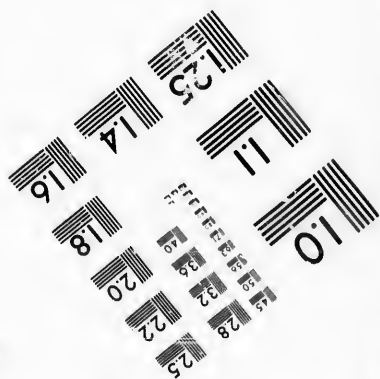
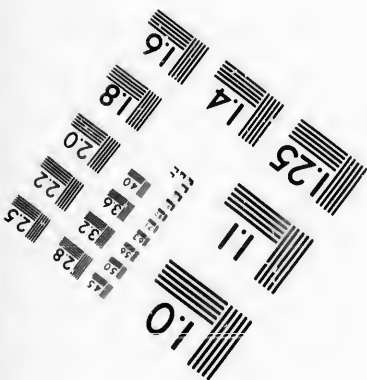
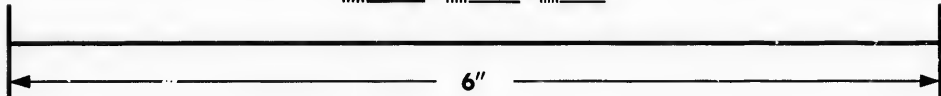
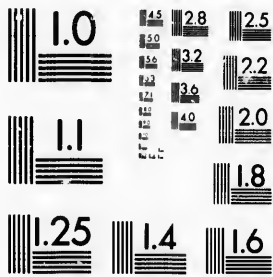


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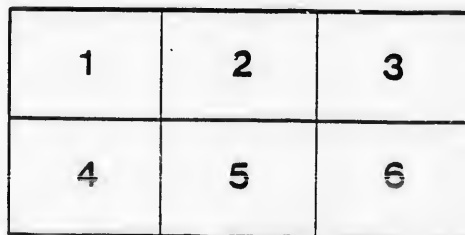
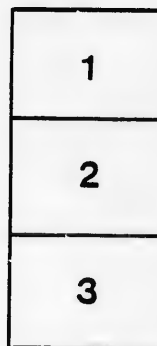
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Division of Palaeontology

H. M. Ami, C.O.L.

Separates

[From the PROCEEDINGS OF THE BOSTON SOCIETY OF NATURAL HISTORY
Vol. XXIII, Mar. 2, 1887.]

ON THE USE OF THE NAME TACONIC.

BY JULES MARCOU.

^{page}
If priority is to be adhered to strictly and above all other considerations, it is in natural history; for, without it, zoology, botany, palaeontology, mineralogy and lithology, would become a confused and almost valueless mass of documents. All *savants* without regard to nationality, schools, or personal inclination, now place priority first; and a naturalist who disregards it is sure one day or another, to be severely judged. Justice requires it, classifications require it, museums require it, libraries require it, bibliographies require it; and, finally, progress of science, will be impossible without it.

Questions of priority are matters of printed facts, and the greater caution and exactness are required to establish them on a solid basis. Often, I will say too often, an author unintentionally and with great honesty of purpose, thinking the matter of little consequence, quotes loosely and out of date, inexact synonymy, or gives precedence to publications and names, which are in fact posterior and consequently placed in wrong positions.

The memoir of Mr. Walcott, "Second Contribution to the Studies on the Cambrian Faunas of North America" (Bulletin U. S. Geol. Surv., No. 30, Washington, 1886), is too important, and he is too desirous "to establish," as he says, "on a firm stratigraphic and palaeontologic basis, the Cambrian system of the continent," not

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to help him by pointing out errors in "these preliminary studies," as he calls them, adding candidly that he "will be glad to have his attention called to them."¹

It is in answer to his demand that I will call his attention, first, to "the use of the name Taconic;" and later, in another paper which will promptly follow, on "the Taconic of Georgia, Vermont." Mr. Walcott has a long explanation entitled: "On the use of the name Taconic," in his "introductory observations" (see pp. 65 to 71), where he tries to show why he is "compelled to use Cambrian in preference to Taconic."

Mr. Walcott says that the fauna published in "his paper is the fauna of the Upper Taconic of Emmons as defined by him in 1855;" moreover, he admits that "Dr. Emmons was correct in classifying the Upper Taconic as Pre-Potsdam;" and further he says that "Dr. Emmons deserves great credit for the work that he did." Yet notwithstanding all these friendly admissions of the discovery and value of the Taconic system, and the singular statement that the lower division "will be dropped entirely;" and that "the Upper Taconic which," according to Mr. Walcott, "is not now known to occur in the Taconic area, would be taken as the true Taconic, which it does not appear to be, although Dr. Emmons included the *Black Slates* in it in 1847;" farther on he adds, "it is one of the misfortunes of his (Dr. Emmons) career that he began his work on the Taconic system in the Taconic area, instead of Western Vermont or along the Hudson river, etc." Emmons, on the contrary, ought to be highly complimented, because he first worked out, in a difficult part of the country, the arduous and most important problem of finding an immense system of strata below the Potsdam, collecting stratigraphic and palaeontologic proofs at and near the Taconic range. The name is excellent in all respects, being indigenous, a beautiful Indian denomination, indicating a range of mountains well defined, where the first observations were made, and is as appropriate as the Jurassic, from the Jura mountains.

As to the Taconic area not being truly Taconic, and "that most, if not all, of the strata included by Emmons in his original Taconic are of Lower Silurian age," Mr. Walcott, by his own researches

¹ Second Contribution to the Studies, etc., on pp. 58, 59 and 65.

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of 1886, knows now that these are only erroneous notions put forward by the "united opposition of Emmons' contemporaries."

The use of the name Taconic is a very simple question. It rests entirely on priority. Barrande has demonstrated, as far back as 1861, that it was in the Taconic system, that the primordial fauna was first discovered in 1844, and, consequently, that the American name has precedence over all other names.

It is a creed among geologists, a creed which has just received a new sanction and acknowledgment at the meeting of the Commission for the uniformity of nomenclature of the International Geological Congress at Geneva, in August last, that no system of stratified rocks is accepted as independent and separate, unless it contain a special fauna. Sedgwick did not find a single fossil in the lower part, of what he called, in 1835, the Cambrian system, and he had no right to include it in the Cambrian. We have there two systems of strata as well marked and separated as any of the different systems in existence in our classifications.

The Taconic system is the only *Terrain* or division of the second order that can be claimed by American geologists in the general classification of the strata of the world; and to surrender it into the hands of the English is to give up the only claim we have to be recognized as original discoverers. Certainly, we shall preserve also all the classifications of the divisions of the third (divisions), fourth (groups) and fifth (beds), orders special to America; and on that account there is not the smallest danger to be apprehended of their being suppressed or superseded by European geologists. But it is a patriotic duty for us Americans to preserve and keep religiously, the fact that here, among the mountain ranges which separate the Hudson river and Lake Champlain from the Connecticut river and the Green mountains, the great system, containing the Primordial fauna, was first discovered, pointed out and named.

Mr. Walcott uses repeatedly the name Ordovician as a synonym or substitute for Lower Silurian (second fauna) confining the name Cambrian to the Taconic or Primordial fauna horizon. It is an unfortunate introduction of a very recent name, for strata well defined and named in America many years previously. Doctor Emmons in his remarkable classification of the Palaeozoic strata of the State of New York in 1842 and 1846,¹ called "Champlain

¹ Geology of New York, Part II, p. 112, and Agriculture of New York, Vol. I, p. 115. Albany, 1842-46.

division," almost all the strata containing the second fauna; very little alteration and correction are wanted to place it in harmony with the other great palaeontologic and stratigraphic systems. He says, that like the divisions adopted in the Reports of the Geological Survey of New York, he proposes to subdivide the New York system of rocks, by employing geographical names which he had found useful geologically,—certainly an excellent principle used everywhere.

The name Champlain was used by de Verneuil in his celebrated *Note sur le parallélisme des roches des dépôts paléozoïques de l'Amérique septentrionale avec ceux de l'Europe*, etc. (Bulletin Soc. Géol. de France, tome iv, p. 646, 19 April, 1847, Paris), as a synonym for the Lower Silurian, and ever since, in numerous publications made in the United States, in Canada and in Europe, the name, first given by Dr. Emmons, has often been employed and ~~his~~ meaning is well understood.

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In 1879, Professor C. Lapworth, impressed with the fine palaeontological classification of the Lower Palaeozoic rocks, by Barrois, into Primordial, Second and Third fauna, and desirous of effecting a sort of compromise between Sedgwick's, and Murchison's, classifications, proposed the name Ordovician, from Ordovicæ the northern portion of Wales, for the rocks containing the second fauna, instead of Upper Cambrian of Sedgwick, Lower Silurian of Murchison and Cambro-Silurian of Jukes. (On the Tripartite Classification of the Lower Palaeozoic Rocks, in Geol. Mag. January, 1879, Dec. n, Vol. vi, London.)

In making such a proposition Professor Lapworth ignores all previous classifications made out of Great Britain. He not only puts aside all questions of priority, but does not comply with the law that a system cannot be accepted if it was not, at the time of its discovery, characterized by a special fauna. In fact the proposition is made against all laws of priority, of palaeontological evidence, and without any regard to the numerous works and important discoveries made in America. That any American geologist should accept such a proposition, and let his right not only be infringed, but even overlooked, is so surprising, that it will suffice to point it out.

Our strata have not been studied and classified by Englishmen, nor even by Canadians. All our researches stand by themselves without the aid of Murchison, Sedgwick and other British writers. Our geology is as great as our country; and European geologists

are ready to recognize the part taken by American geologists. At the meeting of the International Geological Congress at Berlin, the Secretary of the Commission on the uniformity of nomenclature, Prof. G. Dewalque, made a report in which he says: "M. Jules Marcon, in an important work published by the American Academy of Science and Arts, and entitled 'The Taconic System and its Position in Stratigraphic Geology,' has vindicated the priority of the term *Taconic* of which the *Cambrian* above mentioned (or Primordial fauna) would be the equivalent. To us the question seems to be demonstrated. In such a case the term Cambrian should be employed to replace the Ordovician, the name Silurian should come back by right to group 6. If we be not in error, this solution would avoid many difficulties. We propose, then, to the Congress to determine first, the names that the groups 4, 5 and 6 should bear. It will afterwards have to decide whether they constitute one or two systems; and, finally, the name or names to be employed."

"Dr. A. Geikie proposed that the Congress postpone the subject of subdividing the Cambrian and Silurian until the meeting in England; on the ground that the Silurian question was mainly an English question. (Loud murmurs.) Professor Hughes agreed with Dr. Geikie as to the propriety of postponing the discussion of these questions, and said that Professor Hall had also expressed his approval of this course."

"The chairman, Dr. von Dechen, put the question to divide the Silurian, but leave the names till the meeting in England. Professor Capellini regretted such action, if it would postpone the completion of the European map. M. Hanchecorne said it would not, as the map would be completed without waiting for the determination of the names."

"The motion was then put and carried." (See "The work of the International Congress of Geologists and its committees," published under the direction of Persifer Frazer, page 24 and also pages 57 and 58, 1886, no place of publication.)

From this quotation it seems that two English geologists, Mr. A. Geikie representing the Murchisonians and Mr. T. McKenny Hughes representing the Sedgwickians, backed by an American geologist, Mr. James Hall, representing "the united opposition of Dr. Emmons' contemporaries," succeeded in preventing the Berlin's International Geological Congress from voting and rendering justice

to our just claim of having first recognized the Primordial fauna and first named the Taconic system. The vote in favor of the Taconic would have been carried by a large majority, according to the proposition made by Prof. G. Dewalque as Secretary of the Commission for the uniformity of the nomenclature. To say that the Silurian is mainly an English question is an assertion, which the "loud murmurs" of the members present at the meeting have sufficiently disposed of as unjust. The question is cosmopolite and international, and all the geologists of the world have a right to investigate and express their views.

In this connection I shall call attention to "A geological map of the United States" by C. H. Hitchcock, published lately in the Transactions of the American Institute of Mining Engineers,¹ November, 1886, Vol. xv, p. 486, purporting "to illustrate the schemes of coloration and nomenclature recommended by the International Geological Congress." In that map Professor Hitchcock has anticipated the decisions of the Congress, in using the name Cambrian and placing under one system instead of two, the second fauna and the third fauna which is called Silurian. The Congress has postponed the subject of naming the Lower Palaeozoic rocks

¹ In a foot note, p. 479 and p. 15 of the separate pamphlet accompanying his geological map of the American Institute of Mining Engineers, Mr. Hitchcock says, "Bulletin No. 7, published by the U. S. Geological Survey, is entitled *Mapoteca Geologica Americana*, a catalogue of geological maps of America (north and south) 1752-1881, in geographic and chronologic order; by Jules Marcou and John Belknap Marcou, 1881. It professes to enumerate every geological map ever published relating to American geology, together with a brief statement of the circumstances attending its publication and various comments. Some of our statements given on previous pages are in direct variance with those of the *Mapoteca*, and more in accordance with the views of American geologists. Since this *chef d'œuvre* of Logan and Hall is not mentioned in the Bulletin, even by title, the publication must be compared to that celebrated performance of Hamlet where, owing to infelicitous circumstances, the part of Hamlet was omitted."

The title of this *chef d'œuvre* of Logan is on p. 29, No. 59, of the *Mapoteca*, represented by the reduced maps or "index" as Logan calls it, on the scale of 125 miles to one inch, of the larger maps in eight sheets. That index, or *tableau d'assemblage* of the eight sheets maps, is absolutely identical with the large map: the same title, the same nomenclature, the same explanation of the colors, the same coloring, the same letters and Arabic numerals, the same geographical distribution of the group of rocks. The slip of paper on which the large map was written, was left in the drawer, containing the manuscript, and it was not found until too late for its insertion in the *Mapoteca*. A material oversight which happily does not affect the completeness of the *Mapoteca*. As to the "statements" of Mr. Hitchcock "in direct variance with those of *Mapoteca*" they will be treated with details, giving all the dates and exact issue of the maps, volumes and pamphlets in my next paper on the "Taconic of Georgia and the Report on the Geology of Vermont."

until the meeting in England in 1888. It has only accepted the groups numbered 4 (primordial fauna), 5 (second fauna), and 6 (third fauna); showing that the Congress was determined to have three systems, and not two as given by Mr. Hitchcock; and that the Geological map of Europe, for which the classification is made, is going on, according to M. Hauchecorne, without waiting for the determination of the names, but using only the numbers 4, 5 and 6.

It is to be regretted that an American geologist, against the decision of the Berlin Congress, has taken upon himself to anticipate and foreshadow what the Congress may accept as a solution; and more than that, has put aside all American claims of priority to name the great zone of the Primordial fauna. If Professor Hitchcock had said on his map and in the explanatory text that the colors and names were only provisional (*provisoire*) as it is marked at the head of the "color-scale for the geological general map of Europe" (see at the end of Dr. Frazer's pamphlet on the International Congress at Berlin), it would have been more in accordance with the results arrived at by the Committee upon uniformity of nomenclature.

The following table expresses in a condensed way, easy to read, all the principal views entertained in regard to the classification of the Lower Palaeozoic rocks in Europe and Asia. All data refer to memoirs and works well known and interested in the question. A list of them is subjoined.

At the beginning, geologic methods were used by the first observers, like Sedgwick, Murchison, Emu, and others, who had to make their way, with more or less of accuracy, in problems entirely new; and in using tools which had been tried, until then, only on the more recent formations. That some mistakes were made is certain, and it is a wonder that they are no more numerous; human passion, personal rivalry and jealousy, also added to the already very complicated question. But now, we can be more just and give credit where it is deserved. Priority of discoveries must stand first, and pass before anything else; and it is for us to correct the mistakes and injustice of our predecessors and contemporaries. If we do not do it now, it will remain for our successors to give due credit to all the great discoverers and classifiers of the history of our planet. It is simply a question of time.

The facts are now well exposed before the geologists of the

world. The Transition rocks are divided into systems, as well separated, and as well characterized as the Secondary or Tertiary rocks. The existence of well defined systems among the strata containing the beginning of life on our planet is no more to be doubted or discussed; and the Palaeozoic series or era is now divided palaeontologically and stratigraphically into systems well defined and equal in value to any system existing in our nomenclature of the earth's history.

Sedgwick's Cambrian comprises two systems, whose individuality is now recognized and admitted by all observers. In one exists the Primordial fauna and in the other the Second fauna. Sedgwick did not find the Primordial fauna and ignored it altogether until the end of his researches in the field; on the contrary, he discovered and signalized the Second fauna and had it described by McCoy. These facts cannot be disregarded. They solve the question and put aside all the claims of right to name these two systems. To Sedgwick belongs the Second fauna and the rocks containing it; and there the name of Cambrian must be confined. The other system, containing the Primordial fauna, was first signalized and described in America, independently of Sedgwick and of other researches made in Europe. Barrande first recognized the great value of the Primordial fauna; characterized the forms of animals found in it, and its features, which have ever since been accepted and acknowledged everywhere. No better judge, consequently, than Barrande exists; and his opinion as to the priority and the importance of the discovery of the Taconic system containing the Primordial fauna must be accepted as a law, as solid as any law or rules made in geology. To Emmons belongs the other system of the primitive Cambrian of Sedgwick, and its name of Taconic must supersede Cambrian with its double meaning.

I will add that Emmons saw, in 1842, that the lower division of the Cambrian of Sedgwick was, rather more than a division of the third order, a system or great grouping of strata of the second order. He knew no fossils then, and had the merit of being, even stratigraphically, the first discoverer; finding and proving that the strata below the upper Cambrian form a true system, which is called the Taconic system. (See: *Geology of New York*, Part II, p. 163, Albany, 1842.)

So stratigraphically and palaeontologically Emmons has priority

in calling all the lower rocks of the palaeozoic and base of the great series of strata, the *Taconic System*, referring them to a *system* and not to a subdivision of a system as Sedgwick wrongly did.

Murchison in claiming the rocks of the Second fauna—and even the greatest part of the Primordial fauna—as belonging to the Silurian, has committed precisely the same scientific error as Sedgwick, putting two systems into one. Palaeontology has put an end to the discussion and to the tendency of both Sedgwick and Murchison to monopolize two systems. It has found a solution creditable to the two adversaries, and at the same time to a third observer, Emmons, who without claiming anything, has found the Primordial fauna, the very base and first step of Palaeontology itself.

Ordovician is absolutely valueless and creates a confusion without any compensation. Its author has put it forward on the trivial objection that the two opponents—Sedgwick and Murchison—being both wrong, a new name was desirable; and Professor Lapworth chooses a Welsh name, without consideration of the claims either of foreign geologists or foreign geology. Priority was set aside, and without any regard to the name of Champlain group used in America since 1844—a fact which he seems to ignore—he has not hesitated in offering as a solution of the difficulty, a new name whose only merit is in being British. American geologists know well what is meant by Champlain group or Trenton fauna, and to replace it now by Ordovician, when we try to give credit and approve the claims of the distinguished authors and pioneers of the discoveries made in the Lower Palaeozoic rocks of the world, cannot be allowed. There is confusion enough without it. Let us be content with the names offered in 1835 and 1844 by Sedgwick, Murchison and Emmons.

In fact, to Sedgwick we owe the *Combrion*, limited to one fauna, proved by Barrande to be the *Second fauna*; to Murchison we owe the *Silurian*, limited to the *Third fauna*; and to Emmons we owe the *Taconic* comprising the *Primordial fauna*.

American geologists have the right of priority in the Taconic system, and also they have priority in the name of Champlain over Ordovician offered lately by the English.

TABLE SHOWING THE TRUE HISTORIC CLASSIFICATION AND ORDER OF DISCOVERIES OF THE LOWER PALÆOZOIC ROCKS.

	SEDGWICK. 1835-31-32-55.	MURCHISON. 1837-39-51-52-57.	EMMONS. 1837-42-44-53-60.	BARRANDE. 1846-51-52-57-58-59-60-61-80.	MARCOF. 1860-61-62-84-85.	LAPWORTH. 1875.	WALCOTT. 1886.
THIRD FAUNA.	Silurian system of Wenlock and Ludlow groups.	Upper Silurian.		Silurien supérieur Faune troisième.	Silurian.	Silurian.	Silurian.
SECOND FAUNA.	Upper Cambrian System or Ball's group; fossils found and designated in 1833.	Lower Silurian; fossils identical with those found by Sedgwick in the Upper Cambrian.	Champlain group, with the Potsdam as the base. Fossils, 1837-42.	D. Etage des quartzites du Silurien inférieur. Faune seconde. Colonies.	Cambrian.	Ordovician.	Ordovician or Lower Silurian. Second fauna of Barrande or the Trenton fauna.
FIRST OR PRIMORDIAL FAUNA.	Middle Cambrian or Fechnig group, or <i>Trilobites</i> and <i>Trilobites</i> described in 1831-32. Lower Cambrian or Longmynd and Bangor Groups. No fossils.	Primordial or Lower Silurian rocks. In 1844, Murchison found and described as Cambrian rocks, only the Longmynd and claims the Primordial zone as Lower Silurian.	Taconic System. No fossils yet in 1842. In 1844, fossils are found and described as a special fauna; form <i>Atops</i> (<i>Conocleptis</i>) and <i>Diplocephalus</i> explained, 1841 Bar. In 1858, three fauna of fossils is announced the number of fossils increased; and in 1860 Emmons regards the Upper Primordial zone as the Taconic as the has been established zones; and the Primordial zone of Bohemia.	C. Etage des protozoïtes du Silurien inférieur. Faune première. Colonies. In 1858, three fauna of fossils is announced the number of fossils increased; and in 1860 Emmons regards the Upper Primordial zone as the Taconic as the has been established zones; and the Primordial zone of Bohemia.	Taconic System. In 1860, Marcou puts the Potsdam in the upper part of the Taconic. In 1884, three fauna of fossils is announced the number of fossils increased; and in 1860 Emmons regards the Upper Primordial zone as the Taconic as the has been established zones; and the Primordial zone of Bohemia.	Cambrian.	Cambrian divided into Upper Cambrian = Potsdam or <i>Dalmanella</i> ; Middle Cambrian = Georgia or <i>Obolites</i> ; Lower Cambrian = St. John series, Newfoundland and Braintree, Mass., or <i>Paradoxides</i> <i>fa. 3.</i>

LIST OF BOOKS AND PAPERS CONTAINING THE HISTORIC CLASSIFICATION AND THE ORDER OF DISCOVERIES.

BARRANDE (JOACHIM).

1846. Notice préliminaire sur le Système Silurien et les Tribolites de Bohême. 8vo, Leipzig. Primordial fauna.
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