

2211/23/45 9th of 11th mo 1869

My dear
Miles Barnesville this
Esteemed Friend

Box 93. Belmont Co

J. W. Dawson, I have recd a few

pamphlets which I suppose were sent by thee
I read them with much pleasure, and I un-
derstand by their arrival that my letter
was favorably received. by thee, I hope when
thou hast read this communication
thou wilt understand me, and should thou
feel interested in what I have written, I
should be pleased to have a few lines expressing
of thy opinion thereon.

I deem a few explanatory remarks
would be proper at this time.

I have called the theory that I have
advanced, the "Millerian theory" in
honor of an old friend of mine named
Morris Miller, a man who has been
an engineer, surveyor, & contractor in
the construction of canals & railroads.
He is a natural geologist, of great ob-
serving powers, possessing a penetrating
intellect, - He has furnished me with
a great deal of information, & this to-
gether with what I have collected forms
the "Millerian theory" a work now en-
deavouring to prepare for the press, and
from which I have culled & penned
to thee, a few particulars, thou wilt
have collected to enjoy the honors of
our discoveries, mutually, and being
a man, ungifted ^{with} a communicative advan-
tage, I devolve upon me to bring the
subject before thee, and the world.

I have already been very successful
in learning with what indifference
scientific men in a collective capacity—
receive young enthusiasts. But there
is a theory that I hold to say, will
solve the glacial question (in this land)
for ever or rest. The Millierin theory
when finished will comprise about
400 octavo pages; But Providence
has denied me the advantages of the
society of learned men. Mine has
in a great measure been the school of
poverty. The only way I can bring this
to the light of science is by exhibiting on
myself some influential man; For
the sake of this, I am willing to presume
so much as to address my superiors,
And Oh! but for one day talk with
them. I know, or I almost know, those
would endorse my theory entire. It
is so demonstrative that I am not
afraid to meet the entire scientific world,
I have exhorted much in traveling, in
various parts of the drift basin, with eyes
open. In consequence, I now earn
my bread by the sweat of my face, yet
I have that which money could
deprive me of.

I have said in this letter that the drift comes
from the west; I mean the low pine mountains
that are washed down by rivers; the Arctic
come from the Laurentian ridge, and are
deposited in a sea of fresh water, that
covered 9 or 10 square miles of surface,
the existence of fresh lakes in the drift I
consider a significant fact;

Excuse me my friends if I have trespassed
to lay upon thy generosity;
Respt. thy friend Isaac N. Vail

The following considerations are presented as a refutation of the "American Glacial Theory," as advanced and maintained by Agassiz,

| |
|-------------------------------|
| McGILL UNIVERSITY ARCHIVES |
| ACC. NO. 2211/23 |
| REF. 40 |

We hold that in no place in the Mississippi Valley has the drift-agent existed above the water line of 1265 feet. ^{above the "level"} Proof:—The southern boundary of the drift—as established by a critical examination, for that purpose, is as follows, and we pledge ourselves to prove the same by an ocular demonstration to any one that will follow us to the spot.

From the northern angle of the Allegheny Mts. the southern limit of the drift—in a line passes around the northern side of the Chataqua Lake in the state of N.Y. Thence it bears a little south till it enters the state of Pa. and passes through Erie & Crawford counties, thence east of south to the southeastern part of Butler county. Here it turns with almost an acute angle to the west, & crosses Beaver County, approaching within three miles of the Ohio river, where the Big Beaver empties in that stream. It enters the state of Ohio 11 miles south of the north line of Columbiana county—thence due west, through this & Stark counties, entering Holmes co. near its north east cor. & leaving it in the S.W. cor. It passes between the counties of Knox & Cassiopolis, crosses Licking & Fairfield & Peaway & Fayette & Clinton Warren & Butler counties, thence in a westward course it bears a little south, then the states of Indiana & Ill. crossing the Mississippi a little below the mouth of the Kaskaskia R. at the "Grand Tower." From this point westward the Ozark mountains form an uninterrupted barrier. This whole line is an elevated ridge, and was formerly an unbroken one, ~~forming~~ ^{forming} the whole length between the Ohio valley & the Lake basin. Its elevation in no place is less than 700 feet—above Lake Erie, except where rivers have broken through this barrier. Now on the northern slope of this ridge, the drift (pebbles, Boulders, drift mud—embedded) etc. exist throughout its whole length, and one striking feature is, that this drift is found only on the northern side, and only up to the waterline of 700 feet above Lake Erie or 1245 ft. above ocean level. Geologists will look forever in vain, for a particle of drift, above that line, and they may travel from one end of the ridge to the other. Here in many places the strata are piled "Belgian upon Ossa" many feet deep, and the water-worn pebbles & terraces of sand, etc. mark the shore of a sea, as plainly as the present shore of Lake Erie. This is the southern limit of the drift—there is none south of it, except in the immediate river valleys; no drift on the low hills south of this ancient shore. If there ever was a glacial climate in this continent, doubtless this ridge was the thermal line indicating the southern limit of a glacial climate. Rather a paradox in so level a country. Of this, more in its proper place. ~~What ever~~ ^{What ever} has thus produced the drift phenomena, this is proof enough that that agent did not operate above 1265 feet above the ocean; and if this may not be considered sufficient evidence, we have more to offer: there are

2 are a great many hills that have a greater altitude than 1200 feet, scattered over this wide drift area, they exist in Iowa, Minnesota, Wisconsin, Michigan, Ohio & other states; but there is not a particle of drift on their tops, their sides are covered all around and up to that water line & no higher. These are not unnotable & I specify, though I will give a few localities where they occur. About 2 miles north of the town of Hanover, in Columbiana Co. this state, there stands a hill about 424 feet above the level of Lake Erie, and the midst of the drift, & it has a drift deposit all around it & up its sides to that water line, but not a pebble upon it, or other drift. Not a half a mile from this hill there is another where summit is below the 400 ft line above the lake, and it is covered by immense numbers of boulders and other drift. Again the village of Manservant in said county is surrounded by hills of this description. The city of Akron is on an elevation, where icebergs have undoubtedly left their loads of drift upon their hill sides. This locality is over 200 feet lower than the water line.

These hills thus devoid of drift, must have been isolated, rising above the "floating rock," small peaks that lifted their heads above the so called glacial sheet that surrounded them. Where there is the glacier that came to the top of Mount Washington? Why did not that glacier that was 12 or 14 thousand feet thick, affect hills only 400 feet above the lake, again I ask where is that mighty glacier? Simply in the brain of some A. G. & his coadjutors.

But this is not all the evidence we bring to refute the American Glacial theory. The glacialists maintain that the motion of the glacier, has striated the rocks & polished its bed, "grains up & smices the drift like so much mush" (so says Agassiz) Here is a fatal mistake, a theory founded on appearances only. With the exception of the eastern portion of New York state and N. England entire, and most of the St. Lawrence Valley, the entire drift has been deposited upon an ancient soil & an ancient forest. In our western states the "clay" is deposited immediately upon it. Then it is lying upon the old soil and the forest is generally preserved in it & beneath it. Some times the crops & stumps project through the clay in the sand, & pebbles deposit. Now why did not the mighty glacier grind this ancient forest, and "mush" there are the trees entire there as the limbs unbroken & undisturbed in their original position, or when they were prostrated. We have never found where there are glacial scratches why did it not mix the clay up with the soil? Ah! this "mighty dash" or rather this mighty mush-paddle has not done its work.

The lowest drift deposits appear to have been deposited in shallow water, slowly increasing in depth. That immediately above, are of different nature, or least in this western country, there are occasional boulders to be found, in the lowest, but they appear to have been broken loose from floating icebergs. But above the clay the boulders become more numerous; and that that are striated are found at all depths. But it is not until we arrive among the upper beds or strata that we find fossil drift-wood. Here they are found in

Abundant, which I will - I have before me a specimen taken from a well in Iowa, forty feet below the surface. Many years ago in excavating for the Cayahoga canal in this State we came upon a tree (Cedar) so sound & so straight - This was used it for a timber in the lock near Paducah: we have found limbs & twigs with the leaves on them, plants with flowers & seeds attached, just as they were deposited from water, and none of these late deposits or drift - show any signs of glacial action whatever, and where ever the striations occur, on the subjacent rock no drift - mud of the above character can be found, or at most - to a very limited extent, these striae occur most abundantly in the river valleys (but of the river in the future) My aged friend found near the town of Hannover, also mentioned the bones of the mastodon, showing that it was also an inhabitant - on the coast - soil above referred to, we saw it & exhibit - Now a bone of it is exhibit - & says we who may wish to see it, In other localities there have been bones, and the evidence seems to me conclusive that these animals inhabited this ancient soil, and were destroyed by the water that accumulated around them, I ask are not the above facts entirely in connection with the idea of Glacial action?

We hold that the circular ponds & just holes which are found over this wide area of drift - were ^{some time} formed by lodged icebergs. Proof. We have had occasion to dig through them, a great many times; and the following facts - we are pleased to report, they as a general thing occur the higher ground, they mostly occur on the north side or slope. They invariably contain boulders and some of them of immense size, some of them are forced into earth by great pressure some of them lie on the bottom on the subjacent rock. Some times a boulder is found in the bottom, with its underside smooth & polished & lying in a concavity made in the rock most undoubtedly by the oscillation of the berg, thus a berg, has been lodged on a hillside, & some times on a hill top, in favorable seasons every storm or heavy blast of wind would cause it to rock & for every wave would add to its weight by congelation, and every motion sink it deeper into the earth; and thus it would grind and polish the boulders and excavate a hole, which often times become a pond, but this is not all, Every motion of the lodged berg, stirring up the mud, it would be floated off in the direction of the current; the fine mud would settle further down the pond. The fine sand would - the coarse sand still nearer, and the pebbles would be left on its margin the boulders within it; Now this has been found to be the case, I believe in every case we have examined - This separation of material is so well known to the inhabitants in the localities where they occur, that they know how near to go to the pond to dig for the required kind of sand, In some cases this mud & fine sand has been floated on an elevation, and deposited at an angle, I ask can glacial action account for this? May be, In excavations we have frequently crossed the track of an

of an iceberg. Showing some times a wedge & some times a narrow fissure or crack filled with sand; one of them was not more than 3 feet wide and 9 feet deep. some larger, or, under not so deep some were scratches; They have merely pushed the drift wood to one side, but we have never seen them crushed or mangled as they must have been done by a glacier; some times a log has been snapped into one piece left on one side of the furrow, and the other on the other,

Thus my friend I have given thee a few (only) of the mighty array of facts - that must sooner or later come to "American Glacial theory" & fall with a sudden & terrific crash: But - I have only made a beginning, if I can, or if I have succeeded in awakening an interest in thy mind, & convince our theory; I shall by a few letters during the coming summer, as my other duties will permit, give thee some more particulars; But I hesitate to write - lest I meet at the hand of a stranger, no better success than I have from others; few seem to be able to comprehend the magnitude of this subject, - tho' which all I believe have had to acknowledge the force of evidence which I have given. I have now appealed to one whose views somewhat coincide with my own, I have read thy pamphlet with delight. In vain have I tried to gather from travelers an idea of the character of the pebbles on the New England Mt. Prof Jones a geologist from Mass who is now residing in Salem Ohio fully acknowledges the force of our theory, but claimed that the drifts of these mountains showed them to have been deposited on them since their elevation; But the conditions of the drift in the west show that these mountains were raised from the ocean, with all their drift upon them. This I am satisfied I can prove with the strongest evidence. I have not settled this point in my mind, or then not visited them. This I have never done. That is, in reference to glacial marks; those however I claim were formed by floating icebergs in the flow of the ocean, before the mountains were heaved from the ocean. These so called mountains, were formed by currents of water forcing them way under vast, lodged, countries of ice. That in the west, were undoubtedly thus formed as well as many of its lakes. As the Millerian theory claims to show.

It shows that - the drift of the west & that of the east (ie, in N. Eng) are not contemporaneous; The former being lacustrine and the latter marine in origin (in the west) It proves ^{that} little uniformity of the direction of striations. It accounts satisfactorily for the absence of marine shells, west of Kingston, it shows that in a part of N. Y. & Canada a lacustrine deposit was affected after that of the marine, but that a great part of both has been washed away, along the St Lawrence. It shows that the most of the drift east of the N. Eng, was, come not from the east but from the west; It shows that the Missouri River & many other streams formerly flowed through the Great Lakes; That the Mississippi was not; It satisfactorily accounts for the filling up of the old channel of the Niagara, and change of that stream to its present course; I am loath to cease, but I must.

With much regard I remain, thy friend J. V. D.