

#### IV.—RELATION OF THE SUPPOSED MIGRATORY MOVEMENTS OF MACKEREL TO ISOTHERMAL LINES.

It is alleged that the American fishermen follow the Mackerel from the southern waters of Virginia all along the coast of the United States to the Gulf of St. Lawrence, and according to the same reasoning they might follow them through the Straits of Belle Isle to White Bay, on the North East Coast of Newfoundland, where they have been taken in abundance.

Similarly it is alleged that in the fall of the year they follow the schools from the Gulf past Cape Breton Island to Virginia waters again.

It is worth while carefully to consider what this extraordinary migration involves. It presupposes the movements of bodies of the same great schools of mackerel, which are alleged to pass Massachusetts Bay from the waters of the coasts of Virginia and New Jersey, not only through from ten to twelve degrees of latitude, but it assumes that they are able to cross in the early summer, and frequently before spawning, numerous isothermal lines in descending order, and chiefly during May, for they appear at the Magdalen Islands at the end of that month. If they came, as is here affirmed they do come, from their winter homes near to their spawning grounds, they would continue in the same isothermal zone, or pass from a lower into a higher coastal or surface temperature, and not from a high into a much lower temperature, which would be the case if they migrated, as alleged, from the south towards the north so early in the season. The influence of the Labrador current in pushing the isothermals to the south is so marked, that it forms a great exception to the general distribution of temperature throughout the world, and influences, in a corresponding degree, marine life near the shores on which it presses. The general southerly and northerly movements of the isothermals in winter and summer on the American coast, may be inferred from the following abstract of Dr. Petermann's resumé of observations published in the *Mittheilungen* for 1870, in the article entitled "*Der Golfstrom*," &c. An inspection of the colored chart illustrating Dr. Petermann's paper, will convey at a glance an idea of the sudden plunging from high to low zones of temperature which would be involved if the alleged movements of the mackerel in the months of May and June were based on actual facts.

According to the subjoined table of Marine Isothermals for July, a school of fish moving rapidly from Delaware Bay to the Straits of Belle Isle, would pass in July from a mean temperature of  $68^{\circ}$  to a mean temperature of  $45^{\circ} 5'$ , a difference of more than  $22^{\circ}$  Fahrenheit. This temperature refers to the surface of the sea, but the difference between the temperatures at different depths near the coast line would very probably be maintained and in some places, as over Banks and, shoals exceeded.