

The testimony of the rocks, or geology in its bearings on the two theologies, natural and revealed / by Hugh Miller.

Contributors

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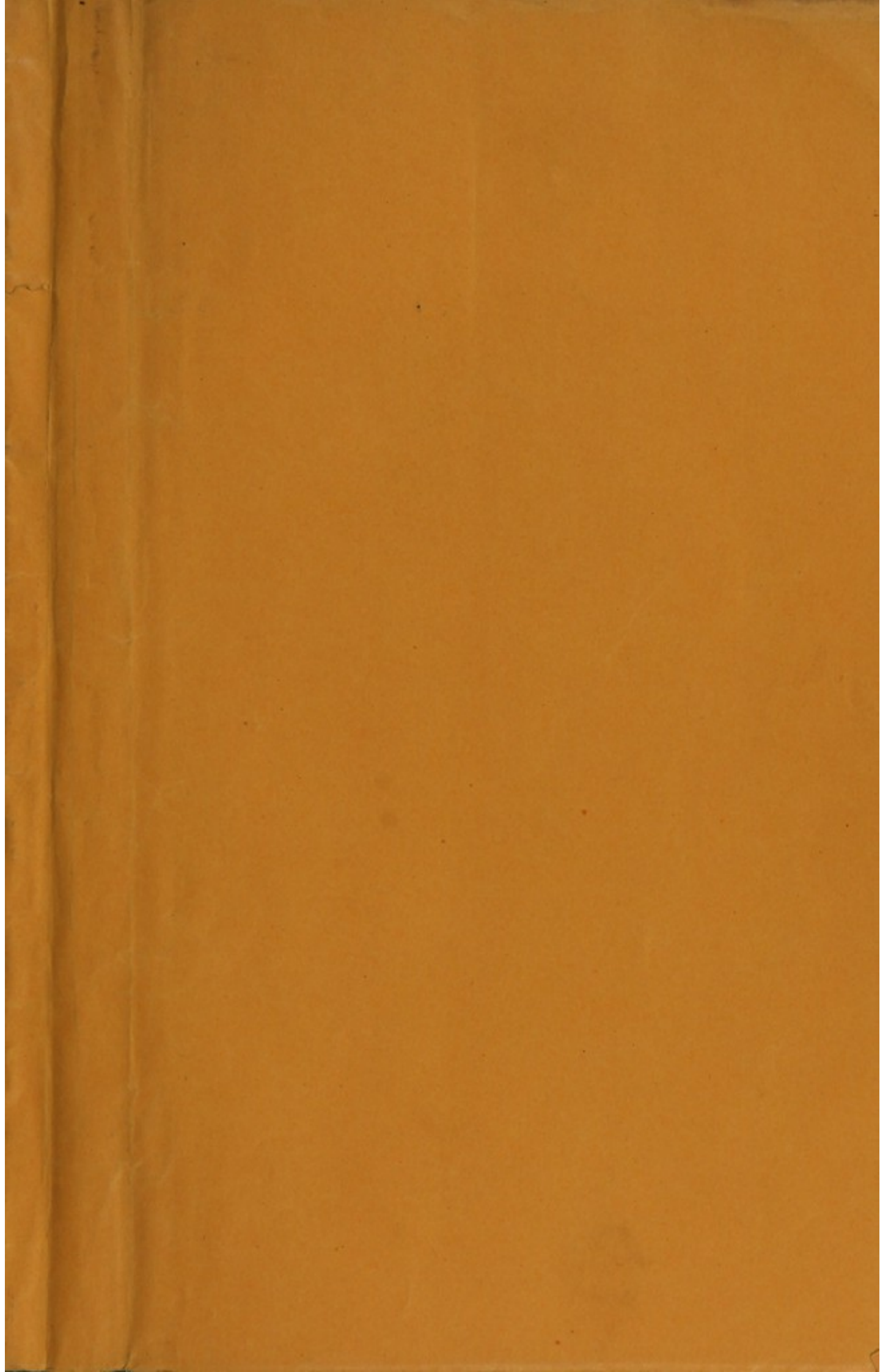
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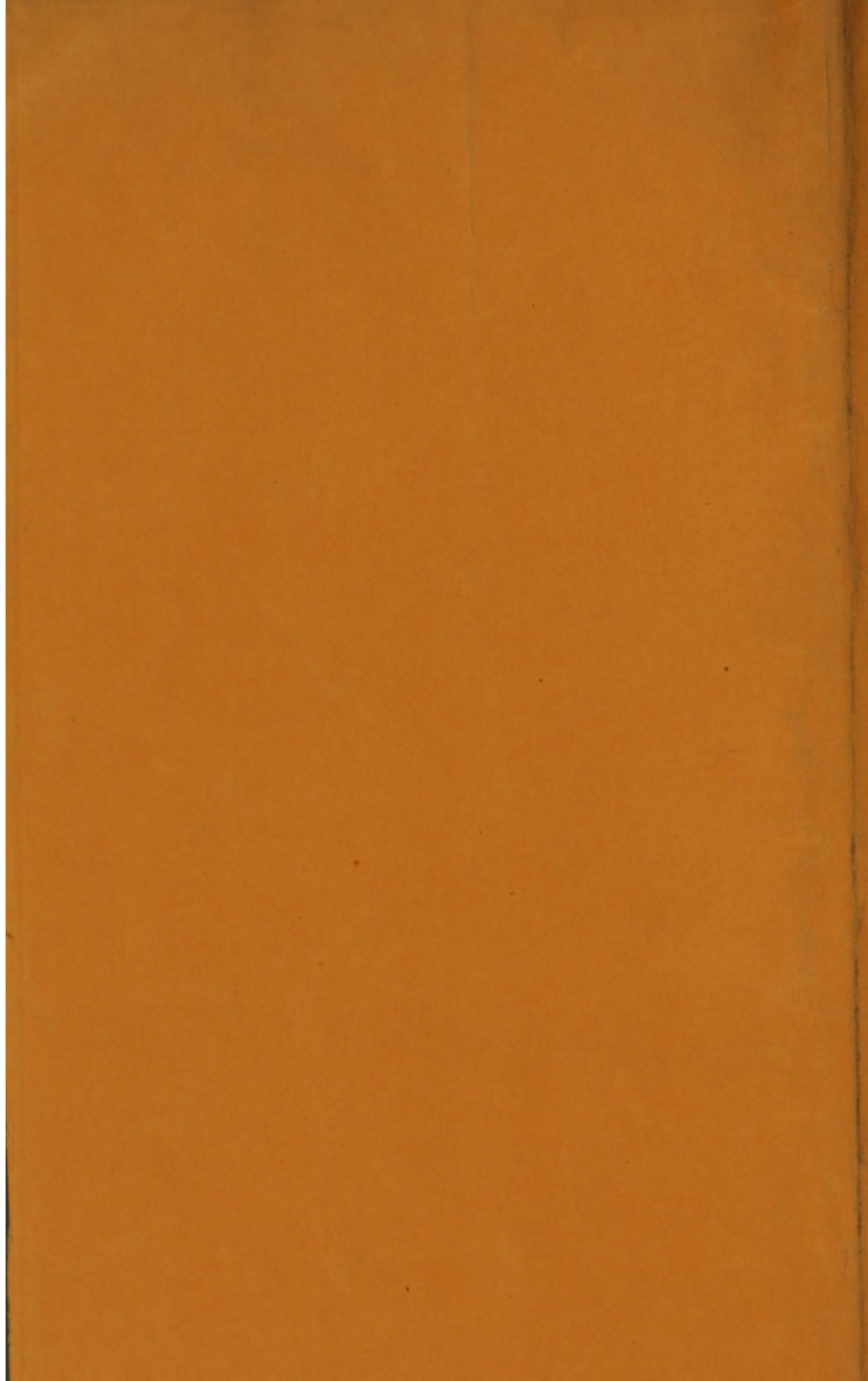
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THE TESTIMONY OF THE ROCKS, OR GEOLOGY IN ITS BEARINGS ON
THE TWO THEOLOGIES, NATURAL AND REVEALED. BY HUGH MILLER,
Author of "The Old Red Sandstone," "Footprints of the Creator," &c. &c.
Boston: Gould & Lincoln. 1857.

[Pages 159, 160, 161.]

LECTURE III.—THE TWO RECORDS, MOSAIC AND GEOLOGICAL.

First printed in the U. S. in 1854.

The geologist, in his attempts to collate the Divine with the geologic record, has, I repeat, only three of the six periods of creation to account for,—the period of plants, the period of great sea monsters and creeping things, and the period of cattle and beasts of the earth. He is called on to question his systems and formations regarding the remains of these three great periods, and of these only. And the question once fairly stated, what, I ask, is the reply? All geologists agree in holding that the vast geological scale naturally divides into *three* great parts. There are many lesser divisions,—divisions into systems, formations, deposits, beds, strata; but the master divisions, in each of which we find a type of life so unlike that of the others, that even the unpractised eye can detect the difference, are simply three,—the Palæozoic, or oldest fossiliferous division; the Secondary, or middle fossiliferous division; and the Tertiary, or latest fossiliferous division.

In the first, or Palæozoic division, we find corals, crustaceans molluscs, fishes, and, in its later formations, a few reptiles. But none of these classes of organisms give its leading character to the Palæozoic; they do not constitute its prominent feature, or

render it more remarkable as a scene of life than any of the divisions which followed. That which chiefly distinguished the Palæozoic from the Secondary and Tertiary periods was its gorgeous flora.* It was emphatically the period of plants,—“of herbs yielding seed after their kind.” In no other age did the world ever witness such a flora: the youth of the earth was peculiarly a green and umbrageous youth,—a youth of dusk and tangled forests, of huge pines and stately araucarians, of the reed-like calamite, the tall tree-fern, the sculptured sigillaria, and the hirsute lepidodendron. Wherever dry land, or shallow lake, or running stream appeared, from where Melville Island now spreads out its ice wastes under the star of the pole, to where the arid plains of Australia lie solitary beneath the bright cross of the south, a rank and luxuriant herbage cumbered every footbreadth of the dank and steaming soil; and even to distant planets our earth must have shone through the enveloping cloud with a green and delicate ray. Of this extraordinary age of plants we have our cheerful remembrancers and witnesses in the flames that roar in our chimneys when we pile up the winter fire,—in the brilliant gas that now casts its light on this great assemblage, and that lightens up the streets and lanes of this vast city,—in the glowing furnaces that smelt our metals, and give moving power to our ponderous engines,—in the long dusky trains that, with shriek and snort, speed dart-like athwart our landscapes,—and in the great cloud-enveloped vessels that darken the lower reaches of your noble river, and rush in foam over ocean and sea. The geologic evidence is so complete as to be patent to all, that the first great period of organized being was, as described in the Mosaic record, peculiarly a period of herbs and trees, “yielding seed after their kind.”

[* The elementary books upon geology show that the limits of the palæozoic system, or “division,” (*i. e.*, of the most ancient series of geological periods of which there remain evidences of organic life,) have been chiefly determined by peculiarities of *animal* forms; and that vegetable types have only a secondary place in this respect. This and the following notes are by the editor.—W. P. F.

[Pages 171, 172, 173, 174, 175.]

Let me yet further remark, that in each of these three great periods we find, with respect to the classes of existences, vegetable or animal, by which they are most prominently characterized, certain well marked culminating points together, if I may so express myself,—twilight periods of morning dawn and evening decline. The plants of the earlier and terminal systems of the Palæozoic division are few and small: it was only during the protracted *cons* of the Carboniferous period that they received their amazing development, unequalled in any previous or succeeding time. In like manner, in the earlier or Triassic deposits of the Secondary division, the reptilian remains are comparatively inconsiderable; and they are almost equally so in its Cretaceous or later deposits. It was during those middle ages of the division, represented by its Liassic, Oolitic, and Wealden formations, that the class existed in that abundance which rendered it so peculiarly, above every other age, an age of creeping things and great sea monsters. And so also, in the Tertiary, regarded as but an early portion of the human division, there was a period of increase and diminution,—a morning and evening of mammalian life. The mammals of its early Eocene age were comparatively small in bulk and low in standing; in its concluding ages, too, immediately ere the appearance of man, or just as he had appeared, they exhibited, both in size and number, a reduced and less imposing aspect. It was chiefly in its middle and latter, or Miocene, Pliocene, and Pleistocene ages, that the myriads of its huger giants,—its *dinotheria*, mastodons, and mammoths,—cumbered the soil. I, of course, restrict my remarks to the three periods of organic life, and have not inquired whether aught analogous to these mornings and evenings of increase and diminution need be sought after in any of the others.

PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF
PHILADELPHIA, VOL. VII. NO. III.

May 9th, 1854.

Vice President BRIDGES in the Chair.

Mr. Wm. Parker Foulke asked the attention of the Academy to a Lecture by Mr. Hugh Miller, recently republished in the United States, under the title, "The Two Records, the Mosaic and the Geological;" and made some remarks upon the importance of maintaining a careful scrutiny of the logic of the natural sciences. The cultivators of those sciences are particularly interested at this time in preventing any misapprehension of the results of their researches, as there is a prevailing disposition to "reconcile" these by extreme processes with the popular interpretation of certain texts of the Mosaic history. Unfinished investigations of the students of nature are used as complete evidence; and provisional generalizations are employed as fixed premises, from which are drawn conclusions very inconvenient to subsequent inquirers and writers. Thus both religion and natural science are wronged.

Mr. Miller teaches that in the attempt to reconcile the two "records," there are only three periods to be accounted for by the geologist, viz., "the period of *plants*, the period of *great sea monsters and creeping things*; and the period of *cattle and beasts of the earth*;" and that the first of these "periods" is represented by the rocks grouped under the term *palæozoic*, and is distinguished from the *secondary* and *tertiary* chiefly by its "gorgeous flora;" and that the "geological evidence is so complete as to be patent to all, that the first great period of organized being was, as described in the Mosaic record, peculiarly a period of herbs and trees yielding seed after their kind." The general reader, not familiar with the details of geological arrangement, could not fail to infer from such a statement, used

for such a purpose, that the palæozoic rocks are regarded by geologists as forming one group, representative of one period which can properly be said to be distinguished *as a whole* by its gorgeous flora; and that it is properly so distinguished *for the argument in question*. It was familiar to the Academy as well as to Mr. Miller, that from the carboniferous rocks downward (backward in order of time) there have been discriminated a large number of periods differing one from another in mineral and in organic remains; and that the proportion of the carboniferous era to the whole series is small, whether we regard the thickness of its deposits or its conjectural chronology. It is only of this carboniferous era, the latest of this series, that the author's remarks could be true; and even of this, if taken for the entire surface of the earth, it could not be truly asserted that "the evidence is so complete as to be patent to all" that the quantity of its vegetable products distinguishes it from the earth's surface during the era in which we live. To confound by implication all the periods termed palæozoic, so as to apply to them as a whole what could be true, if at all, only of the carboniferous period, is a fallacious use of a generalization made for a purpose and upon a principle not properly available for the writer's argument. The high esteem in which the character of Mr. Miller is deservedly held by readers in the United States, where his writings are widely circulated, and the respectful manner in which his interesting researches have occasioned his name to be mentioned by authors eminent in the department of geology, give to such of his writings as bear upon the biblical question, peculiar importance with reference to the community at large.

Mr. F. urged the duty of insisting upon the maintenance of regular methods of exposition as well as of investigation; leaving apparent inconsistencies, which are beyond our means of explanation, to be "reconciled" by our successors with the aid of larger accumulations of knowledge than we possess. The progress of science has been retarded by the assumption that every

discovery must be immediately proved to be harmonious with certain other portions of our knowledge. A due regard to the sacredness of religious faith and to the natural sensitiveness of the popular mind will secure respectful caution; but it is most consistent with the acknowledged imperfection of human faculties, and at the same time most worthy of the true dignity of science, to assume that ultimately all truths will be found to agree; and meantime, strictly adhering to the canons of evidence, to explore courageously the great field open to us. We ought especially to avoid generalizations which have no sound philosophical principle, or which are framed or applied merely from a desire to appease over-zealous minds ignorant of the facts already ascertained. This obligation is stronger in proportion to the degree of confidence given to the teacher in any case, and also in proportion to the limitation of access to other sources of information.

THE TESTIMONY OF THE ROCKS, OR GEOLOGY IN ITS BEARINGS ON THE TWO THEOLOGIES, NATURAL AND REVEALED. BY HUGH MILLER, Author of "The Old Red Sandstone," "Footprints of the Creator," &c. &c. Boston: Gould & Lincoln. 1857.

[*Note on pages 171, 172, 173, 174, 175.*]

It will be seen that there is no attempt made in this lecture to represent the great Palæozoic division as characterized *throughout its entire extent* by a luxuriant flora. It is, on the contrary, expressly stated here, that the "plants of its earlier and terminal formations (*i. e.* those of the Silurian, Old Red, and Permian Systems) were *few and small*," and that "*it was only during the protracted eons of the carboniferous period that they received their amazing development, unequalled in any previous or succeeding time.*" Being thus express in my limitation, I think I have just cause of complaint against any one who

represents me as unfairly laboring, in this very composition, to make it be believed that the *whole* Palæozoic period was characterized by a gorgeous flora;* and as thus sophistically generalizing in the first instance, in order to make a fallacious use of the generalization in the second, with the intention of misleading non-geological readers. Such, however, as may be seen from the following extracts from the "Proceedings of the Academy of Natural Science at Philadelphia," is the charge preferred against me by a citizen of the United States.

"Mr. William Parker Foulke asked the attention of the Society to a lecture by Mr. Hugh Miller, recently published in the United States under the title of 'The Two Records, Mosaic and Geological,' and made some remarks upon the importance of maintaining a careful scrutiny of the logic of the natural sciences. . . . Mr. Miller teaches that, in the attempt to reconcile the two 'records,' there are only three periods to be accounted for by the geologist, viz. 'the period of *plants*; the period of *great sea monsters and creeping things*; and the period of *cattle and beasts of the earth*;' and that the first of these periods is represented by the rocks grouped under the term *Palæozoic*, and is distinguished from the *Secondary* and *Tertiary* chiefly by its gorgeous flora; and that the geological evidence is so complete as to be patent to all, that the first great period of organized being was, as described in the Mosaic record, peculiarly a period of herbs and trees, yielding seed after their kind. The general reader, not familiar with the details of geological arrangement, could not fail to infer from such a statement, used for such a purpose, that the Palæozoic rocks are regarded by geologists as forming one group representative of one period, which can properly be said to be distinguished as a *whole* by its gorgeous flora; and that it is properly so distinguished *for the*

* [It was not said that the author asserted this as a geological fact; but that he used an argument which *logically* required the assumption of such a characteristic to make the reasoning valid. The reader is requested to recur to page 2.]

argument in question. It was familiar to the Academy, as well as to Mr. Miller, that from the *carboniferous* rocks downward (backward in order of time), there have been discriminated a large number of periods, differing from one another in mineral and in organic remains ; and that the proportion of the *carboniferous* era to the whole series is small, whether we regard the thickness of its deposits or its conjectural chronology. It is only of this *carboniferous* era, *the latest of this series*, that the author's remarks could be true ; and even of this, if taken for the entire surface of the earth, it could not be truly asserted that 'the evidence is so complete as to be patent to all,' that the quantity of its vegetable products distinguishes it from the earth's surface during the era in which we live. To confound by implication all the periods termed Palæozoic, so as to apply to them as a whole what could be true, if at all, only of the *carboniferous* period, is a fallacious use of a generalization *made for a purpose*, and upon a principle not properly available for the writer's argument," &c. So far the "Proceedings" of the Academy.

This, surely, is very much the reverse of fair. I, however, refer the matter, without note or comment (so far at least as it involves the question whether Mr. Foulke has not, in the face of the most express statement on my part, wholly misrepresented me), to the judgment of candid and intelligent readers on both sides of the Atlantic.

I know not that I should recognize Mr. Foulke as entitled, after such a display, to be dealt with simply as the member of a learned society who differs from me on a scientific question ; nor does his reference* to the "carboniferous era" as "*the latest of the*" Palæozoic "series," and his apparent unacquaintance with that Permian period,† in reality the terminal one of the division during which the Palæozoic forms seem to have gradually died

* [There is no such reference. See pages 5 and 16.

† [Nothing required the Permian to be mentioned.

away, in order to give place to those of the Secondary division, inspire any very high respect for his acquirements as a geologist. Waiving, however the legitimacy of his claim, I may be permitted to repeat, for the further information of the non-geological reader, that the *carboniferous* formations, *wherever they have yet been detected*, justify, in the amazing abundance of their carbonized vegetable organisms, the name which they bear.* Mr. Foulke, in three short sentences, uses the terms “carboniferous era,” “carboniferous rocks,” “carboniferous period,” four several times; and these terms are derived from the predominating amount of carbon (elaborated of old by the plants of the period) which occurs in its several formations. The very language which he has to employ is of itself a confirmation of the statement which he challenges. For so “patent” is this *carboniferous* character of the system, that it has given to it its universally accepted designation,—the verbal sign by which it is represented wherever it is known.* Mr. F. states, that “if taken for the entire surface of the earth,” it cannot be truly asserted that the carboniferous flora preponderated over that of the present time, or, at least, that its preponderance could not be regarded as “patent to all.” The statement admits of so many different meanings, that I know not whether I shall succeed in replying to the special meaning intended by Mr. Foulke. There are no doubt carboniferous deposits on the earth’s surface still unknown to the geologist, the evidence of which on the point must be regarded, in consequence, not as “patent to all,” but as *nil*. They are witnesses absent from court, whose testimony has not yet been tendered. But equally certain it is, I repeat, that wherever carboniferous formations *have* been discovered and examined, they have been found to bear the unique characteristic to which the system owes its name,—they have

* [Doubtless; but this is applicable to the carboniferous period alone, *not to all the periods termed Palæozoic*, of which the carboniferous is only the penultimate, according to the author himself.

been found charged with the carbon, existing usually as great beds of coal, which was elaborated of old by its unrivalled flora from the elements. And as this evidence is certain and positive, no one would be entitled to set off against it, as of equal weight, the merely negative evidence of some one or two deposits of the carboniferous age that did not bear the carboniferous character, even were such known to exist; far less is any one entitled to set off against it the *possibly* negative evidence of deposits of the carboniferous age not yet discovered nor examined; for that would be simply to set off against good positive evidence, what is no evidence at all. It would be to set off the *possible* evidence of the absent witnesses, not yet precognosced in the case, against the express declarations of the witnesses already examined, and strong on the positive side.

Surely an American, before appealing, in a question of this kind, to the bare possibility of the existence somewhere or other of barely negative evidence, ought to have bethought him of the very extraordinary positive evidence furnished by the carboniferous deposits of his own great country.* The coal fields of Britain and the European continent had been wrought for ages ere those of North America were known, and for ages more after it had been but ascertained that the New, like the Old World, has its Coal Measures. And during the latter period the *argument* of Mr. Foulke might have been employed, just as now, and some member of a learned society might have urged that, though the coal fields of Europe bore evidence to the former existence of a singularly luxuriant flora, beyond comparison more vast than the European one of the present day, the same could not be predicated of the American coal fields, whose carbonized remains *might* be found representative of a flora which had been

* [The object of this re-print is to counteract a misapprehension. As illustrative of the hazards incidental to criticism at a distance, it may not be in bad taste to mention that the American particularly referred to in the text has been, during a dozen years, in part owner, and repeatedly a visitor, of thicker beds of coal than our author ever saw. See page 17.

at least not more largely developed than that existing American flora to which the great western forests belong. Now, however, the time for any such argument has gone by; the American coal fields have been carefully explored; and what is the result? The geologist has come to know, that even the mighty forests of America are inconsiderable, compared with its deposits of coal; nay, that all its forests gathered into one heap would fail to furnish the materials of a single coal seam equal to that of Pittsburg; and that centuries after all its thick woods shall have disappeared before the axe, and it shall have come to present the comparatively bare, unwooded aspect of the long civilized countries of southern Europe, it will continue to derive the elements of its commercial greatness, and the cheerful blaze of its many millions of domestic hearths, from the unprecedentedly luxurious flora of the old carboniferous ages. Truly, very wonderful are the coal fields of Northern America! If geologists inferred, as they well might, that the extinct flora which had originated the European coal vastly outrivalled in luxuriance that of the existing time, what shall be said of that flora of the same age which originated the coal deposits of Nova Scotia and the United States,—deposits *twenty times as great* as all those of all Europe put together!

PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF
PHILADELPHIA, VOL. IX.

May 5th, 1857.

Vice President BRIDGES in the Chair.

Mr. W. Parker Foulke requested permission to submit to the attention of the Academy some observations of the late Mr. Hugh Miller, printed in his recently published work, entitled "The Testimony of the Rocks."

It may be remembered, said Mr. F., that about three years

ago I noticed at one of the stated meetings of the Academy, what appeared to me an interesting example of the fallacious use of a generalization—the inference from a term used in one sense of what could follow from it only when used in another sense. From the fact that the carboniferous rocks lie within the series which geologists, for special reasons, group into one system which they call the “palæozoic,” Mr. Miller had thought himself authorized so far to treat this system as a unity, as to consider it properly characterized as a whole, for the object of his argument, by the carboniferous member ; and thence to infer that the palæozoic periods together constituted the Mosaic day during which the creation of vegetables took place. No influence had been allowed to the fact that distinctive types of *animal* organization had been the chief motive for the discrimination between the “palæozoic” and “secondary” rocks as two systems ; but the distinction being thus adopted by others, the author had assigned one of the systems entire to the vegetable creation, and the other to that of reptiles.

You will remember, Mr. President, that, before the time to which I refer, it was a subject of private remark amongst the members of the Academy, that a large portion of the zeal and talent employed in drawing conclusions from the generalizations of discoveries in natural science, was applied to premature inferences, or in disproportionate subordination to incomplete metaphysical inquiries. This evil was not confined to men of one pursuit, or of one school ; but it affected every department of “natural science,” and of the abstract sciences most nearly connected with it. In geology, as well as in ethnology, philology, and general natural history, we had frequent occasion to notice the conflict of unnecessary speculations, and of irrelevant or unseasonable inferences ; and the temporary withdrawal of much mental activity from the legitimate paths of scientific inquiry. The interval is short since the investigations of our day were fairly opened ; and already the necessary subdivisions of

labor are so numerous as to demand the most sedulous devotion to each. Yet we saw laborer after laborer diverging from his road to engage upon one or another side of metaphysical controversies, which could not be finally determined except by methods proper to the natural sciences ; nor even by these, unless after greater accumulation and more accurate generalization of facts than had been accomplished. In the eagerness excited by these controversies, we also noticed, especially in respect to such as were of a kind to attract popular attention, that there was caused a bias unfavorable to the ascertainment of fact ; and that the legitimate uses of actual discovery were thwarted by irregular processes, which for the most part were unconsciously adopted, but which were not for this reason the less pernicious to the progress of natural knowledge. In these circumstances, the rationale of the methods employed by writers upon natural history or the physical sciences in general, became a peculiarly important subject for the scrutiny of the Academy ; and in formally presenting that subject, I felt assured that my propositions would serve only as the means of concentrating thoughts already entertained by the members. To give a suitable illustration of the irregularity in question, there were several reasons for selecting the discourse of Mr. Miller, entitled "The Two Records, the Mosaic and the Geological." It had just been republished in this country ; its author was widely known in both hemispheres by his interesting discoveries in the old red sandstone ; and, because of his having written so as to be easily understood by persons not previously skilled in geology, his publications had been read by probably a larger number of persons than had before undertaken the perusal of treatises on the same subject. Moreover, he had written with special reference to several leading controversies which engaged the popular attention ; and his works were frequently appealed to with more or less pertinency in relation to the Noachian deluge, the origin of the varieties in the animal and vegetable kingdoms, and the geographical distri-

bution of species. He thus served as a medium of communication between the studies of scientific men, and the speculations of the general reader. Lastly, his character and motives were unimpeached; and thus the force of personal considerations was added to those of learning and judgment. I was careful, Mr. President, to announce at the outset, that what was intended in my criticism had reference to the "logic of the natural sciences;" but under the comity proper between this Academy and the cultivators of those sciences throughout the world, it certainly did not appear to me necessary to disclaim all design to charge upon any person a *wilful* misuse of reasoning. Nevertheless, as a manifestation of the feeling with which the essay of Mr. Miller was reviewed, I used these words, which were printed in our Proceedings: "The high esteem in which the character of Mr. Miller is deservedly held by readers in the United States, where his writings are widely circulated, and the respectful manner in which his interesting researches have occasioned his name to be mentioned by authors eminent in the department of geology, give to such of his writings as bear upon the biblical question, peculiar importance with reference to the community at large." There was, therefore, no question proposed upon matter of fact, nor any imputation upon the motives of Mr. Miller. My remarks obtained the general concurrence of the members who heard them; at whose instance, and not at my own, the minute of them made by the Secretary was published with the other proceedings of the evening.

Sharing with you, Mr. President, and our fellow members, the profound sentiment produced in this country by the melancholy scenes which closed the useful life of Mr. Miller, I am sure of your participation with me in the surprise and regret with which I have read the following paragraphs, at pages 171, 172 and 173* of "The Testimony of the Rocks." (Mr. Foulke here read the passages referred to.)

* Boston Edition, 1857.

That a member of this Academy could be permitted to make, against such a man as the lamented deceased, a gratuitous charge of *intentional misrepresentation*; and that the charge could be deliberately sanctioned, and printed under your authority and that of the other distinguished gentlemen who were present at the meeting of May 9, 1854—some of whom are now here—seems so far beyond any license known to a respectable association, that I confess myself at a loss to find an acceptable explanation of the credence which has been given to the supposition. I need not say, in this Hall, that the thing is impossible. Mr. Miller is no longer among the living; the hand of death has removed restraints which might have prevented the voluntary proffer of any denial of such an imputation as is implied upon me, upon you, and upon our associates, by the paragraphs which I have read to you. I shall have your and their approval, when I give to the memory of the deceased, as a tribute of respect, the most emphatic disclaimer of any thought which could impeach the integrity of his motives in the construction of his argument; or which could attribute to him conscious neglect of the rights of others, in that most unfortunate interpretation which he has put upon the proceedings of this body.

Having said thus much towards the dead, let me add a few words in the way of caution to ourselves. Each of us is engaged in some pursuit which touches adversely the opinions, the prejudices, the self-love, perhaps the religious sentiment of a portion of mankind. Even in what might appear to an unimpassioned observer the most tranquil of occupations, there arise competitions; and the very love of truth often makes us impatient disputants. We have seen that under a sudden sensibility to a logical criticism, not so phrased as expressly to forbid the meaning erroneously attributed to it, a stranger, with no cause of quarrel, has been supposed by an author of respectable fame to make an accusation of mendacity against him; and a learned body of established reputation has been believed to have promoted

the publication of the charge. To a judgment thus unconsciously clouded, see how naturally all that followed became distorted. I had said that the proceeding of the author was "a fallacious use of a generalization made for a purpose, and upon a principle not properly available for the writer's argument;" and the author forgetting the distinction between a *fallacy* and a *falsehood*, and overlooking too the grammatical relation of the parts of the sentence, italicized the words "*made for a purpose*," so that his readers could not avoid the suggestion that it was the "*fallacious use*" and not the "generalization," which had been said to be *made for a purpose* inapplicable to his object. Nay more; such was the effect upon the author's mind, that he closed his quotation with an "&c." at the very point at which began the sentence which I have read to you, referring to the "esteem in which he was *deservedly* held in the United States"—took no notice whatever of the tenor of that sentence, but said, "so far the Proceedings of the Academy." It need not surprise you, sir, after such examples, to find that I am said to treat the carboniferous period as "the latest of the palæozoic series." A glance at my phraseology will be sufficient to show you that the "series" referred to was one reckoned "from the carboniferous rocks downwards, (backward in order of time,)" and that the rocks in this series were selected by me to show the inconsistency of the argument with the facts; and that my choice had no connection with the limitation of the palæozoic *system*. That my use of the word *series* was not a novelty, may be easily shewn by reference to British as well as American authors.* I have no wish to multiply these observations; my peculiar personal interest in the misapprehen-

* "The use of the word *series* in describing the subdivisions of the palæozoic system, is by no means an innovation, but is, on the contrary, a return to the language formerly in very common use among the members of the Geological Society, as any one may see on turning over the pages of the early volumes." *Synopsis of the Classification of the British Palæozoic Rocks. By the Rev. Adam Sedgwick, M. A., F. R. S., Woodwardian Professor and Fellow of Trinity College, Cambridge.* London, 1855.

sions of the author, ends with the explanation which has been made in relation to that which wounded his feelings; yet, in illustration of the reflection to which my last remarks have been directed, it may not be improper to mention two or three additional examples. Thus, although a member of this body, surrounded by the choice geological library through the use of which so many Americans have become known abroad for learning in natural science, it is assumed that I am ignorant of the relation of the "Permian" rocks to the Palæozoic system—a relation indicated during at least twenty years in elementary treatises. Again; although a citizen of Pennsylvania, a State one of whose most remarkable evidences of wealth is the fact that she is the holder of the great anthracite basin and of a portion of the chief bituminous measures—although a resident of Philadelphia, whose principal domestic export is coal, it is assumed that I could overlook the fact that there are vast deposits of coal in North America. It ought, perhaps, to be said in this connection, that the author has wholly misunderstood my observations with respect to the comparative quantities of vegetable product in the carboniferous period and that in which we live. Considering that we do not know the extent of the area of growth in the carboniferous period, nor the length of time consumed in forming the deposits of vegetable matter which make the coal beds; and taking into view solidity as well as size, and the multiplication of individual growth, it is certainly not going very far to say that it is not "patent to all" that the total quantity of vegetable growth upon the earth during a given space of time was greater in the carboniferous than in the present period. I made no affirmative assertion; and in the absence of conclusive proof, I have none to make now. It is enough to indicate the irrelevance of the reasoning employed by the author upon pages 174 and 175.

With respect to the scientific criticism which has occasioned these remarks, it gives me no concern. It, or its equivalent,

will be judged by proper persons. It has been in the hands of many whose minds have been disciplined in the best methods of inquiry; and from no quarter had I reason to suspect the existence of dissent until the appearance of the book before us. It is to be hoped that on both sides of the Atlantic there will be cultivated a mutual confidence, which shall prevent misconception of motives; and that hereafter the vigilance which is indispensable to preserve the pursuits of philosophy from unconscious bias, shall not be misconstrued as the intrusion of an unfriendly spirit. *Felix quem faciunt aliena pericula cautum.* In conclusion, I beg to renew the expression of my regret, that any accident should have made me the occasion of pain to a gentleman so deserving of our consideration and friendly esteem as was the author of "The Testimony of the Rocks." It cannot but enhance the appropriateness of such an expression at this meeting, that beside yourself and your colleague, the other Vice President, who usually preside over the deliberations of the Academy, I see here to night its venerable President, and several other learned members whose names are familiar to cultivators of the natural sciences in Great Britain.

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Vice President FRAZER in the Chair.

Mr. William Parker Foulke requested permission to make a statement in relation to some remarks of the late Hugh Miller, upon pages 171 to 175 of his recently published book, entitled "The Testimony of the Rocks." [Boston edition, 1857.]

It appeared that Mr. Miller had so far mistaken the spirit and phraseology of a brief criticism upon his reasoning, as to believe

that he had been charged with *intentional misrepresentation*. This was the less to be expected, as the criticism had been published by one of the leading scientific societies of this country as a part of its proceedings; and had been purposely guarded by express mention of "the esteem in which the character of Mr. Miller is deservedly held in the United States"—a phrase the intended value of which was so little seen by him that he has omitted to quote it, although originally printed in juxtaposition with the extract which he republishes.

The melancholy associations now connected with the writings of Mr. Miller, seemed to Mr. F. to suggest as proper the proffer by him of a disclaimer of any such imputation as had been, without full consideration, supposed by the lamented author. Although grieved by that supposition, Mr. F. wished to offer to the memory of the deceased the tribute of that denial which the truth warranted; and he sought to do this here, because it especially concerned the American Philosophical Society to promote by its influence the maintenance of that comity which is proper to the intercourse of the friends of learning throughout the world. He did not propose to discuss the question raised as to the validity of the reasoning employed in the book referred to. That would be judged in due time by well informed readers. He had assumed no facts which are not stated by all the latest elementary writers on geology, and he was sure that a closer consideration of the phraseology of his criticism would have convinced Mr. Miller that, not only in respect to his motives, but also in respect to the geological facts assumed, a correct acceptance of that phraseology rendered irrelevant the comments made upon it. Mr. F. requested that his disclaimer might be noticed in the next printed proceedings of the Society.



