

through these passages the Arctic currents flow and largely occupy the low sea-level, caused by the westerly winds along the American coast from Greenland to Florida. We also see the tropical waters heaped against Mexico, attracted to the same low sea-level, thus causing the Gulf Stream. But the waters of this stream, while on their northern passage, are so obstructed by the opposing Arctic currents, they fail to reach the higher northern latitudes; consequently heavy glaciers have gathered and still are gathering on Greenland and other Arctic shores, and this increase of cold will continue in unison with the growing cold of the Antarctic regions until the Arctic channels are closed with ice, and a northern ice-age completed. But when the Arctic channels are closed, the Gulf Stream will be able to reach a much higher latitude than now, as it would meet with no obstruction except the return current of its own waters, which would probably flow down the east coast of Greenland, where the Arctic waters now flow. Thus, with less obstruction, the movement of tropical waters into the Arctic regions, which, in connection with increasing warmth in the southern hemisphere, would be able to bring about a warm period in the northern latitudes of considerable duration, on account of the glaciers filling the Arctic straits being situated to the windward of the tropical currents, and, in consequence of their cold location, would be the last ice to melt in the northern regions.

It has been the opinion of several writers that should the whole of the warm Gulf Stream water flow into the Arctic Ocean it would probably remove the ice of Greenland, and it is reasonable to suppose that such would be the case. But, as far as I know, such theorists always fail to explain how tropical waters are ever made to flow into the high latitudes. They have nothing to say of the low sea-level trough, caused by the westerly winds, extending from Georgia to Greenland, and thus attracting both the Arctic and Gulf-stream waters in opposite directions over fifteen hundred miles along the American Coast. For were it not for this low sea-level the Gulf Stream would not be able to move so far northward as it now flows, but would spread out, were the Atlantic a level plain, and become a drift current much further southward; especially with the Arctic currents opposing it from the north.

Professor Geikie asserts that there can be no doubt whatever that periods succeeding the Tertiary have been characterized by great oscillations of climate—extremely cold and very genial conditions alternating; and that during the frigid period, where we now have the greatest rainfall, the greatest snowfall took place. He also says, that during such times changes in the relative level of the land and sea had taken place. But he did not believe that there had been any great movement in the earth's crust. For while giving his views on the earth-movement hypothesis he declared that there was not the least evidence of great continental elevations in the northern hemisphere, and even if such improbable earth-movements were admitted they would not account for the glacial period. The assertions of Professor Geikie, that where we now have the greatest rainfall, in glacial times the greatest snowfall took place, shows that the prevailing winds during the cold period must have blown in the same direction they now blow. Consequently, the great ocean currents, being governed by the prevailing winds, were during the glacial period moving in the same direction they now move. But the great Southern Ocean drift current lost its independent movement when the Cape Horn channel was closed with ice; which, according to the common course of nature must again be brought about. Thus, in the future, as in past glacial periods, the strong westerly winds that sweep the Southern Ocean would blow the surface waters away from the leeward side of the ice isthmus and so cause a low ocean-level; and it appears that the only water that could be attracted to this low sea-level would be the tropical water heaped against Brazil by the trade-winds. This tropical water on gaining the low ocean-level would spread over its wide depression, where the westerly winds would cause it to become a drift current, and in this way it would be moved along the shores of the Antarctic continent past the South Indian and South Pacific oceans and eventually be forced against the Pacific side of the ice isthmus and Patagonian coast, and so cause a high ocean-

level. This high level would vastly increase the volume of the Humboldt current, which would flow, as it now flows, down the South American coast to the equatorial latitudes, where it would become the main source of the great equatorial current. The latter current with an increased volume would also move as it moves to-day, across the Pacific, and through the East India passages into the Indian Ocean, where it would flow on partly as a drift current until it joined the great Mozambique current, which would flow southward along the east coast of Africa, the same as it now flows. At this age, when this continuation of the great equatorial stream gains the latitude of the Cape of Good Hope, its waters are largely turned eastward by the great drift current of the Southern Ocean; but a considerable portion of its waters turn towards the west forming the Agulhas current, which flows around the Cape of Good Hope into the Atlantic, where it mingles with the cooler currents, which branch off from the great southern drift current; and so in connection with the latter waters is moved by the south-east trade-winds towards the equatorial Atlantic and coast of Brazil. Thus it will be seen that the Agulhas current, while giving additional warmth to the Atlantic, serves to retard somewhat the advance of the coming cold period.

The Agulhas current also partly serves to replenish the water which at this date is forced from the South Atlantic by the strong westerly winds into the southern Indian and Pacific oceans. For it appears that more water is now removed by such winds from the South Atlantic than enters it from the Cape Horn channel. This channel being less than half of the breadth of the westerly wind-belt of the Southern Ocean, the drift currents do not all pass through it from the Pacific into the Atlantic. Consequently, a considerable portion of the drifting water turns northward west of Cape Horn, and so forms the Humboldt current. Therefore, the Agulhas stream, which even now assists in replenishing the Atlantic, would be a much stronger current with the Cape Horn channel closed; because the South Atlantic waters would continue as now to be forced eastward by the strong westerly winds, yet they could not be replenished as they are to-day directly from the Pacific; therefore, the waters of the whole Atlantic Ocean would be correspondingly reduced. Such conditions alone would greatly swell the warm Agulhas stream at the culmination of a frigid period, and thus greatly assist the Atlantic in its operations while bringing about a warm period. Dr. Croll, in his astronomical theory, declares the ice periods of the northern and southern hemispheres to be consecutive. But when we consider the wide connection and circulation of the tropical seas it seems impossible for a glacial epoch to be perfected in one of the hemispheres with a mild climate extending over the opposite portion of the globe. And it appears to me that the tropical lands I have visited show indications of having at times experienced a temperature sufficiently cold for snow and ice to have gathered on their highlands, and in some locations glaciers may have extended to the sea. Besides it is well known that Alpine plants exist on the high mountains of the tropics; and it also appears that during some ancient period the climate has been favorable for their crossing the lower lands of the torrid zone, which tends to show that the frigid periods of the two hemispheres were concurrent.

C. A. M. TABER.

Wakefield, Mass., June 13.

#### European Origin of the White Race.

I HAVE received so many letters questioning my statement in *Science*, March 25, that Omalius d'Halloy, and not Dr. Latham, was the first to maintain the European origin of the white race, that it seems due to the former scientist, as well as to myself, to quote his words. Even such a thorough-paced archæologist as M. Salomon Reinach, of the National Museum, St. Germain-en-Laye, writes: "Where did you hear that Omalius had presented the European theory before Latham? I am sure that it is not so."

Now if these inquirers will turn to the *Bulletins de l'Academie Royale de Belgique*, Tome XV., No. 5, May, 1848, they will find an article of 16 pages, entitled "Observations sur la Distribution ancienne des Peuples de la Race blanche," par M. J. J. Omalius

d'Halloy, beginning with this sentence: "Dans une série de notes que j'ai présentées à l'Académie de 1839 à 1844, j'ai cherché à faire voir, entre autres considérations ethnographiques, que la race blanche, restreinte dans ce que je considère ses véritables limites, présente trois modifications principales, *et qu'il n'est nullement démontré que les ancêtres des Européens actuels soient venus d'Asie.*" (Italics mine.)

The author then proceeds to discuss the evidence, physiological, historical and linguistic, which had been thought to show that the Indo-European peoples originated in Asia; and combats it at every point, marshalling his arguments to prove that the true white type is distinctly European; and that the ancient Sanscrit and Zend are in no wise maternal languages of the Indo-European stock, but merely sisters of the Greek, Latin, and ancient German.

The earliest expression of this view by Dr. Latham, so far as I know, is that referred to by Professor Haynes, in this journal, April 8, which was published in 1851,—years, therefore, after Omalius had urged the same theory in a number of papers. It is strange, indeed, and regrettable, that an endless chain of writers have given credit where it did not belong for this bold and certainly in great measure correct theory. D. G. BRINTON.

Media, Pa., June 20.

#### AMONG THE PUBLISHERS.

PROFESSOR HUXLEY is collecting his papers on the "Gadarene Swine" and other controversial topics, which he contributed recently to the *Nineteenth Century*, and will issue them with a new preface.

—Fleming H. Revell Company has just ready "Peeps into China," by the Rev. Gilbert Reid, M.A., of the American Presbyterian Board, a series of observations on the manners and customs of the Chinese.

—G. P. Putnam's Sons have ready "Materialism and Modern Physiology of the Nervous System," by Dr. William H. Thomson, Professor of Materia Medica in the University of New York; and "Who Pays Your Taxes?" a compilation by Bolton Hall of the opinions on taxation of David A. Wells, George H. Andrews, Thomas G. Shearman, Julien T. Davies, Joseph Dana Miller, the compiler and others, which is one of the "Questions of the Day Series."

—Ginn & Co. have in preparation "A Students' Edition of the Age of Fable," on the basis of Bulfinch's "Age of Fable" (1855), adapted to school use and to the needs of beginners in English literature and in the classics, in part rewritten, accompanied by interpretative and illustrative notes, by Charles Mills Gayley, Professor of the English Language and Literature in the University of California, and formerly Assistant Professor of Latin in the University of Michigan.

—Longmans, Green & Co. will publish immediately a new edition of Professor Max Müller's lectures on "India: What can it Teach Us?" which were delivered at Cambridge to the candidates for the Indian Civil Service. They will bring out at the same time a new edition of the first volume of Professor Max Müller's "Gifford Lectures," on "Natural Religion," delivered at Glasgow in 1889. Professor Max Müller is preparing for the press the fourth volume of his "Gifford Lectures," on "Psychological Religion," but it is not likely to appear before the end of the year.

—Messrs. D. Appleton & Co. announce for early publication "Controverted Questions," a new book by Professor Huxley; "The Principles of Ethics," Vol. I., by Herbert Spencer; "The Canadian Guide-Book, Part II., Western Canada," a handsomely illustrated volume by Ernest Ingersoll, describing Western Canada from Ottawa to Vancouver, and uniform with "The Canadian Guide-Book, Part I., Eastern Canada," by Professor C. G. D. Roberts, of which a new and revised edition is now ready; "The Naturalist in La Plata," illustrated by W. H. Hudson, joint author of "Argentine Ornithology." New editions, fully revised, of Appletons' well-known "General Guide to the United States and

Canada," and "Appletons' Summer Resorts," are to be published immediately.

—Mr. C. Michie Smith has edited a work embodying "Results of the Meteorological Observations made at the Government Observatory, Madras, during the years 1861-90, under the direction of the late Mr. Norman Robert Pogson." The volume, according to *Nature*, is published by order of the Government of Madras. It was Mr. Pogson's intention to issue the work as soon as he could after the completion of thirty years of observation, and at the time of his death a considerable part of the manuscript was nearly ready for press. In editing the work, Mr. Smith, so far as possible, has retained the original plan. He expresses much admiration for the skill and thoroughness with which the observations were organized and carried out.

—In the *Political Science Quarterly* for June Professor John Bassett Moore continues his study of "Asylum in Consulates and in Vessels," bringing it down to the late affair in Chili; John Hawks Noble presents a concise summary of "The Immigration Question" as it stands at present; Robt. Brown, Jr., gives the salient points in the history of "Tithes in England and Wales;" Professor Ugo Rabbeno, of Bologna, Italy, expounds and criticises "The Landed System of Social Economy," as contained in the works of his fellow-countryman, Achille Loria; Ernest W. Clement discusses "Local Self-Government in Japan;" and Professor A. B. Hart, of Harvard, writing on "The Exercise of the Suffrage," argues against the project of compulsory voting and gives statistical tables bearing on the subject. The book reviews include over twenty publications, and Professor Dunning brings his Record of Political Events down to May 1.

—C. W. Bardeen of Syracuse, N. Y., has published a little pamphlet by Professor N. M. Butler on "The Place of Comenius in the History of Education." It does not sketch the incidents of Comenius's life, and gives only a partial account of his educational theories, the defective parts of his work being for the most part kept out of sight. Comenius held certain notions about the matter and manner of teaching of which Professor Butler himself is a strong partisan, and he is glorified in this pamphlet accordingly. Indeed, our author would have us believe that nearly all those views and practices that go by the indefinite name of "the new education" were anticipated by the Moravian educator who was born three centuries ago. Yet when we come down to facts, we find that his anticipations were often very vague, while many of the ideas he held, and on which Mr. Butler lays much stress, are at the present day little better than fads. The point most insisted upon by Mr. Butler is that Comenius was the first to maintain that education is, or should be, a drawing out and developing of the faculties. But surely that idea is expressed in the etymology of the word *education*, a fact which proves that the idea is very old. Comenius holds an honorable place in educational history, but he was no such paragon as Mr. Butler would have us believe.

—The Clarendon Press, says *Nature*, will publish immediately a second volume of Professor Weismann's work on "Heredity and Kindred Biological Problems." It contains four essays, of which only the shortest has previously appeared in an English form (in the columns of *Nature*). The first essay deals with degeneration, and clearly shows by abundant illustrations that it has resulted from *panmixia*, or the cessation of natural selection. The second is an attempt to explain the development of the art of music, and to show that the hereditary transmission of the results of practice is quite unnecessary in order to account for its rise. The third contains a reply to certain objections urged by Professor Vines. It will be useful in giving clearer expression to the ideas on the death of multicellular beings and the immortality of the unicellular. The fourth and last essay is by far the longest and most important. It deals with the essential significance of sexual reproduction and conjugation, etc., as inferred from the results of the most recent researches. Professor Weismann's older views on these subjects, especially concerning the polar bodies, have been modified and in part abandoned. The immortality of unicellular beings and the question of the transmission of