concentration is effected by making the ore magnetic by roasting in a suitable furnace in contact with producer gas, then after crushing to small size passing it over a magnetic separator, when the silica is thrown off and the iron ore remains to fall into a bin. The experiments have been carried far enough to demonstrate the fact that concentration may be carried out which will make available the stratum of ore hitherto thrown aside as too high in silica for profitable working. The carrying out of this process on a commercial scale would mean a great deal for the Birmingham district.

The subject set for discussion at this meeting was the utilization of the by-products of the coking ovens, and on this Mr. A. J. Montgomery read a paper of much interest. The next meeting of the Society will be held in the autumn.

Eugene A. Smith,
Secretary.

ST. LOUIS ACADEMY OF SCIENCE.

The Academy held its regular meeting on June 17th, with President Green in the chair and 25 members and visitors present.

Dr. C. R. Sanger spoke of the Chemistry of Photography, dividing his discourse into the following headings: (1) The Formation of the Latent Image. (2) The Development of the Latent Image. (3) The Fixation of the Developed Image. (4) The Printing of the Positive. (5) The Toning of the Positive.

Adjourned until the third Monday in October.

A. W. Douglas,
Recording Secretary.

SCIENTIFIC JOURNALS.

THE AMERICAN JOURNAL OF SCIENCE.

The July number of the *American Journal of Science* commences the fiftieth and closing volume of the *third* series; it is the one hundred and fiftieth volume since the Journal was established in 1818. The opening article is by Frank Leverett, on the Correlation of New York moraines with raised beachs of Lake Erie. The investigation here detailed is in continuation of the work earlier done by the same author (the results published in 1892) in tracing the connection between the raised beaches of the western portion of the Erie basin and certain moraines in Ohio. It is a department in which G. K. Gilbert had also made extensive investigations previous to this time, notably in 1886. The names given to the successive beaches are those suggested by Mr. Gilbert, viz., the upper or Sheridan Beach, traced by Gilbert from Cleveland eastward to Sheridan, N. Y., which may be a continuation of the western Belmore Beach and the lower Crittenden Beach, especially investigated to the eastward near Hamburg. A map is given by Leverett, of the region under discussion, showing the position of the beaches and the moraines and other related features exhaustively treated in this article. The author reaches some important conclusions, which, however, hardly admit of brief statement; one point made relates to the successive outlets of the lake during the glacial times. A paper by H. L. Wells describes, as a continuation of former work in a similar subject, two remarkable chemical compounds containing lead and extra iodine. These are Johnson's salt for which the formula $5Pb(CH_3CO_2)_2.3KI.6I$ or perhaps $5Pb(CH_3CO_2)_2.3KI_3$ is deduced and Gröger's salt with the formula $PbI_2.PbO.3I.H_2O$.

Two papers on analytical chemistry come from the laboratory of F. A. Gooch, the first embodying the results of work by himself and Charlotte Fairbanks in the estimation of the halogens in mixed silver salts, and the second with C. F. Clemons on the determination of selenious acid by potassium permanganate. S. F. Peckham, in a paper upon the Pitch lake of Trinidad, de-

tails the results of a visit to that remarkable spot in the spring of 1895. In this connection he gives an interesting review of early descriptions of the same region, commencing with that of Anderson in 1789, also Nugent in 1807, Alexander in 1832, Manross in 1855 and others later. The paper is accompanied by several sketch maps which give definiteness to the description. J. C. Merriam describes some reptilian remains from the Triassic of northern California, of much interest in view of the fact that the Mesozoic of California has thus far yielded so little in this direction. The remains studied represent two individuals from the black Triassic limestone of Shasta county. The first, consisting of eight vertebræ, some fragments of ribs and both coracords, receives the same *Shastasaurus pacificus*. In the second, the remains consisted of some twenty-five vertebræ, mostly anterior caudals; these resemble those of Ichthyosaurus, but in certain particulars, as in an ungrooved single-headed rib, it agrees rather with the new genus established, Shastasaurus. The material, however, was insufficient for specific characterization. The concluding article of the number is a discussion by Frank D. Adams, of the Laurentian of Canada, accompanied by two plates. The region, the study of which has yielded the results here concisely presented, is shown in Plate I. It lies to the north and west of Montreal and the St. Lawrence river, and is largely occupied by the crystalline schists of the Grenville Series with subordinate masses of the "Fundamental Gneiss" and a number of anorthosite intrusions. The stratigraphy and petrography are both discussed, and the latter is supplemented by a series of analyses of typical gneisses and slates. The author concludes that in the district under consideration there are "at least two distinct sets of foliated rocks. One of these, comprising limestone, quartzites and certain garnetiferous or sillimanite gneisses, represents in all probability highly altered and extremely ancient sediments. The other set intimately associated with these are of igneous origin, and comprise numerous and very extensive intrusions, both acid and basic in character, which were probably injected at widely separated times." * * * * "The Grenville Series therefore comprises certain primeval sediments which have been deeply buried, invaded by great masses of igneous rocks and re-crystallized. They may, perhaps, in some cases have been mingled with these igneous masses by actual fusion. The whole complex has also been subjected to great dynamic movements. In this way has resulted a series of rocks whose original character cannot in all cases be deciphered, but which can be recognized as being of composite origin, the sedimentary portion representing extremely old, if not the oldest, sediments with which we are acquainted."

AMERICAN CHEMICAL JOURNAL.

THE number for June contains a number of short contributions from various laboratories, and several reports. Gomberg contributes an article on the action of inorganic cyanides on chlorocaffeine. He found that when chlorocaffeine was treated with potassium cyanide he obtained neither the cyancaffeine nor the amidocaffeine, as he expected, but caffeine carboxylamide. The cyancaffeine is produced in the reaction, but only as an intermediate product, being converted, by saponification, into caffeine carboxylamide. The reaction can be represented thus:

$$C_5(CH_3)_3ClN_4O_2+KCN=C_5(CH_3)_3(CN)N_4O_2+KCl$$
$$C_5(CH_3)_3(CN)N_4O_2+H_2O=C_5(CH_3)_3(CONH_2)N_4O_2$$

By the action of phosphorus pentachloride on this compound one molecule of water is removed and cyanocaffeine is formed.

$$C_8H_9(CONH_2)N_4O_2—H_2O=C_8H_9(CN)N_4O_2$$

This was found to be the best method for the formation of cyanocaffeine, for all at-

tempts to replace the chlorine by the cyanogen group by treatment with potassium cyanide under various conditions were only partially successful. The acid amide was converted into caffeine carboxylic acid and a number of salts were prepared and studied. All the compounds could be explained by the accepted structure for caffeine.

Shober and Kiefer describe the results of a series of experiments on the decomposition of metadiazobenzene sulphonic acid. They find that this acid when boiled with methyl, ethyl and prophyl alcohols, at different pressures, gives both the methoxy and hydrogen reaction, while the corresponding para compound gives only the hydrogen reaction. Kastle and Keiser have a paper on the colorimetric determination of the affinity of acids by means of potassium dichromate. The reaction depends upon the fact that when a solution of potassium dichromate is treated with a solution of sodium acetate or the sodium salt of other acids, the base is equally distributed and the normal chromates are formed. They used as a standard a solution of potassium dichromate to which a solution of tenth-normal sodium hydroxide was added until an equal color was obtained. They could determine the amount of decomposition and, assuming the affinity of potassium dichromate as 1, could calculate the relative affinities of the acids. For many of the acids the results agree fairly well with those obtained by Ostwald; but for some acids the method could not be used. Mixter gives the methods of preparation and properties of some azo and azimido compounds, and Noyes contributes another article on camphoric acid. He finds that in the formation of campholytic acid, from di-hydroamino-campholytic acid, by the action of nitrous acid, another acid is formed, whose reactions, along with other facts, furnish strong proof that the carboxyl groups of camphoric acid are combined with adjacent carbon atoms. He considers the two isomeric campholytic acids to be stereoisomeric.

An article by Wheeler contains a description of benzimidomethyl ether and its action on aromatic ortho compounds. No new compounds were obtained, as the reactions took place differently from what he expected.

Curtiss has repeated some of Nef's work on the action of ethyl iodide on silver acetylacetone

$$\begin{matrix} CH_3.\,CO\,Ag \\ HC.\,COCH_3 \end{matrix}$$

and explains the formation of two products by the assumption that the molecule has two points about equally susceptible of attack, namely, the silver atom and the double bond between the two carbon atoms. The ethyl, therefore, replaces the silver directly, or the ethyl iodide is added to the doubly bound carbonatom. He has also shown that Claisen's objection to Nef's statement, that oxymethylene compounds and acetacetic ether, in the free state, show close analogy, does not hold, as he has obtained an ester by the action of dry hydrochloric acid gas on acetacetic ether in alcohol. Randall contributes a report of articles by Ramsay on 'The molecular complexity of liquids.' This number also contains obituary notices of James A. Dana, Lothar Meyer and Gerhard Krüss.

J. Elliott Gilpin.

NEW BOOKS.

Fingerprint Directories. Francis Galton. London and New York, Macmillan & Co. 1895. Pp. 123. $2.00.

Annual Report of the Department of Health of the City of Chicago. Arthur R. Reynolds. Chicago. 1895. Pp. lix+268.

A Text Book of Physiology. M. Foster. New York and London, Macmillan & Co. 1895. Pp. xlviii+1183. $5.00.