

from solution, and there is nothing to indicate that the nuggets have undergone either igneous or hydrothermal fusion.

It is not often that there is an opportunity to determine the changes in a well water extending over a long period of years, but this has been done by W. W. Fisher in the case of the water of the Trafalgar Square well. He prints in a recent number of the *Analyst* an analysis just made of this water, comparing it with analyses made in 1848 and in 1857. These analyses show that the character of the water has not changed essentially, although the quantity of potassium salts has diminished quite decidedly. In this connection the author calls attention to the fact that alkaline waters are drawn not only from the chalk under the London clay, but also from other deep limestones, and draws the conclusion that the alkali salts present come from the chalk itself and not from percolation. In covered deposits where no natural drainage is possible, the chalk is found to contain soluble salts, distinct traces of sodium carbonate, chlorid and sulfate being found in chalk beneath London at a depth of 500 and 800 feet.

J. L. H.

RECENT ZOOPALEONTOLOGY.

FRITSCH'S 'FAUNA DER GASKOHLLE UND DER KALKSTEINE DER PERMFORMATION, BÖMENS.'

DR. ANTOINE FRITSCH, of Prag, has recently issued a complete list of his publications extending back to the year 1851 and covering essentially the broad field of his zoological and paleontological observations. His most monumental work is on the primitive fishes, amphibians and reptiles of the Permian period described in a series of monographs under the title cited above, beginning in the year 1880.

The first monograph covers the long-bodied stegocephalian amphibians of the order Aistopoda; this was continued with the description of the short-bodied forms resembling the modern perennibranchiates in 1884. More advanced labyrinthodonts were described in 1885, the amphibian division of the fauna being concluded in 1887.

The second volume is mainly devoted to the lung fishes, or Dipnoi, and to the more primitive types of selachians. Most important of these types is the genus *Pleuracanthus* which bridges over the gap in fin-structure between the American genus *Cladoselache*, as described by Newberry and Dean, and the fin of the modern shark. This transition form completely disestablished the archipteryial theory of Gegenbaur and established the fin-fold theory of Thacher and Balfour. The other primitive selachians were concluded in 1893, and the great modern actinopterygian types corresponding to Agassiz's ganoids were covered in the parts which appeared during the succeeding two years.

The fourth volume, of which three parts have appeared between 1899 and the present time, is devoted to the insects of the Permian period, especially the myriopods and arachnoids. Finally, this monographic series is brought to a close in 1901 by the third part of the fourth volume which covers the crustaceans and molluscs. This series of monographs will constitute the greatest monument to its author. Also, those who visit Prag find there to their surprise that this Bohemian city contains one of the most beautiful zoological museums in the world, developed under the direction of this veteran zoologist.

H. F. O.

GRAVITY ON THE OCEAN.

THE proceedings of the Academy of Sciences of Berlin of February 13, 1902, contain a paper by Professor F. R. Helmert on Dr. Hecker's determination of gravity on the Atlantic Ocean. In July and August, 1901, the International Geodetic Association entrusted Dr. Hecker, of the Potsdam Geodetic Institute, with the duty of making relative gravity observations on the Atlantic Ocean on a voyage between Hamburg and Bahia. The method employed was to determine the pressure of the atmosphere by means of a barometer and a hypsometer (boiling point thermometer). The barometric formula contains a term depending on the intensity of gravity at the place where the observation was made. The hypsometer is independent of this influ-