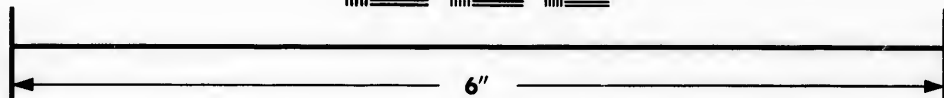
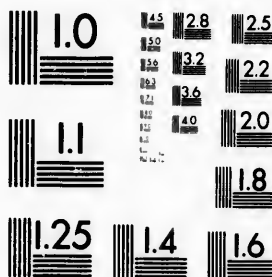


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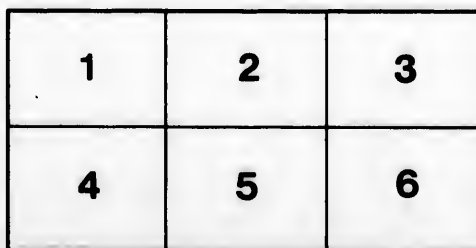
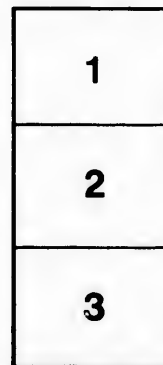
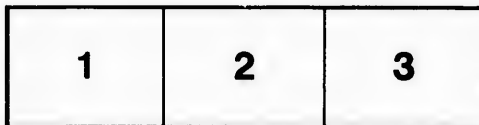
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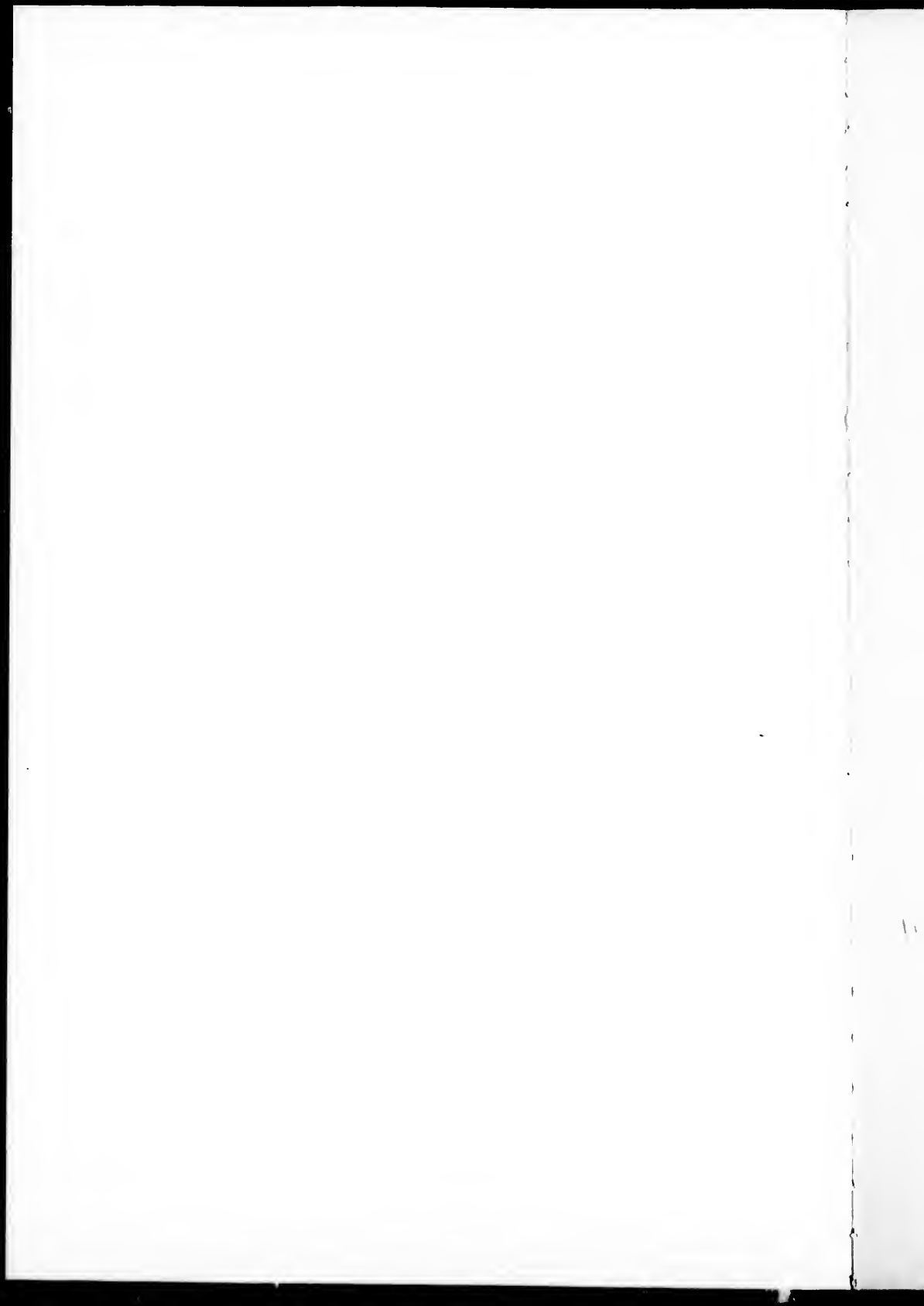
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NOTES

BY

ALFRED R. C. SELWYN, LL.D., F.R.S.

ON THE

“LIFE OF SIR W. E. LOGAN.”

BY

B. J. HARRINGTON, B.A., PH.D.

WITH AN APPENDIX ON

“THE QUEBEC GROUP.”

BY

PRINCIPAL DAWSON, C.M.G., F.R.S.

1883.

The following brief remarks on this work are submitted by the writer for the consideration of American Geologists. They are written solely in the interests of truth and impartiality, and with a desire not only to place the facts concerning the Quebec group of Logan, and other questions referred to, in their true light before all those who are interested in the matter, but also to correct the erroneous impressions on these questions, which, it seems to me, the statements in the Appendix to the work referred to, are calculated to disseminate:—

On page 216 we read: “The four groups into which he then (1844) divided the strata met with, in the main hold good to-day.” Of II., III., IV., this is correct, but can in no sense be said to be so of I., the whole relations of which have since been changed, as is in part shewn in the succeeding pages 218–219, and must now, as I have elsewhere shown, be still further modified. The Pillar Sandstones are not Middle Silurian, they are inter-stratified with Levis graptolitic shales, and they themselves hold graptolites, crinoid joints and other fossils. They are mainly below and

not above the conglomerate limestones. And they are certainly not on the same horizon as the serpentines of the Shickshock Mountains and the Eastern Townships, or as the granitoid gneisses of Sutton Mountain on the Vermont boundary, all of which are pre-Cambrian. In reviewing the Appendix I shall have occasion to refer again to this matter.

A better reason than friendship might be given (page 278) for adopting the Silurian instead of the New York nomenclature; viz.: identity of the formations and priority of the former, 1835 and 1837, respectively.

On page 345 I find: "Mr. Selwyn, Sir William's successor, when he first came to Canada, adopted the views of his predecessor, *but on further study changed his opinions*, and now believes in the Pre-Cambrian age of the rocks under consideration." This, though to a certain extent true, is a misleading statement. Instead of "*further study*" it should read "*but on studying the question himself*." The difference is apparent; it is obvious that at the time mentioned I could not have studied the subject, and could therefore have had no opinion about it, except such as might arise from faith in the conclusions of my predecessor. The whole history and circumstances of the later investigation of the Quebec Group, are fully stated in my paper communicated last May (1882) to the Geological Section of the Royal Society of Canada. The result of the investigation, as it proceeded from 1876 to 1882, was also fully and freely communicated to and discussed with the authors of *The Life of Sir W. E. Logan*, and the Appendix on the Quebec Group. I now pass to the Appendix.

The Quebec Group.—By Principal Dawson, C.M.G., F.R.S.

On page 404 we read: "Those who would detract from the work of Sir W. Logan, if there are any such." I am not aware of any one who has ever done this; but I suppose the sentence refers to me, because I have been openly accused of doing so, and the accusation has been published in a Canadian scientific journal, while my reply to the accusation was tacitly declined publication by the Editor who published the accusation. If I am right in this supposition, then I can only say that the present author, like my accuser in the journal referred to, seems to confound *supplementing and differing in opinion* with *detracting*.

On the same page, 404, we find the following sentence: "And much examination of the ground which he explored, enables me to affirm that no one will ever be able permanently to over set the general leading subdivisions of the Laurentian and Huronian which he established." And in the same connection, on page 415, we read: "In the typical Huronian area of Lake Huron it unquestionably rests

unconformably on the Laurentian." The meaning of the first of the above quotations is rather vague, and it is certainly not apparent how the author, never having worked out or mapped the stratigraphy of these ancient formations, is in a position to make any affirmation on the subject. I hesitate to do so myself, notwithstanding that I have examined much more of the ground than the author has. Examination such as that referred to by the author, is wholly insufficient to warrant such a decided expression of opinion on his part, though it may enable him to understand and adopt or reject the conclusions of others. Even Sir W. Logan never affirmed the unconformity mentioned in the second quotation; and while he designated the Laurentian a System, he called the Huronian a *series*, and he says the Laurentian gneiss is *followed* by a slate conglomerate and nowhere does he say the Huronian series *rests unconformably on* the Laurentian. Dr. Robert Bell, who has studied these formations over a far wider geographical range than perhaps any other Geologist, does not think it is so; and I have myself never been able to find satisfactory evidence of it, though I have examined the shores from Bruce Mines at intervals to Thunder Bay, and have traversed and examined the country thence to Lake Winnipeg. The mere occurrence of red gneiss and granite pebbles in the Huronian conglomerates only proves the pre-existence somewhere of such rocks; but it is no proof that these pebbles were derived from the adjacent Laurentian rocks, which we now see at the surface. I am aware that Dr. T. S. Hunt has in 1858, and since, assumed the existence of this unconformity, but so far as I can make out, on equally hasty and partial examination of the region; thus, neither Principal Dawson's nor Dr. Hunt's conclusions on this matter can be said to be based on or accord with the stratigraphical observations of either Logan, Murray, Bell, or myself.

We find, pages 405-406, a very good general statement of various geological agencies, and included in it a tacit acceptance of that very important one—contemporaneous volcanic action—never recognized or alluded to in eastern Canada geology by Sir William, nor by the author, till pointed out by me, and we find it again referred to (page 414) as a "third suggestion," and applied without acknowledgment in the same tacit manner, Supplement to Acadian Geology, 1878.

On page 407 we read: "It is difficult—impossible would be more correct—without personal examination in the field to realize the actual character of the Quebec Group rocks, as exposed on the south side of the St. Lawrence, between Point Levis and Cape Rosier;" this should be between Cape Rosier and Vermont. And herein probably lies the explanation why I can realize these characters better than those who

like the author have not examined the whole of the region as I have.

The statement, page 408, that Sir William knew that rocks even up to the Carboniferous had been "profoundly altered," may perhaps be questioned. In any case I have never seen even Devonian strata in eastern Canada, to which such a term could be correctly applied—and the succeeding sentences respecting the progressive alteration of the Quebec rocks to the south and southeast, are also wholly incorrect. The rocks are, as a fact, neither more nor less altered at Cape Rosier in Gaspé than they are at Philipsburg on the Vermont boundary, nor on the shores of the St. Lawrence, than they are on the Atlantic coast. Throughout, there are cases of local alteration, but these are clearly due to local causes, which can be pointed out; then again that the fossiliferous slates in the Eastern Townships *alternate* with the crystalline rocks named is absolutely incorrect, as it is also that any such crystalline rocks "seemingly represent the shales of Point Levis, if not still newer members of the series." The fossils alluded to occur not in nacreous slates, but in plumbaginous limestones, clearly of Trenton age, and these have no connection with the chloritic and other crystalline schists named, except as unconformably overlying and folded in outliers. Here again the author has never worked out the stratigraphy and is therefore not in a position to express an opinion. I have worked it out personally, and more or less examined the facts on the ground, from the Vermont boundary to the Gaspé peninsula, and from Maine, New Hampshire, and the Maritime Provinces, to the shores of the St. Lawrence. I am further prepared to demonstrate my conclusions either in the field or in the museum, where the whole series of specimens, carefully collected and labelled, is available for examination. These facts are well known to the author, and it is certainly remarkable under such circumstances to find a note by Sir William appended to Mr. Murray's report on Newfoundland of 1865, quoted (page 407) as "presenting as clear a view of the whole matter as we can give up to the present time," and one's astonishment is only increased after perusal of the note quoted as doing this.

On page (409) we find a repetition of the statement already alluded to, "that the Quebec group rocks become altered to the south," and another tacit admission of the contemporaneous volcanic action. The older metamorphic group, like the parallel ranging fossiliferous group, is no more altered in the township of Pottou on the Vermont boundary, than it is in the Shickshock Mountains in Gaspé, and the "*unequivocal superposition*" in Newfoundland, mentioned, same page, will, I venture to say, be found to be as equivocal as is that of the Utica slates under-

lying the Levis at Quebec; and as we now know, at many other places on the south shore of the St. Lawrence.

On the same page (409) my name first appears, and I am represented as being *disposed* to regard the altered rocks lying to the south-east of the *typical* Quebec series as belonging to two older groups. I was not *disposed* to regard, which expresses uncertainty; but after careful personal examination I have distinctly stated that they were older, not than the *typical* but than the *fossiliferous* Quebec group; the only uncertainty being whether they should be considered as one or as two groups. And, apart from supposed reversed dips, Sir William Logan's own descriptions, as I have elsewhere shown, fully and conclusively demonstrate these relations in age.

On page 410 my results are "shortly" examined, and first in this examination is a remarkable statement of an "inability" on my part; no reasons are given for the inability alluded to; this inability, however, did not only extend as stated "eastward and westward of Quebec," but over the whole extent of the Quebec group. The examination of my results is, however, undoubtedly as stated, short; as the whole of the remaining paragraphs on this and on the following page (411) are devoted not to my results, but to those of Sir William, Dr. Hunt, Mr. Billings and Mr. Richardson, except an admission that the author agrees with me in the very important fact,—indeed all important in relation to the discussion,—namely, that what has been attempted to be done, and is in fact described in the reports, and depicted on the maps, can not be done. Virtually an admission that Lauzon and Sillery have no definite or definable existence apart from Levis, and therefore that I am right, and Sir William and Mr. Richardson are wrong.

On the same page (411) the author says: "Nor is it at all unlikely they *may have* been confounded with the Lauzon and Sillery;" no indication is however given here that this also is one of my results, and that the localities where it has occurred have been pointed out by me. I must also take exception to the statement (pages 410 and 411) as well as to the inferences attempted to be drawn from them, respecting the sandstones and shales, etc., near Metis and Matanne, and to the observations, having a similar import, respecting the series at Point Levis. In these statements the author has omitted two very important facts, namely: that a large and very characteristic graptolitic fauna showing undoubted Levis types is associated with the beds holding the obscure forms named, as Stropolithon, Scolithus, etc., and that the trilobites of primitive type are, as at Point Levis, in the pebbles or *slabs* of the conglomerates. Further I may say that the

limestone conglomerates, at Point Levis and on the Island of Orleans, both underlie and overlie the shales holding graptolites, while at several places along the coast, apparently dipping under the Levis rocks, are others holding a distinct Utica fauna, the relations being exactly like those which originally misled Sir W. Logan at Quebec and on the Island of Orleans. All these facts were distinctly pointed out to the author by myself after my examinations of the region in 1876, 1877, and 1878.

Of evidence from Newfoundland (pages 409 and 411) I shall say nothing. I have never been there, and am therefore in no position to express any opinion or make any affirmations of belief respecting it; but Mr. Billings' remarks (pages 64-67; *Paleozoic Fossils*, Vol. I.) indicate plainly to me that the stratigraphy on which his paleontological conclusions were based was wrong, and we need not therefore be surprised at his concluding sentence as follows: "Judging from the fossils alone I should say that the Levis immediately succeeds the Calciferous, but the physical evidence seems to show that this is not the case."

On page 412 we find a repetition of the statement of my views made on page 209 which, except as regards the use of the wholly inapplicable term *disposed to*, is correct. I have distinctly demonstrated and affirmed the fact, both from my own independent observation and from a careful study of Sir William's descriptions of his observations in 1842, 1844, 1848.

On the same pages microscopic fossils are mentioned in connection with the older series. This error I have explained ante in remarks on page 408. Also a supposition is advanced that there "may be two crystalline series, one below and one above the Levis." Well, we may suppose anything however unlikely and improbable, and this supposition, for which there is not one particle of evidence, can only be placed in that class. To suggest it seems to imply an entire want of practical knowledge or appreciation of the structural geology of the region.

To the summing up, on page 414, I must necessarily assent, as, though it contains a repetition of certain errors already pointed out, it is in the main a correct statement, and a tacit acceptance of my own conclusions respecting the Quebec Group; but it can scarcely be said to embody the views of my predecessor, which were, I believe, till quite recently, likewise those of the author.

As regards the use of the name Levis leading to misconception, while admitting this to some extent, I can only say that having shown

the non-existence of Sillery and Lauzon apart from Levis, and having eliminated from the Quebec Group the metamorphic older series, and also considerable areas of Trenton, Utica and Hudson Rivers hitherto included in it, the course deprecated seems less open to objection than to retain the name Quebec group. However, names are, as is justly remarked, of very little importance in themselves, and I cordially agree in the necessity of not "misapplying them or needlessly changing them," especially in the direction of inventing new ones.

I can not agree in the statement (page 218) of the "main point in dispute between Sir W. Logan and his later critics," indeed not only is it not the main point in dispute, but it has absolutely nothing whatever to do with it.

The main points—there are more than one—at issue between my predecessor and myself simply and fairly stated, are: 1st. Is the Quebec group as defined by Logan entirely palaeozoic or not. 2nd. Are the crystalline Levis, Lauzon and Sillery the same formations as the fossiliferous Levis, Lauzon and Sillery as they are shewn to be on the maps and in the reports. 3rd. Does the Quebec Group represent Calciferous and Chazy only as is clearly indicated on the maps and stated in the reports,* or does it include as I have pointed out it does since 1876, large areas of pre-Cambrian rocks and portions of all the formations of the New York system, perhaps from Potsdam, and even Primordial, up to Utica and Hudson River.

If I am right then Sir William was wrong, and if so it is useless to vindicate his accuracy, when further and more detailed investigation and the most distinct evidence shows he was mistaken. If I am wrong no one will be better pleased than I shall be to have my error demonstrated and to acknowledge it; but I must be excused if I am not willing to accept as evidence every kind of theory, possibility, probability and supposition of what might be, mixed with much excellent advice to students, on geological observation and induction, but scarcely required in the present discussion, unless as serving to obscure the real issues in the case under consideration.

In conclusion I would say that I much regret having been obliged to make the foregoing remarks, because some will think them—and perhaps represent them—as an attack on my predecessor, which they are not. The work of my predecessor requires no defender, but like other mortals he was not infallible. No one can appreciate more fully than I can the great value of his work. I have myself been actively

* Page 20, Geol. of Canada, 1863.

and continuously engaged in similar work for thirty-eight years, under similar difficulties and hardships to those which he encountered, and in which, therefore, my experience when I commenced to study the Quebec group was far greater than was Sir William Logan's when his final conclusions were reached in 1863. Therefore when I find my conclusions covertly attacked in vindicating those of my predecessor, and at the same time often tacitly adopted, in some cases with no acknowledgment and in others with the barest possible allusion to their author, while the whole subject is entirely misstated, as I have shown it to have been, it will I think be admitted by all unprejudiced persons that the foregoing remarks are not under the circumstances uncalled for or out of place.

OTTAWA, April, 1883.

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