the land is northward. As soon as the border of the ice had receded beyond the watershed dividing the basins of the Minnesota and the Red Rivers, it is evident that a lake, fed by the glacial melting, stood at the foot of the ice-fields, and extended northward as they withdrew along the Red River valley to Lake Winnipeg, filling this valley and its branches to the height of the lowest point over which an outlet could be found. Until the ice-barrier was melted upon the area now crossed by the Nelson River, thereby draining this glacial lake, its outlet was along the present course of the Minnesota River. At first its overflow was upon the nearly level, gently undulating surface of the drift, about 1,100 feet above the sea; but in process of time this cut a channel 125 to 150 feet deep and from one to two miles wide, in which lie Traverse and Big Stone Lakes, respectively 970 and 962 feet above the sea. From this outlet the plain of the Red River valley, 30 to 50 miles wide, stretches 315 miles north to Lake Winnipeg, which is 710 feet above the sea. Along this entire distance there is a very uniform continuous descent of a little less than one foot per mile. The drift deposited by the ice-sheet upon this area, together with that which may have been dropped by floating ice borne on the waters of the lake, and the silt brought in by glacial rivers and by those of the surrounding land, were here received in a lake, shallow near its mouth, but becoming gradually deeper northward.

Beyond our national boundary, Lake Agassiz covered a broad expanse, including the basins of Lake Winnipeg, Red and Rainy Lakes, and the Lake of the Woods. Its breadth varied from 100 to 200 miles, with an extreme length of at least 600 miles and an area, at the time of its greatest extent, exceeding that of Lake Superior.

The most interesting geological features of the basin of this ancient lake now observable are the terraces or beaches formed along its shores at different levels as its outlet was gradually lowered by erosion. These beaches are continuous ridges of sand and gravel, unbroken, save where crossed by modern streams or expanded into the deltas of the ancient lake, whose outlines are thus accurately traced at four distinct levels. The highest or Herman beach is, at the southern end of the lake, 1,045 feet above the sea, or 85 feet above Lake Traverse, and the lowest beach.

Mr. Upham's careful determinations of the altitudes of the beaches have fully established the remarkable fact that the beaches are not level, but have a gradual ascent northward, as compared with the present level line or the surface which a body of water would have now if confined in this valley. The rate of ascent of the highest or Herman beach increases gradually from six inches a mile at Lake Traverse, to above sixteen inches a mile near the national boundary, the total ascent in this distance being 185 feet.

The several beaches are not parallel, the rate of ascent diminishing from the highest to the lowest beach. Thus the second beach is 120 feet, the third 65 feet, and the fourth or lowest 35 feet, higher at the national boundary than at Lake Traverse.

The altitude of the beaches is a function of the longitude as well as the latitude; for a comparison of these beaches in Dakota and Minnesota at the same latitude reveals an ascent from west to east similar to that from south to north, but of less amount, and diminishing in a similar ratio between the successive stages of the lake.

Various causes for these interesting phenomena are suggested and reserved for future discussion; but Mr. Upham indicates his adoption provisionally of the view that the divergence of these ancient shore-lines from the present level line was produced by the gravitation of the water of the lake toward the ice-sheet. At first this attraction would have been relatively large, because of the nearness of the great mass of ice on the north-east in Minnesota and northward in British America; but, as the ice retreated, it must have been gradually diminished, and reduced to a comparatively small influence by the time the ice-sheet had withdrawn so as to permit the northward drainage of the lake.

NOTES AND NEWS.

TWO new methods of determining the density of the earth are being experimented upon at Berlin. The one, by Dr. F. Richarz and Dr. A. König, has been referred to in *Science* (v. 217). These gentlemen apply a sensitive balance with a double pair of scales, one swinging above, the other below, a heavy parallelopipedic mass of lead, which consists of a number of blocks which are exactly measured and weighed. The blocks are perforated, and the wires connecting the upper and lower scales pass through the shaft formed by these perforations. By an ingenious arrangement, the weights, which consist of spheres of lead, can be changed from the upper to the lower scales without opening the case in which the balance is enclosed. The principle on which the experiment is founded is, that, if one of two equal weights is below, the other above, the mass of lead, its attraction will diminish the weight of the former and increase that of the latter. The proportion between this increase and the total weight gives the means for determining the proportion between the attraction and masses of the lead and the earth. Preliminary experiments made with this balance show that a great exactness of the definite measurements may be expected. These experiments are being carried on under the auspices of the Berlin Academy of Sciences in a casemate of Spandau. At the same time J. Wibring is experimenting by another method in the astrophysical observatory at Potsdam. He uses a pendulum made of a brass tube one metre in length and four centimetres in diameter, with spheres of cast iron weighing five hundred and fifty grams at the two ends. A knife-edge of agate six centimetres in length passes through the centre of the tube, and swings on an agate rest. Two small mirrors are attached to the knife-edge, and the oscillations of the pendulum are observed through a telescope. The time of oscillation of the pendulum may be so nicely regulated that oscillations of five minutes length are perfectly regular. Near the iron spheres and opposite to one another, two iron cylinders weighing 325 kilograms are placed, the lower one attracting the lower end of the pendulum to one side, the upper one the upper end to the opposite side. The attraction of these masses affects the oscillations of the pendulum. The result of these observations for the mean density of the earth is 5.594 ± 0.032. The mean of former reliable observations being 5.57, the new figure corresponds well with these. Both experiments will result in a more accurate and trustworthy determination of the mass of the earth.

— In a recent paper on literary catalogues, Mr. Samuel H. Sindeler makes some suggestive remarks about the system of cataloguing now so much in favor. To quote his words, "Paradoxical as it may sound, the very excellence of his [Dewey's] plan is one objection to it. Mr. Dewey multiplies co-operative advantages to those who use his system to such an extent, that if he lives long enough he will make it so much to the advantage of newly forming or growing libraries to use it, that none will be independent enough to modify it. And why should they wish to modify it? Simply because, less than fifty years ago, the present scheme could not have been formed. There was not knowledge enough in the world. There could not now be found, in any scheme then formed, place for a long range of subjects which appear in his actual classification. This is especially true in science, and who shall say that history will not repeat itself in the next fifty years? Let us rather work out the problem of the decimo-mnemonic system on different lines, each library or group of libraries for itself, according to the special needs of the same. Then new Deweys will arise and ply their ingenious arts, and in the millennium the fittest will survive. At present there is danger that the fittest will be handicapped. To give the fittest, when it comes, an earlier chance of survival is one purpose of this paper."

— Cumming's 'Electricity Treated Experimentally,' which was reviewed in the last number of *Science*, is published in America by D. Van Nostrand.

LETTERS TO THE EDITOR.

*** The attention of scientific men is called to the advantages of the correspondence columns of* SCIENCE *for placing promptly on record brief preliminary notices of their investigations. Twenty copies of the number containing his communication will be furnished free to any correspondent on request.*

The editor will be glad to publish any queries consonant with the character of the journal.

Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

Chrome considered as a Poison.

MY attention has been called to an article by Mr. William Glenn of Baltimore in *Science* (x. 58), entitled 'Chrome considered as a Poison,' criticising a paper of mine in the *Boston Medical and Surgical Journal* on the same subject. Were it not that the criticism appears in a scientific journal of high standing, I should