structure of the region where the copper occurs in northern Texas and the Indian Territory. He had received specimens from that region long ago and recognized their similarity to the copper ores of New Mexico, where in the upper portion of the Triassic formation copper forming concretions and replacing wood occur in many localities, and have been more or less mined for. In one locality near Abiquini very extensive galleries have been cut in the sandstone in search of copper which there replaces branches and trunks of trees and forms concretions which are irregularly scattered through the rock. Here the work was done by the early Spanish explorers perhaps 200 years ago, and the remains of the furnaces in which the copper was smelted are still to be seen at the mouth of the mine. Still further west, in southern Utah, the same formation carries copper and considerable silver, at Silver Reef enough to pay well for mining, but in no locality yet known are the deposits of copper ore sufficiently concentrated and continuous to make mining for that material profitable, so it would doubtless be found in Texas and the Indian Territory. The copper was deposited with the Triassic rocks from a shallow sea in which an unusual quantity of copper was held in solution. This impregnated the sediments found at the bottom replacing wood and forming as nodules about some nucleus. The aggregate quantity of copper in this formation was enormous, but, except where by the erosion of the beds it accumulated at the surface and could be picked up without any expense in mining, it would hardly pay to attempt to obtain it by ordinary mining processes.

The wood replaced by copper Dr. Newberry said was undoubtedly all coniferous, and different from any now living. The beds which contained the cuprified wood also contained much that was silicified. Of this he had examined many specimens under the microscope and had found the peculiar dotted cells which are characteristic of the coniferæ, and these grouped in such a way as to prove the trees to have belonged to the Araucarian group of conifers. So far as yet known the angiosperms, or higher order of plants, did not make their appearance on the earth's surface until after the copper bearing rocks of the southwest had been deposited.

THE AMERICAN CHEMICAL SOCIETY.

The November meeting of this Society was held on Friday evening, November 4th, with Vice-President Leeds in the Chair.

The following gentlemen were duly elected members: Dr. C. W. Volney, Dr. Witthaus, Messrs. C. E. Munsell, W. W. Share, J. D. O'Connor, and Day. The first paper of the evening was "On some New Salts of Thymole Sulphoacid, and some new facts concerning the same," (a second paper) by Mr. J. H. Stebbins, Jr., S. B. The sodium salt having the formula

$$C_6H_2\,(CH_3)\,(C_3H_7)\,(NaSO_3)\,O\,Na+2\tfrac{1}{2}H_2O$$

was described, and also the free sulphur salt had its characteristics enumerated.

Mr. Stebbins followed with a second paper "On the Combination of Diazo Compounds with Thymole Sulpho-Acid."

In this he described the experiments which he performed in his work, the results of which were given in the first paper. Both were technical and not of any popular interest.

The third paper was by Dr. C. W. Volney, and was entitled, "The Constitution of the Explosive Derivatives of Glycerine."

In this communication the author tried to prove that the nitro-glycerine was composed by the substitution of the nitrogen trioxide (NO_3) instead of the nitrous oxide NO_2, making the formula $C_3H_5\,(NO_3)_3$ instead of $C_3H_5\,(NO_2)\,O_3$, and secondly, he showed how it was possible to substitute chlorine for the nitrogen trioxide and so produce a new explosive compound.

This paper provoked much discussion on account of the theoretical arrangement of the atoms necessary to sustain Dr. Volney's statement.

Subsequently the Committee on Nominations reported that the following ticket was recommended to the Society for their votes at the December meeting.

Corresponding Secretary.— P. Casamajor.
Recording Secretary.—J. H. Stebbins, Jr.
Treasurer.— M. Alsberg.
Librarian.—Geo. A. Prochazka.
Curators.—A. J. Rossi, Wm. Rupp, A. A. Fesquet.
Committee on Publications.—Arno Behr, A. R. Ledoux, H. Endemann.
Committee on Nominations.—A. H. Elliott, O. H. Krause, J. P. Battershall, J. B. F. Herrishoff, T. O'C. Sloane.
Board of Directors.—P. Casamajor, J. H, Stebbins, Jr., H. Morton, C. F. Chandler, M. Alsberg, E. R. Squibb, W. H. Nichols, W. H. Habershaw, E. Waller, A. H. Gallatin, Geo, A. Prochazka.

ON THE NATURE OF THE DIPHTHERITIC CONTAGIUM.

By Dr. H. C. Wood.

The lecturer began by stating that the researches which formed the basis of the present address had been made under the auspices, and, indeed, at the suggestion, of the National Board of Health, by Dr. Henry F. Formad and himself, who were jointly responsible for the facts and inductions and jointly deserving of whatever reprobation or approbation might be due. The full text of the work is now in the hands of the National Board, and will be shortly published by them as an appendix to their annual report, and the lecturer desired that criticism be withheld until this was done, as the memoir will contain much that cannot be spoken of in the present lecture.

In the spring of 1880 work was begun by inoculating rabbits with diphtheritic membrane taken from the throats of patients at Philadelphia. An account of the labors of the following summer has been already published, but it seems necessary to epitomize them here. It was found that only in a very few cases was anything like diphtheria produced in the rabbit by inoculating with the membrane. The inoculations were practised by putting pieces of the material sometimes under the skin, sometimes deep in the muscles. Many rabbits died after some weeks, not of diphtheria, but of tuberculosis. In a series of experiments it was shown that this tuberculosis was an indirect and not a direct result of the inoculation, and that any apparent relation between the two diseases is only apparent, not real. Next, the tracheas of a series of rabbits were opened and false membrane inserted. It was found that under these circumstances a severe trachitis was frequently produced, and was attended by an abundant formation of pseudo-membrane. Careful studies made of the false membrane of diphtheria and of this false membrane showed that the two were identical, both containing in abundance fibrin fibres, corpuscular elements, and various forms of micrococci. To determine whether other inflammations of the trachea than that caused by diphtheria or its membrane are accompanied by the formation of false membrane, a number of experiments were made, and it was demonstrated that the production of false membrane has nothing specific in it, but that any trachitis of sufficient severity is accompanied by this product. Careful studies also showed that this false membrane does not differ in its constitution from that of true diphtheria, except it be that the micrococci are not so abundant in it. We always found some micrococci, and in some of these traumatic pseudo-mem-

*AN ADDRESS MADE BEFORE THE ACADEMY OF NATURAL SCIENCES.