and it is here the grazing and dairy country of Western New York may be said to commence.

8. *The Genesee Slate* is too thin to form an important agricultural feature of the country. It is itself poor, but where mixed with calcareous shales or marls it forms a productive soil.

9. *The Portage and Chemung Groups* consist of alternations of poor shales, flagstones and massive sandstones of enormous thickness, extending southwards into Pennsylvania, reaching to a height of 1000 feet above Lake Ontario.

"The district (observes our author) occupied by these groups of rocks presents a complete contrast to the wheat regions,—a contrast rich in evidence of the close relation between geological and agricultural capabilities. When first cleared the virgin surface produces crops of wheat, but after the first crops,—as is the case in many parts of New Brunswick, which rest upon similar rocks,—winter wheat becomes uncertain, and spring grain only can be sown. Being thus found naturally poorer, it is less cleared and cultivated than the more favored land in the plains which border the lakes. Like poor lands among ourselves also,—I may say like poor land in all countries,—it is occupied for the most part by a poorer race of cultivators, who direct their chief attention to the rearing of stock and dairy husbandry."

After speaking of the practical difficulties so often felt, in extinguishing or keeping down certain classes of weeds, from unfavorable seasons, courses of cropping, and a thousand other circumstances, which the farmer is often wholly unable to control, the Professor very justly observes:

No one will readily accuse me of a desire to undervalue the usefulness of *Chemistry* to Agriculture, and yet I have often had occasion to regret the evil influence of opinions hastily ex-

pressed by ill-informed persons,—as if this branch of knowledge alone were able to bring the most important and difficult of arts to speedy perfection. The longer a cautious and truth-seeking man lives, the wider will appear the range of knowledge, theoretical and practical,—the more numerous the circumstances to be taken into consideration before he can arrive at an accurate solution even of what some look upon as simple and superficial questions."

We must make room for the concluding paragraphs of this able and clearly written article, inasmuch as all we have ever said or written on what we believe to be the almost unparalleled natural fertility of the Canadian Peninsula, which is now fast filling up, and already teeming with a prosperous and contented population, is amply confirmed by the high authority of Professor Johnston.

"The second observation I wish to add, refers to the extension of the richest wheat-bearing formations of Western New York into the upper part of Canada West. The consequence of this extension is the reproduction in this new region of the great natural capabilities of the country I have been describing.

"Bounded on the east by Lake Ontario, on the west by Lake Huron, on the south by Lake Erie, and on the north by Manitoulin Bay, stretches a wide peninsula, occupying an area three or four times as large as the wheat region of Western New York, and covered entirely by those rocky formations on which the fertility of the latter region mainly depends. Proceeding westward from the head of Lake Ontario, we pass in succession over the surface of the Medina sandstone, Niagara limestone, the Onondaga salt group, and the Helderberg limestone and shales. On these, as the map and sections contained in this paper show, the principal wheat region in Western New York is situated. It will also be recollected that among these the Onondaga salt group is especially conspicuous for the natural fertility and friableness of its soils, and for the ease with which they can be worked and cultivated.

"Now in this peninsular portion of Canada West, the Medina sandstone and Niagara limestone expand a little after they turn round the western end of Lake Ontario, and then run towards the north in belts somewhat broader than those which they form in Western New York. But the Onondaga salt group widens to such a degree as in a line due west from Toronto to be upwards of sixty miles across, and to occupy almost the whole breadth of the peninsula between the two lakes Ontario and Huron. The natural capabilities of this new region, as a whole, may be inferred from what I have already said of the results of experience in the State of New York. So far as depends upon soil, it ought to be one of the richest agricultural regions in North America.

"Towards the southern end of the peninsula again, and along the entire northern margin of