

species as a group comprising such individuals as are alike in fundamental qualities. But the essential idea of a species then is this:—"A species corresponds to a specific amount or condition of concentrated force, defined in the act or law of creation. 2. Permanence of species. In the animal kingdom there is a great aversion in nature to intermix, and it is emotional as well as physical. Man, by receiving a plastic body, in accordance with a law that species most capable of domestication should necessarily be most pliant, was fitted to take the whole earth as his dominion, and live under every zone. 3. Variations of species. Variation is a characteristic of all things finite, and is involved in the very conditions of existence. No substance can be wholly independent of every or any other body in the universe. Liability to variation is part of the law of species. Variations are not accidents, for nothing in nature is accidental; they are profound laws.

Prof. WILSON, of Toronto, read a paper "on the supposed Uniformity of Cranial Type throughout all varieties of the American Race." He stated that he had prepared his paper with considerable care, as it went to challenge opinions advanced by one recognised by all as the highest in rank among the Ethnologists of this continent—the late Dr Morton, of Philadelphia,—and which opinions had since been accepted as established data of the science by all the eminent writers of the American School of Ethnology. The paper, however, consisted in part of elaborate tables of comparative measurements and details. Professor Wilson gave a verbal extract of the general facts which he believed to follow as established results from the data he had accumulated. In this communication the opinions of Nott, Agassiz, and others, relative to the American Race, and to the whole question of unity and diversity of species, were carefully stated and discussed. Professor Wilson showed that all of these writers had taken for granted the uniformity of the cranial type of the aboriginal race or races of this continent, with the one exception of the Esquimaux, on the authority of Morton; and that if the premises thus assumed proved to be false, their conclusions must fall to the ground. He then showed by drawings, comparative measurements, and detailed statements, that Dr. Morton's generalizations utterly fail of application within the Canadian frontier, and that so far from the Esquimaux being the one sole Mongolic exception, the older Indian races of Canada much more nearly approached in physical conformation to the sole assumed American Arctic Mongol than to the central typical American.

SIR R. MURCHISON ON CRYSTALLINE ROCKS.

Sir WILLIAM LOGAN read a very valuable paper from Sir Roderick Murchison, on the Silurian Rocks in the North of Scotland.

In a letter to Sir William Logan, read before the Association, this distinguished English Geologist says: I beg to communicate to you and any geological contemporaries who may be present, the final determination of a question which has been much agitated in this country, and which has just been settled by a comparison with North American typical fossils, of lower silurian age. This question is:—What is the true place in the geological series of those great masses of crystalline or sub-crystalline stratified rocks, in the North Islands of Scotland, in some of which organic remains were discovered by Mr. Charles Peach, in 1855? That discovery induced me, in the same year, to revisit the localities in the north-west part of Sutherlandshire, to the east of Cape Wrath (Durness), in which the fossils had been detected. The results I arrived at in that excursion, in which I was accompanied by Professor James Nicol, were communicated at the meeting of the British Association at Glasgow, in September, 1855. I then reaffirmed the opinions I had formed in the year 1827, in company with Professor Sedgwick, as to the anteriority of all such quartz rocks, with intercalated limestones, to the old red sandstone or Devonian System; and judging from the facts that such crystalline and sub-crystalline strata reposed unconformably upon an ancient granitoid gneiss, and were flanked and surmounted transgressively by the ichthyolitic deposits of Caithness, I expressed my belief that, although very imperfect and difficult of absolute determination, the fossils there found by Mr. Peach were of lower silurian age. Within these few weeks Mr. C. Peach has found, in the same locality (Durness), other and better preserved fossils, which have, I rejoice to say, set the *questio vacuta* at rest. Mr. Salter unhesitatingly compares these remains with those known to Mr. James Hall, yourself, and other North American Geologists, as occupying the true silurian position of the calciferous sand rocks and base of the Trenton limestones. To the geologists of the Old Country this determination is of the deepest interest, for it gives them a key to unravel the real age of large masses of the quartzites limestones, chloritic and clay slates, mica schists and quasic gneissic rocks (sometimes more, sometimes less metamorphosed) which occupy vast wild tracts of the Highlands of Scotland. He thus concludes:—"The occurrence in the south of Scotland of the *maclurea magna* of Hall, of the *isotelus gigas* derkey in Ireland, and of the fossils of your calciferous sand rocks in our Scottish Highlands, are all most satisfactory proofs that the order in Canada and the country of our kinsmen is, with certain modifications, the same as in the ancient realm of Caractacus.

In the Geological Section papers were also read by Berthold Sieman,

on the Parthenogenesis of Animals and Plants; by T. Sterry Hunt, on the Metamorphism of the Sedimentary Rocks. Professor Chapman made a very favorable impression. His papers were on the classification of minerals, the deposition of plated metals and mechanical agencies, and some experiments in further elucidation of the objects of the salt condition of the sea. Among the other papers read was one on Species of Trilobite from the Potsdam Sandstone of New York, by J. D. Dana.

OBITUARIES OF EX-PRESIDENTS.

In the evening Mr. GOULD read an interesting memoir of Professor J. W. Bailey, who last year had been elected President of the Association, but who had died in February. Professor Olmstead, of Yale College, also read a memoir of W. C. Redfield, the first President, whose fame chiefly rested upon his discoveries of the alleged theory of the rotary movement of storms.

FOURTH DAY.

ARROW-HEAD INSCRIPTIONS.

Rev. J. H. McILVAINE read a paper on Arrow-head or Wedge inscriptions. By far the greater number of these inscriptions were, he said, found scattered over the whole of that vast empire of 127 Provinces or countries, extending from the Indus to the Nile, over which the Ahasuerus of the Book of Esther reigned. From recent discoveries they afford a hope to the Philologist that he will yet be able to decipher the history of those mighty empires which flourished from Nimrod's time to that of Darius. These characters are found inscribed on various objects—on pillars, gems, stone, doorways, and vast marble slabs, eight or ten feet wide and high, with which the chambers had been faced. They were also found inscribed on vast rocks, in their natural positions, smoothed down into tablets, the sides of the everlasting hills being thus inscribed with these imperishable records of a mighty race. By far the greatest amount of these inscriptions is found in Mesopotamia. In one room cylinders covered with this writing were found stored away in such abundance as leads to the supposition that it is the "House of Rolls" similar to that mentioned by Ezra, where the sacred archives were kept. These inscriptions are written characters composed of one sole element, the arrow-head, variously repeated and combined. The combinations of the characters were simplified in the course of ages to form letters accommodated to the different phonetic utterances of the several races holding the supremacy of Western and Central Asia, until we find it in its last and simplest form, on the monuments of the Persian race. These inscriptions when found on the rock tablets are trilingual, and it is remarkable that the three languages of these records are always distributed among the three great families into which modern philology and ethnology have classed all the various branches of the human race. These three languages found on the trilingual tablets may be called the Persian, Babylonian, and Turanian or Tartar. The last was supposed to be the language of the ancient Medes. The Lecturer next proceeded to give an account of the discovery and interpretation of these languages. Their transcription has been wholly within the present century. Professor Grottegend, of Gottingen, made the first discovery, in 1802. He then succeeded in decyphering the names Cyrus, Hystaspes, Darius, and Xerxes. By this a correct determination of at least one-third of the alphabet was obtained. Soon after, Professor Rusk discovered the letters "M" and "N." Then all progress was arrested for some 20 years, and it was not till 1826 that twelve new characters were supplied by Professor Lassen. Some ten years afterwards Eugene Berhuf, a French savant, arrived at several other important results. It is thus apparent that much progress has been made in detached inscriptions by continental scholars before England took any part in the matter; but when at last she did so her achievements were splendid. She sent forth a host of eminent discoverers, including Dr. Hincks, Mr. Norris and Colonel Rawlinson. The discoveries of the latter gentleman have certainly something of the wonderful in them.

UNIVERSAL LANGUAGE.

Prof. WILSON, of Toronto, then read a paper by Professor Hugo Reid, of Halifax, on the subject of the contriving of a universal language. The paper repeated the many arguments which have been often advanced in favor of the adoption by the world of a universal language, which all could understand. He thought for the purpose there were two languages preëminently suitable—the French and English. Of these two the English was perhaps the most suitable, from being at once the most extensively planted throughout the world, and also from having a more simple grammar, natural arrangement of genders, &c.

FOSSILS OF THE ST. LAWRENCE.

Dr. DAWSON, of Montreal, read a paper on the river pliocene fossils of the St. Lawrence. He exhibited a collection of shells found in various localities in the valley. These were mostly littoral shells, and a number of them was found in the Montreal mountain, at an elevation of 470 feet above Lake St. Peter, showing that a shore had