

ber 17, Professor T. C. Chamberlin, of the University of Chicago, gave an address entitled, 'Some Further Studies as to the Early States of the Earth.' The nebular hypothesis of the origin of the earth, as stated by Laplace, was discussed, and a brief summary made of certain tests to which the theory had been put by Professor Chamberlin and others, as described by Professor Chamberlin in various publications. It was concluded that the Laplacean hypothesis will not stand fundamental tests and that some modification of the hypothesis or some new hypothesis is necessary.

Professor Chamberlin's researches have furnished criteria for a new hypothesis of the origin of the earth. The parent body out of which the solar system was evolved must have been one which possessed limited matter; a very small proportion of matter near the exterior with very high energy of movement; in the central portion very low energy of movement, and with the conditions in the central portion permitting the development of a spherical body as the controlling center.

The earth in its early history may be conceived to have been a small body, growing gradually by the infall of material from without, without, in the early stages, an atmosphere, because of its incompetency to hold one. The atmosphere, instead of being the dominant phenomenon at the beginning of the earth, was practically absent from the exterior of the earth until it was $\frac{1}{10}$ or more grown. Gradually the accretion of the atmosphere permitted the gathering of water vapor, and this by condensation at length formed the oceans. These thenceforth protected the infalling matter of that portion of the earth, for matter falling into water does not undergo as ready decomposition as that which falls upon the surface. This process going on from age to age gave to certain areas a higher specific gravity than other portions. We therefore have an explanation of the superior gravity of the portion of the earth lying under these beds of water as compared with the land, and thus, perhaps, of the great depth of ocean basins.

It is obvious that from a very early stage volcanic action must have arisen from the ex-

cessive heat generated in the interior through self-compression of the mass, as may be shown by mathematical calculation. The volcanic action would affect certain substances before others, and the selection thus made from the time of its inauguration, when the earth was perhaps not more than $\frac{1}{80}$ or $\frac{1}{100}$ grown, is sufficient to explain the present distribution of volcanic matter.

Another phase of the history of the earth may be traced in this way: If the temperature of the interior is sufficiently accounted for by compression, the temperature developed by the infall of matter may have been made available for the sustenance of life at a very early period. Therefore we escape the objections raised by geologists against the prolonged era of evolution insisted upon by biologists.

C. K. LEITH.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of the Academy of Science of St. Louis on the evening of January 20, Dr. George Richter delivered an address on the physical and chemical properties of gelatin, which he described as a spongy substance differing materially from other solids. The manner of manufacture of gelatin and its chemical and physical characters were described in detail, and considerable attention was given to the rate of absorption and evaporation of water by gelatin, and the phenomenon of its apparent solution in water. A new hygrometer was exhibited and described, the action of which was based upon the water absorption of gelatin.

At the meeting on February 3, Mr. Trelease presented, with the aid of lantern illustrations, some of the principal results of his recent studies of Yuccas and their allies.

WILLIAM TRELEASE,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

WIRELESS TELEGRAPHY.

TO THE EDITOR OF SCIENCE: I wish to enter formal protest against the statement concerning Wireless Telegraphy, on page 112, etc., of the issue of SCIENCE for January 17.

In anything that I may say let it be understood that I am not personal to Professor Franklin, who brings the editorial from London *Electrician* to our attention. The readers of SCIENCE need no statement from me as to Professor Franklin's qualifications.

It is too much the habit of scientists to be conservative about the application of scientific theory to commercial use. It seems to be an attitude which it is impossible to avoid; and the limitations of the individual are usually regarded as those of the science. For this reason I protest against the conclusions so hastily drawn in the present immature stage of the art of Wireless Telegraphy, viz., that it is practically incapable of any substantial extension. In this connection I quote from the *Scientific American* Supplement, the issue of August 5, 1882, page 5490, from an article called 'Electro-Mania' by W. M. Williams.

I well remember making this journey to Boxmoor (upon one of the early steam railway carriages on the London and Northwestern Railway), and four or five years later travelling on a circular electro-magnetic railway. Comparing that electric railway with those now exhibiting, and comparing the Boxmoor trip with the present work of the London and Northwestern Railway, I have no hesitation in affirming that the rate of progress in electro-locomotion during the last forty years has been far smaller than that of steam. The leading fallacy which is urging the electro-maniacs of the present time to their ruinous investments is the idea that electro-motors are novelties, and that electric lighting is in its infancy; while gas lighting is regarded as an old, or mature middle-aged business, and, therefore, we are to expect a marvelous growth of the infant and no further progress of the adult.

This quotation is a type. Further, application of scientific theory to the affairs of man has from time immemorial been met by the scoffs not only of the ignorant (which may be borne with equanimity), but of those who ought to know better. The article by Mr. Williams was written after the birth of the dynamo, and he was doubtless incapable of distinguishing then between the old galvanic battery electric railways and those which followed the development of mechanical electric contrivances. We now know that the electric

railway, so lightly characterized then, is an every-day matter involving the use of more capital than all other electric contrivances combined. The capital liabilities of the electric railways in the United States alone amount to \$2,000,000,000; the telegraphs of the United States amount to \$175,000,000, and the telephone systems of all kinds to a little less than \$250,000,000.

Further, I protest that the entire article in the London *Electrician* is of the most unscientific character, utterly unworthy the attention of any one who tries to preserve fair-mindedness; and again that it misrepresents facts in the baldest manner; take such an example as this:

The wireless channel of transmission will be rigorously avoided by business men, to whom a guarantee of secrecy and the certainty of a recorded message are absolutely indispensable. Wireless signals in the ether can never be secret; it must always be possible to intercept them. And messages received in no more permanent form than by sounds in a telephone are too evanescent and uncertain to commend themselves to the purposes of commerce.

And this in spite of the fact that the most enormous transactions are undertaken and consummated by telephone!

Ipse dixit predictions of this kind are unscientific. The scientist who has learned to distinguish between 'It can't be done' and 'I can't do it' has learned something which the evanescent gentleman who penned the article brought to our attention has certainly neglected. A caution against undue haste or boldness of prediction is all right; but predictions of what cannot be done are all wrong, and very much further wrong, because they neglect all the teachings of the past, and instead of adopting a Baconian philosophy would render it impossible for scientific men to obtain the means of pursuing investigations.

T. J. JOHNSTON.

SHORTER ARTICLES.

THE DISCOVERY OF TORREJON MAMMALS IN MONTANA.

LAST spring (1901), after it was decided that an expedition should be sent from Princeton