

foot of that part of the Cordilleran mountain series called Sierra de Sandia and bordering exactly the Rio Grande del Norte; just where is situated the town of Albuquerque and the villages of Alameda, Sandia and Bernalillo.

Such erroneous volcanic geography has never been given in a map of the United States even on the most rough sketch.

The group of craters of the Cerrito was first discovered by the present writer in 1853, and recorded as such, on the geological map of New Mexico, 1857, published in Zurich, Switzerland, in *Geology of North America*. They occupy a part of the mesa existing between the southern system of the Cordillera called the Santa Fé Mountains and the northern end of the Sierra de Sandia, nearer to the city of Santa Fé than of Albuquerque, and close to the railroad station called Lamy. The Cerrito lie between Galisteo, Cieneguilla and Lamy. On the sketch map of Mr. Hill, the crater of the old volcano called Cerrito ought to be placed just near the head waters of the Rio Pecos, a little south of the Santa Fé Mountains and northeast of the Sierra de Sandia; and the three black discs of Albuquerque, Sandia and Bernalillo, on the eastern side of the Rio Grande, scratched out.

JULES MARCOU.

GLACIAL STRIÆ.

TO THE EDITOR OF SCIENCE: While strolling over the low hills adjacent to the Delaware river in Northampton county, Pa., I found unmistakable glacial striæ, at least four miles south of the front of the terminal moraine, as commonly defined.

Three parallel scratches, with traces of a fourth, on the sloping side of a shelf of limestone that had just been uncovered from under what seemed a slight bed of true till, and with a direction S. 20 W., made a mistake of judgment, it seems to me, impossible. The repeated occurrence of such ice traces throughout this county to a distance of at least twenty miles south of the moraine most certainly opens for investigation the question of the southern limit of glacial ice.

Yours,

ALBERT G. RAU.

BETHLEHEM, September 15, 1897.

THE ALLEGED EXTINCTION OF LINES OF DESCENT.

PROFESSOR W. K. BROOKS contributed to this JOURNAL some time since (February 1, 1895) an interesting article entitled 'An Inherent Error in the Views of Galton and Weismann on Variation.' The argument of this paper was based on the alleged necessary extinction of lines of descent. Thus Professor Brooks writes:

"Of all the individuals of a species which lived at a given period, very few would have descendants at a later period." "Most of the individuals in each generation must fail to perpetuate their lines to remote descendants." "If a city like Baltimore, where the strangers to each one of us outnumber our acquaintances a thousand fold, could be quarantined against people from outside for a thousand years, each generation would be like the present one so far as known relations are concerned, although at the end of the period the inhabitants would certainly not be descended from the Baltimoreans of our day, but from only a very few of them. Most of our lines would be extinct."

I return to the subject because Professor Brooks' statements carry great weight in a subject important for theories of heredity and evolution, and it seems to me that they contain 'an inherent error.' Family names will become extinct, as shown by Mr. Galton, but not lines of descent that have persisted for several generations. If the present population of Baltimore is to remain stationary, some of the inhabitants having no offspring, the others must on the average have more than two. If, for example, we simplify the problem by supposing one-half of the population to be sterile, and each of those who are fertile to have four offspring who survive to maturity, then only one-sixteenth of the fertile parents would have no descendants in the third generation. Of the balance only one line in 256 would become extinct in the fourth generation, one in 65,536 in the fifth, and one in 4,294,967,296 in the sixth. With families of variable size, etc., the calculations would become intolerably complex; but in any population not decreasing in numbers the descendants of each individual tend to increase in a geometrical ratio and cannot become extinct after several generations. If King Alfred and King Alfred's barber had lines of descent lasting several generations, we are each