

extends for a short distance north of the Churchill River, where it appears to reach its northern limit.

Tamarac (*Larix Americana*) is found growing on the low wet land from the northern edge of the prairie region, northward as far as Lake Athabasca, but its northern limit has not yet been reached.

Cedar (*Thuja occidentalis*) has its general northwestern limit east of Lake Winnipeg, but an isolated colony occurs on the high ridge between Winnipegosis and Cedar lakes, two hundred miles distant from the general limit. No trace of cedar could be found in the intermediate country.

Red Pine (*Pinus resinosa*) also has its general northwestern limit some distance east of Lake Winnipeg, but an outlying grove is said to occur on Black Island, a large sandy island in the lake. Cones collected from trees on this island, and undoubtedly belonging to this species, were sent to the writer by Mr. A. Neison, of Badthroat River.

Scrub Pine (*Pinus banksiana*) grows on the high stony morainic hills on the northeastern portion of Duck Mountain, and on the sandy ridges to the north.

From here it extends northward and northwestward, keeping north of the heavy white spruce forest. It is the principal tree in the rocky and sandy region from the Churchill River northward to Black River, where it grows to a height of from twenty to forty feet, and to a diameter of from eight to twelve inches. On the more level sandy plains it here forms typical pine barrens, the trees being thinly scattered over the surface, while the land beneath them is quite devoid of undergrowth and there is little or no fallen timber, so that the whole country has a park-like aspect. On the rocky slopes it has taken root in the niches and crevices, and is usually stunted and very irregular. It extends north of Black River and Lake Athabasca, and its northern limit has not yet been traced.

THE AFFINITIES OF BASQUE AND BERGER.

BY CANON ISAAC TAYLOR, M. A., LL. D., LITT. D., YORK, ENGLAND.

In the Transactions of the Berlin Academy for June, 1893, Professor Von der Gabelentz has published a paper in which he endeavors to establish a connection between Basque and the languages belonging to the Berber family of speech, such as Kabyle and Tuareg. He admits that the results of his comparison are small, the languages differing in structure of speech, in gender, and in most of the formatives. But he urges that they had certain analogous laws of phonetic change, and that there is a resemblance in a few culture words, mainly the names of animals and of articles of dress. The paper is one of the numerous examples of the way in which pure philologists may be led astray by want of an adequate acquaintance with anthropology. The author bases his attempt on a recent paper in *Ausland* on the craniological resemblance between the Berbères and the ancient Iberians. He then assumes that Basque represents the ancient Iberian speech, whereas Van Eys and Vinson, the two highest authorities, consider that it is impossible to explain such remains as we possess of the ancient Iberian by means of Basque. Broca, moreover, has proved that while the skulls of the Spanish Basques resemble, to some extent, those of the Iberians, the skulls of the French Basques belong to a different type. It is now believed that the race to which the French Basques belong imposed its language on the Spanish Basques, a feebler people of the Iberian type. If this is the case, the results obtained by Von der Gabelentz would be easy of explanation. A conquered people acquiring the language of their conquerors would retain their own phonetic tendencies, and at the same time would incorporate into the acquired language certain classes of words such as those which agree in Basque and Iberian, notably the names of articles of dress and of domesticated

animals. In short, the ancient Iberian may have affected Basque much in the same way that Celtic has affected English and French. It has introduced sundry phonetic tendencies, and some loan words belonging to certain classes. Hence we may still hold fast to the old conclusion that the nearest affinities of Basque are with Accadian and the languages of the Ural-Altaic type.

LETTERS TO THE EDITOR.

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

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

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

THE SO-CALLED SAND OF GREAT SALT LAKE.

THE white deposit which covers Garfield Beach and the adjacent shore of Great Salt Lake, Utah, although commonly called sand, does not consist of true sand. An examination under a low magnifying power, such as that afforded by a common pocket lens, shows that all the particles or grains composing this so-called sand are very smooth and shiny, many being globular, others ovoid, and others dumb-bell and club-like in form. None of them present angular or irregular surfaces, and none have sharp edges or points. When treated with hydrochloric or nitric acid this oölitic "sand" rapidly dissolves with energetic effervescence, leaving but tiny little specks of silicious matter behind, which latter form nuclei in the centre of the oölitic grains. The solution thus obtained contains lime. A very careful scrutiny under high microscopic powers shows the most of each grain to consist of a white, fibrous or somewhat crystallized mineral, with a central enclosed bit of dark gray mineral, that which is left as silicious undissolved matter after the acid treatment aforesaid. In fact I have found a few grains containing nuclei so large that they could be readily seen by the unaided eye. It appears, therefore, that each grain of this deposit is a nodule or concretion, consisting of white crystalline calcite, containing a minute bit of silica or silicious matter as a central nucleus around which the calcite has collected. Some months ago Professor Rompletz reported traces of what he regarded as an alga in oölitic sand from the shores of Great Salt Lake. But Dr. George Jennings Hinde, F. G. S., of London, who has made recent examinations of samples of this oölitic "sand," writes me that he has not discovered any evidence of organic origin in it. In all other respects Dr. Hinde's observations seem to agree with those made by me during the past year.

HENRY MONTGOMERY.

University of Utah, Salt Lake City, July 31.

NATURE'S ROTATION OF CROPS.

An open sandy field which the writer has passed several times a week, for the past ten years, has illustrated well this fact.

No record has been kept, but for the past five years, my recollection is accurate, and for a longer period, I am sure that the "crops" have been of the character stated, though the order of succession may not be strictly correct.

Seven or eight years ago there was a yield of *Eriogonum biennis* which was phenomenal. The following year there was scarcely a plant of this species to be noticed, but a fine crop of mullein succeeded. Daisies followed the mullein, the next year daisies and golden rod (*S. nemoralis*). The year after the solidago took full possession and was a most magnificent crop. The year following but little golden rod could be seen, and very few daisies. Last year was the most magnificent crop of *Hypericum perforatum* I have ever seen. When in blossom, the field was one mass of solid color; it seemed the petals must touch

each other over the whole surface of the entire field. It was a glory not to be forgotten. This year not a plant of the species is visible riding past. Scattered daisies, golden rod (not *S. nemoralis*), a few *Æ. biennis*, and an occasional lespedeza (*L. capitata*) are all that show. The ground is very sparsely covered, whereas last year it was completely occupied, as indeed also by the daisies, the ænothera, and the golden rod in their respective years.

I am satisfied the same thing takes place on other unoccupied sandy fields about here, but I have not watched them as closely nor as regularly as this one. M. W. V.

Fort Edward, N. Y., July 29.

WORMS ON THE BRAIN OF A BIRD.

To judge from Professor French's communication under this title in the current volume of *Science*, p. 20, he is unacquainted with the description and figures of the thread-worm of the snake bird given by Prof. Jeffries Wyman, in 1868, in the Proceedings of the Boston Society of Natural History, Vol. 12, p. 100.

SAMUEL H. SCUDDER.

A SPACE-RELATION OF NUMBERS.

THE recent notes and discussions as to certain curious relations observed by some persons between sensations of color and of sound,—relations hardly conceivable by others who, like myself, have never experienced them,—have led me to reflect upon a peculiar conception of my own, which may be called a space-relation of numbers. I have never heard it alluded to by any one; but it has been constant with me since childhood, and seems so peculiar and inexplicable that it may be worthy of mention and inquiry. It is presented, therefore, in the hope that the experience of others may throw some light upon it as a mental phenomenon, and help to show whether it be a mere idiosyncrasy or an experience at all known, and, if the latter, how far familiar, and with what, if any, modifications.

My first distinct recollection of this idea goes back to the age of nine or ten years, in connection with learning the multiplication table. This I was taught, not at school, but by home instruction, and without any use of cards, tables, slates, abaci, or any visible signs or aids whatever. It was purely abstract and *memoriter*. Somehow, then, and ever since, the numbers from 1 to 100 have been conceived of by me as holding, relatively, definite positions in space, from which they never vary,—the mention or use of the number being at once associated with its position relative to other numbers, in the same way that the mention of a well-known country or river brings up a mental picture of its geographical location.

This numerical position has no relation with that of any other object or thing, nor with the position of the body or the points of the compass. In describing it, however, I must employ the latter, but simply as aids, in place of a diagram. The numbers, which are conceived of merely as points or stations in space, appear to be arranged in a peculiar line or lines in a horizontal plane. Beginning with unity, the series runs in a straight line to 20, where it turns ninety degrees to the right, and so goes to 30. Using the points of the compass merely for the present description, as above stated, and not from any connection with the number-scheme itself,—if the series 1-20 runs (say) northward, 20-30 runs always east, 20 being the apex of the right angle. From 30 to 40 the course is *reversed* and runs back westward; at 40 it again turns at a right angle and proceeds south, without interruption, to 90, where the line again turns east from 90 to 100. Above this point, the numbers have the same positions again, and so in each succeeding hundred; so that the same description applies to all.

It will be seen by any one who attempts to put this scheme on paper, that, according to the arrangement, the numbers 30 to 40 would coincide, in reverse order, with 20-30, 40 falling upon the same spot as 20; while 40-60 would coincide with 1-20, in reverse order. But in the mental conception this is not the case. The line 30-40 seems parallel to 20-30, but at some little distance; and a vague sense of space, gradually increasing until no distinct relation is consciously noted, prevents any approach or interference between the numbers above 40 and those below 20. This fact confirms the impression that the idea is not due to any artificial aid in the way of diagram, table, or the like, in childhood.

The only suggestion that occurs is found in the fact that about that period the family had lived for some time in a large hotel (the Delavan, at Albany), whose corridors and numbered rooms may have impressed themselves on the child-mind in some such way. But I distinctly recall that certain of those rooms, occupied at different times by the family, did not at all have the positions that their numbers hold in this mental scheme.

Be this as it may, however, the clearness and the persistence of this association are remarkable, and I should be greatly interested to know if others can report any similar experience. If certain chords in music can suggest the sensation of purple, or the sound of a word a corresponding impression of blue, etc., as apparently is the case with some persons, why may not certain abstract numbers have similar associations of space-position?

D. S. MARTIN.

New York, Aug. 3.

PRELIMINARY NOTE ON THE COTTONY SCALE OF THE OSAGE ORANGE.

IN June I found a Cottony Scale (*Pulvinaria*) in some abundance on an osage-orange tree (*maclura*) in Las Cruces, N. Mex. The young were hatching on and about June 14th. This scale would be referred by modern entomologists to *Pulvinaria innumerabilis* (Rathvon) Putnam, but finding that it did not agree very well with published accounts of that species, I sent to Professor Bruner for specimens of the true insect, which abounds at Lincoln, Neb. Professor Bruner very kindly forwarded without delay a number of examples from box-elder, which were evidently not quite the same as my osage-orange scale.

The box-elder scale, however, agrees with *innumerabilis*, while the *maclura* scale is what was formerly named *macluræ*, and afterwards sunk as a synonym of *innumerabilis*.

The most conspicuous and constant difference is in the size. In order to show this, I boiled the adult females (which had formed ovisacs) in caustic soda, and spread their skins flat on a glass slide. Thus treated, the measurements were as follows:

P. macluræ (Las Cruces) . . length 10, breadth 10 mm.

P. innumerabilis (Lincoln) . . “ 7½, “ 5 “

It is thus seen that *macluræ* is both larger and broader in proportion; and no intermediate specimens were found. Another difference is in the length of the fourth joint of the antenna: in the Las Cruces *macluræ* it is about as long as the third joint, whereas in the Lincoln *innumerabilis* it is decidedly shorter than the third. I have not yet examined enough specimens to make sure if this character is invariable. I do not wish to assert positively that *L. macluræ* is a valid species, but its characters are such as have been held to distinguish species of *Pulvinaria* in Europe. I hope to set the matter at rest hereafter by the examination of more extensive material, but it must be admitted at least that it is a very distinct race or variety. In this we revert to the original opinion of Fitch, Walsh and Riley (1855, 1860, 1868), which has been set aside for so many years.