

exists at the present time, particularly as regards such terms as "brass" and "bronze." A system of nomenclature was put forward in which alloys are classified according to the system of binary alloys to which they approximate most closely, and class names for such binary systems were advocated.

Prof. T. Turner dealt with the behaviour of certain alloys when heated *in vacuo*. It was observed, a year ago, that on melting brass *in vacuo* the whole of the zinc volatilises, leaving the copper. This separation is quantitative if the heating is not too prolonged and the temperature not above 1200° C. The behaviour of other copper-zinc alloys was therefore investigated. A sample of "poisoned" brass—*i.e.* brass containing iron, lead, tin, arsenic, and other impurities—was heated *in vacuo* at 1200° C., and the residue examined. All the zinc, lead, and arsenic, and a little of the tin, volatilised, leaving a residue of copper, iron, and most of the tin. It is suggested that heating *in vacuo* might be advantageously applied for the refining of crude copper, brass scrap, &c. "Hard" zinc may be refined by heating *in vacuo* to 500° C., *i.e.* to a scarcely visible red heat. Zinc distils readily in glass vessels *in vacuo*, the vapour being colourless and transparent. The zinc condenses in globules, having the appearance of mercury.

Prof. H. C. H. Carpenter described further experiments on the critical point at 470° C. in copper-zinc alloys. The so-called β constituent in copper-zinc alloys is to be regarded below 470° C. as a minute and uniform complex of α and γ particles. Even after six weeks annealing at 445° C. no coalescence of the particles has been observed in an alloy of exactly the eutectoid composition. When, however, a few crystallites either of α or γ are initially present in an otherwise pure eutectoid alloy, then, on annealing at 445° C., this stability is easily destroyed. The structural stability of the pure eutectoid alloy can be explained by supposing that, at the inversion temperature on cooling, the resolution of β into α plus γ takes place throughout the entire alloy almost, if not quite, simultaneously.

Mr. F. Johnson, in his paper on the effect of tin and lead on the micro-structure of brass, records the results of experiments made with the object of ascertaining the structural relations which exist between lead and tin when present in brass where the ratio of copper to zinc is 2 : 1. He strongly advocates a very thorough annealing of all cast material of the 70/29/1 and 62/37/1 compositions (Admiralty and Naval brass respectively) before subjecting it to rolling or drawing.

OXFORD METEOROLOGICAL OBSERVATIONS.¹

WE are glad to see the appearance of the volume referred to below, containing as it does the meteorological observations made at the Radcliffe Observatory, Oxford, for the years 1900 to 1905 inclusive, because there has been difficulty in obtaining the necessary funds for printing. Fortunately the Radcliffe Trustees, by means of a grant of a special character, have been able to overcome this difficulty; and not only will the arrears of printing be made good, but, as the director remarks, "we hope before many months are past to be able to clear those off and in future to publish the results of our meteorological observations promptly in a regular annual form." This is really good news, because meteorologists—and there are now many of them—who discuss meteorological observations desire to include the most recent data, and in a great number of cases these are impossible owing to the values not being published. The meteorological observations made at the Radcliffe Observatory, some of which date from the year 1850, form a most valuable, continuous, and homogeneous series, so that it is most important that this series should be published as soon as possible. Even now the present volume goes only so far as the year 1905, so that the observations for the years 1906 to 1911 are still missing in a published form.

In recent years attention has been directed to the peculiar

¹ "Results of Meteorological Observations made at the Radcliffe Observatory, Oxford, in the Six Years 1900-5." Under the direction of Dr. A. A. Rambaut, F.R.S. Vol. xlix. Pp. xx+304. (Oxford: Henry Frowde; London: Oxford University Press, 1911.)

position the Radcliffe observations hold with regard to the large question of the Thames flow. It was found by Sir Norman and Dr. Lockyer that the rainfall at Oxford represented variations from year to year which corresponded closely with the variations determined from a large number of combined stations, and these corresponded in nearly every feature with the variations of the level of the Thames as recorded at the numerous gauges on the river. This fact showed that by simply taking the Oxford rainfall records alone a good approximation to the subsequent flow of the Thames could be gathered, because the natural flow of the Thames has a lag of four to five months on the rainfall. It is noticed in this report that weekly values of rainfall are communicated directly to the Thames Conservancy Board, no doubt in consequence of this relationship.

The volume is arranged on the same lines as that previously issued for the period 1892 to 1899, with the following important differences:—First, that the readings of the fine underground platinum thermometers, which were commenced in the year 1898 (October), and continued daily throughout the six years dealt with in this volume, have been omitted, as it is intended to publish them later in a separate form, with a full discussion of the results; secondly, that the tabulated daily results and monthly means derived from the photographic and self-recording instruments have been included; thirdly and lastly, that the results of the hourly readings of the barograph, thermograph, and hygrograph have also been incorporated in the volume, with a discussion of the mean diurnal inequalities in the readings of the three instruments for the period under consideration, and a comparison of these inequalities with similar quantities deduced for the period 1880 to 1887.

AMERICAN ARCHÆOLOGICAL PROBLEMS.

MR. ALFRED P. MAUDSLAY delivered his presidential address at the annual general meeting of the Royal Anthropological Institute on Tuesday, January 23. Mr. Maudslay said that even at the present day the idea that the origin of man does not form a fit subject for scientific inquiry has not yet entirely died out, and this feeling has militated against anthropology becoming a popular study. Meanwhile, the immediate and energetic prosecution of anthropological studies is of vital necessity, since the material with which this science deals is becoming rarer every year, as primitive customs yield to civilisation. The fact that man's physique is less subject to alteration gives a permanent value to the study of physical anthropology. An example of the far-reaching effects of a change in culture is, let us say, the introduction of writing, which has a democratic tendency, since it places the tribal law, formerly preserved in the memories of the elders, at the disposal of the younger members of the tribe. Upon the present occasion attention may be confined to certain points of the archaeology of America, where there are traces of many extinct civilisations. The word civilisation is used for want of a better; such a people as the Aztecs, though civilised in some respects, were barbarous, or even savage, in others. In fact, our terminology requires revision, for the existence of a savage custom, such as cannibalism, does not necessarily imply a low stage of culture. Want of recognition of this fact has caused many misunderstandings between Europeans and the "barbarous" races. Such misunderstandings might be avoided by a knowledge of elementary anthropology, and this institute has not ceased to press upon the Government the advisability of establishing in this country an Anthropological Bureau, which would be of material assistance to colonial administration.

There is no better test of the antiquity of American culture than the fact that maize and other vegetable foods had been gradually evolved by patient cultivation from obscure wild plants. The indigenous nature of that culture is shown by the fact that they were unknown in other continents before the discovery, though their value to man led to their introduction all over the world immediately afterwards. The languages of America, moreover, bear a closer resemblance to one another than to those of the rest of the world.

In solving the many problems presented by America,