current, and that this decrease becomes greater as the frequency becomes higher. There is a marked analogy between this phenomenon and the decrease in the magnetic permeability in an alternating magnetic field as the frequency is increased, a fact which has been recently established by Niethammer and M. Wien.

WM. H. HOBBS.

DISCUSSION AND CORRESPONDENCE.

GEOLOGICAL TIME.

EDITOR OF SCIENCE: Sir Archibald Geikie's recent forcible plea to working geologists for the more careful accumulation of data which may yield reliable estimates of geological time, makes the interesting suggestion given in SCIENCE, October 27th, by Professor Wilbur C. Knight, under the title of 'Some New Data for Converting Geological Time Into Years,' seem very timely. The opportunities for making such calculations of the rate of retreat of cliffs under the action of subærial decay, by employing slow-growing trees on the escarpments as a chronometer, are far wider spread than at first thought might seem likely.

In justice to the maiden work of a now eminent American geologist, it is proper to recall the fact that the first suggestion of this method and its first practical application were made by Dr. G. K. Gilbert, in 1866, when temporarily connected with the staff of the New York State Museum. After the excavation of the mastodon skeleton now standing in the State Museum, from a glacial pot hole in the valley of the Mohawk river at Cohoes, N. Y., Mr. Gilbert gave attention to an estimate of the rate of retreat of the cliffs of the river gorge, basing his observations on the degree to which the roots of the red cedars on the banks had been exposed by the falling away of the rock face. Mr. Gilbert's observations and deductions were published in the 21st annual report on the New York State Cabinet of Natural History (1871), and I quote from them the following paragraph: "Climbing from below or lowered by a rope from above, I have examined nearly all these trees and measured in each case the circumference of trunk and length of exposed root. I have also counted the rings of annual accretion of several sections to ascertain the relation of size to age. From these data an idea may be obtained of the rate of recession of the cliff. The growth is exceedingly slow. A branch of one and one-eighth inch in diameter showed 100 rings of growth, and an average of six such branches gave 72 years per inch of diameter. The figures used below were obtained from two sections of trunks. One of these measures 19½ inches in circumference and exhibits 310 rings; the other gave 11 inches and 270 rings. In these an inch of circumference represents 19.1 years, and an inch of diameter, 60 years."

He then gives a tabulation of results derived from 19 of these ancient gnarled cedars and by dividing the average measured length of exposed root by the average estimated age of the tree, arrives at the figure 15.2 inches as the rate of retreat of the rock face per century. This figure for other considerations he reduced to 12 inches per century and upon this calculation bases his final statement: "This gives as the time necessary to have removed the banks below the fall [Cohoes] from the deep channel to their present position, 35,000 years, which period I consider a minimum for the time that has elapsed since Cohoes falls were opposite the mastodon pot hole."

Twenty years ago the writer applied the same method to a calculation of the rate of retreat of the shale escarpments along Canandaigua Lake, N. Y., where these ancient cedars were at that time abundant, and had the satisfaction of arriving at a conclusion very like that obtained by Mr. Gilbert. Just where the weakness in such calculations may lie is not at once evident unless there be one in admitting the *annual* value of the growth rings in the tree. Mr. Gilbert's method, now revived by Professor Knight, merits renewed and general application. Employed with caution and care to exclude diverse agencies of retreat, it ought to afford eventually, important conclusions.

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NEWSPAPER SCIENCE.

TO THE EDITOR OF SCIENCE: So much has been published far and wide this last summer about my intention 'to scientifically demon-

strate the immortality of the soul within a year,' that it is due to the facts bearing upon the choice between materialism and spiritism to say that I have never made any such professions as have been alleged. I wish to make this statement, because I shall leave no excuse in my report of my facts for judging of them from that point of view. Whether they have any value or not I do not care to say, as I am not the person to urge that view of them. I merely wish the scientific public that still has the bad habit of reading and believing the newspapers to know that I was careful to deny that I made any such pretensions as were so generally attributed to me. More than one-half the interviews alleged to have been held with me were the fabrications of reporters who never saw me, and the other half omitted what I did say and published what I did not say. There would be no reason to make this correction at all except that the wide currency given to a pretension that I never entertained creates a standard by which I am far from estimating the facts myself, and much less can I expect others to treat it with respect. It is true that I have reversed my preferences in the choice between spiritism and materialism on account of ten years study of the Piper case, but I have done so on grounds that must force respect, even when they do not produce conviction; and the only object I had in facing public scorn was to make it as respectable to study these phenomena as it is to investigate insanity and other abnormal facts. There is a perfectly inexcusable cowardice in the attitude of scientific men toward the claims of spiritualism, and they are treated with a contempt which men would be ashamed to exhibit toward the phenomena of insanity. Hence having a body of facts for which I can safely demand consideration on some theory, I have only thrown down the gauntlet to those who have not accepted telepathy and simply ask that they turn the balance in favor of that hypothesis, instead of the spiritistic for which I have merely declared a preference, but which I should be the first to surrender, if science establishes a preference for the infinite in a woman's skull. But what I shall have to report must not be estimated as an attempt to demonstrate anything even to myself, to say nothing of those who have neither studied the subject nor taken the pains to question the authority of respectability.

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NOTES ON ORGANIC CHEMISTRY.

In the usual methods of quantitative analysis by electrolysis, the cathode is usually a platinum cone or cylinder, giving greater current on the exterior than in the interior, and an unequal deposition of the metallic deposit. In Oettel's improvement a platinum plate is used as cathode, with a fork-shaped anode, one arm on each side of the cathode. This is only partially successful in overcoming the difficulties, the deposit tending especially to scale off. In the *Berichte*, Clemens Winkler suggests the use of platinum gauze as a kathode. The metal is deposited very regularly even with strong current. It is in the form of a cylinder around each thread of gauze, is compact, firmly deposited, and shows no tendency to scale off, even at very considerable current strength. The time required is only about one-fourth as great as with the old form of electrode. Many solutions are therefore available which could not otherwise be used, as, for example, copper is readily deposited in large quantities from its sulfate solution.

In the last number of the *Bulletin* of the French Chemical Society, Weisberg gives a large series of experiments as to the power of aqueous solutions of sugar to dissolve lime. The amount which can be thus dissolved is about 27 grams of lime per 100 grams of dissolved sugar. In solution with very little sugar the relative amount of lime taken up is larger than this, but the absolute amount is of course small. Previous observations are confirmed that lime in its anhydrous form, CaO, is more soluble in sugar solutions than is its form of calcium hydroxide or milk of lime.

Some time since the use of calcium carbid as a reducing substance for high temperatures was suggested by Warren. This subject has now been worked up by Tarrugi in the *Gazetta*, and he finds most metallic salts are decomposed