Carboniferous times (p. 95), and that the Karroo strata of Katanga and Rhodesia were formed in the lowered areas. The "graben" of the great lake region is of much younger age. H. S. Harger, in his presidential address (vol. xvi., p. xxii.), points out that the Drakensberg lavas are of Jurassic age, and probably extended at one time right across the Free State. He is concerned with the immense amount of subsequent denudation, but does not explain how the "vast peneplain" over the entire Karroo (p. xxviii.) came about, if the surface remained high above sea-level. A great inland lake might, of course, supply a base-level. He contrasts the periods of great river-action with those of subsequent desiccation, and gives striking illustrations of denudation by sand-storms in German South-West Africa. May we ask that this energetic society should consider those members who cannot promptly bind the Transactions? They have a way of falling to pieces when one cuts the pages which renders them very liable to denudation.

F. Oswald, well known for his researches in Armenia, has described "The Miocene Beds of the Victoria Nyanza and the Geology of the Country between the Lake and the Kisii Highlands" (Quart. Journ. Geol. Soc. London, vol. lxx., 1914, p. 128). His journey through a fly-infested region was undertaken to collect vertebrate remains from lacustrine strata, which underlie extensive flows of nepheline-basalt. C. W. Andrews describes the mammalia, including Dinotherium and two anthracotheres, and R. Bullen Newton shows that the associated freshwater mollusca represent existing species. The mammalia, however, assign the deposits, which were formed probably in a delta, to the Burdigalian epoch, and the history of the Victoria Nyanza is thus carried back into the middle of Cainozoic time.

R. B. Newton enters the African field in another paper (Records of the Albany Museum, Grahamstown, vol. ii., 1913, p. 315), in which he shows that the extensive Alexandria formation of the Cape Province is of Cainozoic age, and distinct from the Cretaceous strata occurring near East London. Several new molluscan species are represented in a beautiful series of photographic plates.

A. E. V. Zealley ("Zinc and Lead Deposits of Broken Hill, N. Rhodesia," South African Journ. Sci., vol. viii., 1912, p. 396), remarks that the phosphates in this area, including the beautiful deposits of hopeite, are connected with the decomposition of a bone-breccia, and that vanadinite arises in connection with the zinc and lead phosphates in a way which suggests that vanadium occurs also in the bones.

THE INSTITUTE OF METALS.

IN the study of the constitution of alloys, as well as in the practical and commercial use of both pure metals and alloys, that form of heat treatment known as annealing plays an important part, and a complete knowledge of the effects of various temperatures and conditions of annealing is of vital importance. This statement is not invalidated by the fact that many of our large metal works conduct their annealing operations in the most crude and haphazard way, a state of affairs which is, happily, becoming a thing of the past. In this connection it is interesting to note that one-third of the papers read at the recent meeting of the Institute of Metals deal, to a greater or less extent, with this important subject. J. Phelps shows that the presence of hydrogen in the atmosphere surrounding silver which is being annealed, increases the temperature required to obtain complete softness in thirty minutes, from below 150° C. to about 300° C. F. Johnson emphasises the necessity of annealing Admiralty brass castings to a temperature of about 700° C. Bengough and Hanson show that copper tested to destruction in an oxidising atmosphere has an elongation four times as great, and a maximum stress one-third as great, as that obtained when the test is carried out in a neutral atmosphere such as carbon dioxide.

Bengough and Hanson's paper also contains much interesting information as to the tensile properties of copper at high temperatures. They show that this metal fits in very well, on the whole, with Rosenhain's amorphous theory, the fracture changing from a ductile, crystalline one at low temperatures, to a non-ductile, intercrystalline, and very brittle one at high temperatures. A remarkable difference, however, is that Rosenhain and Ewen found that the intercrystalline fracture occurred within a few degrees of the melting point, whereas the present workers have found that, in the case of copper, it is evident as low as 720° C., or about 350° C. below the melting point.

From time immemorial, manufacturers of zinc-copper alloys have known that, at temperatures somewhat below a red heat, 60/40 brass becomes very brittle, recovering its normal strength as it cools. This fact was referred to by Bengough and Hudson in a paper read to the Institute of Metals in September, 1910. At the next meeting Carpenter and Edwards showed that there was an arrest point occurring at about 470° C. in the heating and cooling curves of this alloy. They pointed out that this could be explained by assuming either (1) that there was a polymorphic modification of the β constituent at this temperature, or (2) that the β splits up into $\alpha+\gamma$. On microscopic and other grounds they accepted the latter view. In the discussion which followed the reading of the paper, Mr. Hudson, amongst others, confessed himself unable to accept Prof. Carpenter's interpretation. Since then the fray has raged more or less continuously between the supporters of the two theories, and at this meeting. a paper has been read by Mr. Hudson, which, in the opinion of the writer, definitely settles the question in favour of the polymorphic theory. Briefly, the β constituent has been synthetised from α and γ at temperatures below 470° C., *i.e.* at a temperature at which the "decomposition theory" supposes that it does not exist in equilibrium. This result was obtained by annealing a piece of 70/30 brass in contact with a piece of zinc at a temperature ranging between 420° C. and 430° C.; after annealing for several days, a section was cut at right angles to the junction of the two metals, and it was found that β was present.

The third part of Arnold Phillip's "Contribution to the History of Corrosion" consists in a refutation of the statement (made by Bengough and Jones in their "Report to the Corrosion Committee") that coke in condenser tubes does not promote corrosion. He brings forward evidence to prove that the reverse is the case.

Thorneycroft and Turner continue the work commenced some years ago by Prof. Turner on the volatility of metals *in vacuo*. The present paper describes the results of experiments on the zinc-copper series, and the authors show that those alloys containing more than 40 per cent. of copper can be quantitatively separated into their constituent metals by distillation *in vacuo*, while in the case of those which contain less than 40 per cent., part of the copper comes over with the zinc.

Amongst other papers read at the meeting is an interesting one by Captain Belaiew, which has been reprinted already in NATURE (p. 107), a description of the Schoop process of spraying metals by R. K. Morcom, and a paper by S. W. Smith on the surface tension of molten metals. J. L. H.