

wise the conclusion that the abnormal mildness of the climate on the north-western coast of Europe is due to a movement of equatorial water in a north-easterly direction. "What I question is the correctness of the doctrine that the north-east flow is an extension or prolongation of the Gulf-stream, still driven on by the *vis a tergo* of the trade-winds—a doctrine which (greatly to my surprise) has been adopted and defended by my colleague Professor Wyville Thomson. But while these authorities attribute the whole or nearly the whole of this flow to the true Gulf-stream, I regard a large part, if not the whole, of that which takes place along our own western coast, and passes north and north-east between Iceland and Norway towards Spitzbergen, as quite independent of that agency; so that it would continue if the North and South American continents were so completely disunited that the equatorial currents would be driven straight onwards by the trade-winds into the Pacific Ocean, instead of being embayed in the Gulf of Mexico and driven out in a north-east direction through the 'narrows' off Cape Florida."<sup>1</sup> Dr. Carpenter does not mean by this to endorse Mr. Findlay's opinion that the movement beyond the 45th parallel of latitude is due solely to the drift of the anti-trades; he says, "On the view I advocate, the north-easterly flow is regarded as due to the *vis a fronte* originating in the action of cold upon the water of the polar area, whereby its level is always tending to depression."<sup>2</sup> The amelioration of the climate of north-western Europe is thus

<sup>1</sup> Dr. Carpenter : Proceedings of the Royal Geographical Society for 1870, op. cit.

<sup>2</sup> Op. cit.