Conard fissure. *Rangifer* is stated by Osborn on page 86 as not appearing in the mid-Pleistocene, but on page 87 as coming in late. According to Shaler, *R. tarandus* seems to have been abundant in the older deposits of Big Bone Lick and a species of caribou has been found at Muscatine, Iowa. The late mid-Pleistocene age of the part of the loess containing the *Rangifer* bones is yet to be proved. *Ursus* is a third genus said by Professor Osborn to be a late comer in glacial times. One or two species of the genus were reported from Port Kennedy cave. Two species of the genus, one not distinguishable by Dr. Leidy from the common black bear, were found near Natchez, Miss., in the loess. Shimek, who has made a special study of the loess at Natchez,[8] says that "the solid blue clay," in which the vertebrates of that section have been found, probably does not belong to the loess, but is older still. How old it is no one knows.

According to the table cited above, the two species of mammoth, *Elephas columbi* and *E. primigenius,* disappeared during the mid-Pleistocene, while the mastodon perished during the "upper mid-Pleistocene." Now, northwestern Ohio, northern Indiana and southern Michigan are deeply covered over by a thick mantle of drift materials that was deposited by the Late Wisconsin ice sheet, the very last of the glacial advances. In depressions left on the surface after the retreat of this sheet there were formed lakes and ponds that afterwards became more or less completely filled up, forming marshes, peat bogs and swales. In ditching such places there have frequently been found the teeth and bones, sometimes nearly complete skeletons of the two elephants and of the mastodon. The fine specimen of *E. columbi,* now in the American Museum at New York and described by Professor Osborn, was found in just such a situation. It would be very difficult to prove that the mastodon survived the mammoth. It is certain that both the elephants and the mastodon continued to inhabit the Mississippi Valley long after the glaciers had abandoned the region and therefore during at least a part, if not the whole, of the Postglacial stage of the Pleistocene.

OLIVER P. HAY

[8] *Bull. Lab. Nat. Hist.*, Iowa Univ., V., p. 307.

CATALYTIC ACTION OF IRON SALTS

GIBBS[1] has shown that the red coloration of phenol is due to oxidation brought about by the catalytic action of sunlight. The oxidation products condense and form red substances, as for example, phenoquinone.

As Dr. Fenton has shown that oxygen and sunlight are equivalent to hydrogen peroxide and a trace of a ferrous salt in their oxidizing action upon organic compounds, it struck me that the catalytic action of iron might be studied colorimetrically by resource of Gibb's work.

A concentrated solution of phenol in benzene was divided into three equal parts. The first was exposed to sunlight for two days, the second was treated with a small quantity of hydrogen peroxide, and to the third were added a trace of ferrous sulphate, and then the same quantity of hydrogen peroxide as was added in the second case.

No change could be seen in the first, the second almost immediately developed a very slight pink coloration, but the third at once changed to a reddish-brown color.

Blank experiments were made to show that the color was not due to benzene. Again, in order to prove that the color was not due to the iron alone, traces of a ferrous and a ferric salt were added to a similar benzene solution (without the hydrogen peroxide) when a greenish color was produced, which in no way could be associated with the reddish-brown color caused by iron and peroxide.

Further experiments showed that by means of the above reagents many of the laws of catalysis could be actually demonstrated to a large class in a lecture. More especially because the action was rapid and could be followed by the production of color. For example, to prove in a rough manner that catalysis can not affect the final equilibrium, the two differently colored solutions (one containing traces of iron and the other not)

[1] *Philipp. J. Sci.*, 1909, 4, 133.

are stood aside for a time, when it will be seen that they have both acquired exactly the same color, although the acquisition of it was more rapid in the solution which contained the trace of ferrous sulphate.

Lastly, it has been suggested that the iron merely brings about the catalytic decomposition of the peroxide (if such is the case, as Dr. Fenton has pointed out, why should not other salts produce the same effects?), and this suggestion seems at first sight to be confirmed by the fact that when the solution containing no iron is warmed (thereby bringing about the thermal decomposition of the peroxide, the result of which is just the same as that of "catalytic" decomposition) the color is developed with the same velocity as in the case of the cold solution containing traces of ferrous sulphate.

W. J. S. Naunton

THE CONVOCATION WEEK MEETINGS OF SCIENTIFIC SOCIETIES

The American Association for the Advancement of Science and the national scientific societies named below will meet at Boston, Mass., during convocation week, beginning on December 27, 1909.

American Association for the Advancement of Science.—Retiring president, Professor T. C. Chamberlin, University of Chicago; president, Dr. David Starr Jordan, of Stanford University; permanent secretary, Dr. L. O. Howard, Cosmos Club, Washington, D. C.; general secretary, Professor Dayton C. Miller, Case School of Applied Science, Cleveland, Ohio.

Local Executive Committee.—H. W. Tyler, chairman; Thomas Barbour, J. S. Kingsley, Edward R. Warren, John Warren, George W. Swett, secretary.

Section A, Mathematics and Astronomy.—Vice-president, Professor Ernest W. Brown, Yale University; secretary, Professor G. A. Miller, University of Illinois, Urbana, Illinois.

Section B, Physics.—Vice-president, Dr. Louis A. Bauer, Carnegie Institution, Washington, D. C.; secretary, Professor A. D. Cole, Vassar College, Poughkeepsie, N. Y.

Section C, Chemistry.—Vice-president, Professor William McPherson, Ohio State University; secretary, C. H. Herty, University of North Carolina, Chapel Hill, N. C.

Section D, Mechanical Science and Engineering.—Vice-president, Professor John F. Hayford, Northwestern University; secretary, G. W. Bissell, Michigan Agricultural College, East Lansing, Mich.

Section E, Geology and Geography.—Vice-president, Reginald W. Brock, Canadian Geological Survey; secretary, F. P. Gulliver, Norwich, Conn.

Section F, Zoology.—Vice-president, Professor William E. Ritter, La Jolla, Cal.; secretary, Professor Morris A. Bigelow, Columbia University, New York City.

Section G, Botany.—Vice-president, Professor David Penhallow, McGill University; secretary, Professor H. C. Cowles, University of Chicago, Chicago, Ill.

Section H, Anthropology.—Vice-president, Dr. W. H. Holmes, Bureau of American Ethnology; secretary, Dr. George Grant MacCurdy, Yale University, New Haven, Conn.

Section I, Social and Economic Science.—Vice-president, Byron W. Holt, 54 Broad St., New York City; secretary, Dr. John Franklin Crowell, 44 Broad St., New York City.

Section K, Physiology and Experimental Medicine.—Vice-president, Professor C. S. Minot, Harvard Medical School; secretary, Dr. Wm. J. Gies, College of Physicians and Surgeons, Columbia University, New York City.

Section L, Education.—Vice-president, Dean James E. Russell, Columbia University; secretary, Professor C. R. Mann, University of Chicago, Chicago, Ill.

The American Society of Naturalists.—December 29. President, Professor T. H. Morgan, Columbia University; secretary, Dr. H. McE. Knower, University of Toronto, Toronto, Can. *Central Branch.* President, Professor R. A. Harper, University of Wisconsin; secretary, Professor Thomas G. Lee, University of Minnesota, Minneapolis, Minn.

The American Mathematical Society.—December 28–30. President, Professor Maxime Bôcher, Harvard University; secretary, Professor F. N. Cole, 501 West 116th St., New York City.

American Federation of Teachers of the Mathematical and Natural Sciences.—December 27, 28. President, Professor H. W. Tyler, Massachusetts Institute of Technology; secretary, Professor C. R. Mann, University of Chicago, Chicago, Ill.

The American Physical Society.—President, Professor Henry Crew, Northwestern University; secretary, Professor Ernest Merritt, Cornell University, Ithaca, N. Y.