

(4)
cannot say; but it is altogether probable
that in this era of submergence the
Caspian and Aral were connected with
the Arctic. It is admitted by the
Swedish geologists that the Baltic
communicated with the White Sea by
a channel leading northward over ~~the land~~
Northern Siberia ^{experienced} the mild
climate ^(probably an error on that point, "cold temperate" is good) as the herds of heavy ele-
phants - or rather their remains - prove.

As to the depression of northern
Siberia, we have no facts. It is an
immense alluvial region without
boundaries; and it is my opinion that
the deposits were made chiefly by
the ~~flowed~~ ^{flooded} streams during the
melting of the ice of the Altai Mts;
as a sequel to the glacial era.

As to Europe being a peninsula
since inhabited by *Segnoia* &c.: This
was a fact, ~~in~~ that era of submergence
~~if~~ the Caspian-and-Aral region was
then connected by salt water with
the Arctic seas. But it was ^{probably} not true
in the Pliocene & Miocene. In the
Eocene, Europe was a group of large
islands.

New Haven
March 15th 1878

My dear Gray; — In the Miocene
there was an extended submergence
of Arctic lands, as we know from
the Miocene deposits. The depth
of the submergence I have not
seen stated — I suppose not
great. The height of the Miocene
deposits would determine it, and
no account of these which I have
met with gives it. [Perhaps 200-300 feet.]

The evidence of land communica-
tion at this time between America
and Europe rests wholly on the
identity of American and European
Miocene, or later, plants & animals.
I regard the evidence as good. —

(2) The region between Scandinavia, Iceland, and Greenland I believe, or think, was under water as now; for if not, the Gulf Stream could not have flowed into the Arctic seas and contributed to their warmth (helping thus a Pacific tropical current, or "gulf stream" flowing northward over the submerged regions of Behring's strait?); but there may have been a connection between Asia & America directly across the polar regions, or any where that would not have interfered with the Gulf Stream.

I come now to your question as to the lands north of us being higher in the glacial era. The evidence is pretty strong that the land was higher; and it is probable that there was land communication across from Europe to America; and there may have been migration between the continents before the ice had fully set in, and had made the way impassable. ^{that there was such migration} ^{in generally admitted circumstances}

I think that the ice of the glacial era was due to a shallowing of the ocean between Britain, Iceland and Greenland, so that the Gulf

stream was thus excluded from the (3) Arctic regions.

Then, secondly, as to subsidence since; The fact of a lower level of the land is admitted by all, the only difference ^{among geologists} being that some speak of the subsidence as having been begun in the glacial era. It is proved by the existence of beds of recent shells on various Arctic lands at heights of a thousand feet and less; and even 1800 feet at Polar's Bay, Greenland; of similar beds on the coast of Labrador at a height of five hundred feet, and probably, says Packard, of 800 feet; near Montreal at a height of 470 feet; on the coast of Maine to a height of 217 feet, etc.

I have held the view that this subsidence of the northern regions brought on a milder climate and so promoted the melting of the ice. The remains of mammalian life found in Britain and in northern Europe and Asia, as well as in northern America, are proofs of a warmer climate.

as to Sahara and lower Egypt I

a few geologists still hold to the ⁽⁵⁾ view that the boulders of Europe were distributed by ice bays, and just the northern part of Europe down to latitude 50° ^{excepting the Scandinavian mtn range} under salt water. Thus they make the submergence, spoken of above, a very much greater one than is sustained by facts. I do not believe in such a marine submergence where there are no marine fossils, or other relics, to indicate it. and this would not make a peninsula of the continent, as it would only ~~cause it~~ contract it on the north.

In North America the ice sheet extended about to the parallel of ~~49°~~ 39°, and it reached west of the Mississippi to western Iowa. West of Mis, on the great interior of the Continent to the Sierra Nevada and Cascade Mts, the evidences of the great northern glacier fail, owing undoubtedly to the dryness of the climate and the warmth of the summer. There were however extensive local glaciers about the summits of the Rocky Mts in the glacial era. ————— If I

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(6)
have not been sufficiently explicit
in my answers to your questions,
you must ask again.

My wife has been my Annamensis
again, & I am not yet in satisfactory
condition, altho' going on with my
college duties. —

Dear lady Mary
James D. Dana



Dana, James Dwight. 1878. "Dana, James Dwight Mar. 15, 1878." *James Dwight Dana letters* –.

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