anyone interfering with it is smitten with sickness. In this ceremony a mirror was held to receive the first glance (*belma*) of the image while the eyes were being painted.

An account of the teaching of drawing as practised at the present day serves as an introduction to a consideration of the *motifs* employed in Sinhalese decorative art. Although there is an immense amount of new material in this section, it may be doubted whether it would not have been rendered more valuable to all, as it certainly would have been to the anthropologist, if greater attention had been paid to the history of the evolution of the individual elements of decoration; for instance, the *makara*, which bulks so largely in Sinhalese art, and which occurs on the Barahat Stupa, *circa* 200 B.C., is dismissed in rather less than half a page of print, while the *hamsa* fares even worse. These and many other conventional elements were most skilfully combined, and the beauty of the results attained is seen in plate xvi. (here reproduced in Fig. 1), of a nineteenth-century ceiling painting from the Dalada Maligawá, Kandy, representing a forest scene.

FIG. 2.—Guardian Deity from a Temple Door Jamb, Ivory. Height of plaque, 10⅝ inches. Colombo Museum Collection. From "Mediæval Sinhalese Art."

There are chapters on architecture, woodwork, stonework, figure sculpture, and painting, the reduced colour plates of some of the wall paintings in Degaldoruwa Vihara, Kandy, being extraordinarily faithful reproductions of the originals, the spirit of which they have preserved to a surprising degree.

An interesting conjecture is made in chapter x., which suggests that ivory was comparatively little used in Indian art on account of the Hindu reluctance to use the products of dead animals; Buddhists had no scruples of this sort, and so ivory was always valued and used in Ceylon even in temples, with the result that ivory carvings are perhaps the most beautiful and pleasing fruit of the Sinhalese art impulse, rivalled only by some of the superb inlay metal work still existing on the temple doors. Fig. 2 represents an ivory carving in the Colombo Museum of a guardian deity from the jamb of a temple door.

In the last two chapters Dr. Coomaraswamy shows that, in the present stage of our knowledge, it is only possible to indicate the main sources which have influenced Sinhalese art. The most widely exerted influence in Indian art is that due to the Asokan Buddhist missions, the culture which these dispersed being early Indian; thus Sinhalese art is largely the result of the evolution of an early Indian art, in part sheltered by the geographical position of Ceylon from that Hinduism which overwhelmed it upon the mainland. But in post-Asokan and mediæval times this art was continually exposed to Indian influence; "indeed, until the close of the period of mediæval conditions, the relations between Southern India and Ceylon were similar to those obtaining in the Middle Ages between France and England." This leads to the suggestion that the famous rock paintings at Sigiri, the like of which are found only at Ajanta, are due to a school, representatives of which were to be found both in India and Ceylon. The fine bronzes recently found by Mr. H. C. P. Bell at Polonnarua and now in the Colombo Museum, though of a later date, point in the same direction, for the whole feeling of these is Hindu. To sum up, Dr. Coomaraswamy sees in Sinhalese art "an early stratum of indispensable barbaric decorative motives, . . . then a main stream of North Indian Buddhist influence; and thereafter the influence of continued reliance upon and intercourse with India, especially Southern India, accounting at every period for the strong admixture of purely Hindu with Buddhist *motifs*." With this conclusion few will quarrel, though Dr. Coomaraswamy says all too little concerning the earliest stratum. It remains only to direct attention to the number and excellence of the photographs by Mrs. Coomaraswamy, and to indicate that it is owing to her energy that the remains of the moribund art of Sinhalese embroidery have been brought together to form chapter xv. C. G. S.

A DISCUSSION OF AUSTRALIAN METEOROLOGY.[1]

THE meteorology of the southern hemisphere presents a specially attractive field of study. The large area of water surface conduces to much simpler conditions than are to be found to the north of the Equator, and here, if anywhere, the meteorologist may hope to discover the fundamental principles underlying the general movements of the atmosphere. On the other hand, he has to face the relative paucity of data. The meteorological organisations of the three great land areas are still young, and our knowledge of what is happening over the sea is woefully small as compared with the completeness with which we are able to track down changes occurring over the great trade routes of the North Atlantic. The present discussion forms a recapitulation and a completion of work published from time to time from the Solar Physics Observatory, of which abstracts have appeared in previous numbers of NATURE (lxx., p. 177; lxxiv., p. 352). At the outset we congratulate Dr. Lockyer on his success in bringing together a vast amount of information and on the skill with which he has marshalled the facts deduced therefrom.

[1] Solar Physics Committee. A Discussion of Australian Meteorology, by Dr. W. J. S. Lockyer, under the direction of Sir Norman Lockyer, K.C.B., F.R.S. Pp. vii+117; 10 plates. (London: Wyman and Sons, Ltd., 1909.)

The opening chapters deal exclusively with Australian conditions. Pressure observations are considered first. The mean amplitude of the difference between a number of conspicuous minima and the succeeding maxima in the curves showing the annual variation, amounts to more than seven-hundredths of an inch. When the curves for those stations for which long records are available are compared, they all show a marked similarity, and the important generalisation is arrived at that simultaneous excess or defect of pressure in any one year is a marked feature of the whole Australian continent, and is not restricted to any one particular portion of this area. Coming next to the rainfall observations, an examination of the curves leads to a similar conclusion. Years of low rainfall are, broadly speaking, years of deficiency over the whole continent, and in years of excess the excess is also general. Moreover, a comparison of the rainfall and pressure curves suggests very strongly that periods of high pressure are periods of low rainfall, and *vice versa*. These are generalisations of great importance, for they introduce a great simplification, and correspondingly facilitate the further study of Australian weather conditions. In view of the few data available in proportion to the area considered, a meteorologist, arguing from analogy, might be disposed to regard these as hasty generalisations. The extraordinary variability of rainfall in other parts of the world is well known, and for its adequate study a large mass of information is essential. When the necessary figures are forthcoming we find that even within the narrow limits of our own islands there are very conspicuous differences between the north of Scotland and the south of England. Australian conditions are, however, different. As Dr. Lockyer points out, the weather of the continent is dominated primarily by anticyclones travelling from west to east. In years of high pressure these anticyclones are found to embrace a wider area, and thus the low-pressure systems which skirt their edges and bring rain to the northern districts in summer, and to the southern ones in winter, affect the land area to a smaller extent.

In discussing these questions of correlation, whether it be between variations of the same element at different places or between different elements, Dr. Lockyer uses the similarity between two curves as his standard of measurement. The points of resemblance to which he directs attention are, indeed, striking. At the same time, the reader feels a desire for a more definite expression of the relation between the elements under comparison. When we come to the correlation between the Australian curves and those for other parts of the world, which takes up much of the later part of the work, this becomes more imperative. Thus, on p. 72, after discussing the striking resemblance between the pressure changes at Adelaide and those of Bombay or Batavia, we read, "While the Cordoba curve is nearly the inverse of Adelaide the curve for the Cape seems to be intermediate, being more inclined to be similar to the Australian type of variation than that of South America." The intermediate between two curves which are inverse to one another should be a straight line. If it is meant that the Cape curve follows now the variations of Adelaide and now those of Cordoba, it becomes a matter of importance to have some means of comparing the degrees of similarity in the two cases. Superpose any two arbitrarily drawn curves showing fluctuations of approximately the same amplitude, and we are sure to find that some of the maxima and minima agree. Can we say by how much the correlation between the curves we are discussing exceeds that between curves drawn arbitrarily?

The question of periodicity naturally comes in for discussion. After eliminating a variation of short period by taking means of groups of four years, Dr. Lockyer claims that the smoothed curves for Australia show a periodicity of nineteen years. It is true that there are conspicuous maxima in 1868 and 1897, and minima separated by about the same number of years, but this does not of itself prove a recurring periodicity, and the case is not advanced by drawing a "hypothetical" curve through the points of maximum in which an intervening secondary maximum is disregarded and replaced by a principal minimum. The occurrence of a similar interval between the maxima in the pressure curve for South America, but of other epoch, is suggestive, but the question of the connection between the two continents remains one for further study.

A highly suggestive and interesting chapter on the air movements over the three great land areas of the southern hemisphere points out some interesting similarities between the pressure distribution and the incidence of rainfall of the three continents. The volume also contains an interesting comparison of the flow of the Murray river with the rainfall, and of the frequency of southerly "Bursters" with the variations of pressure. The work thus ranges over a wide field. It offers much that is new, and brings together from a common point of view much information that has hitherto been scattered in a number of individual papers. R. G. K. L.

POSSIBILITY OF AN EXTRA-NEPTUNIAN PLANET.

M. GAILLOT has contributed an admirable note on this subject to the *Comptes rendus* (March 22). A summary of his calculations is set forth so clearly as to be easy to follow, and if we have one regret it is that he has not published the discordances between observed and tabular positions that necessarily form the basis of his work. We suppose that the *Comptes rendus* do not admit masses of tabular matter, and we wish to express the hope that M. Gaillot will publish this information somehow or other.

A review recently appeared in NATURE (June 17, p. 463) on Prof. W. H. Pickering's calculations. We there maintained that Prof. Pickering's supposed planet "O" could not possibly produce sensible perturbations in Uranus. Now, M. Gaillot and Prof. Pickering both locate their hypothetical planets in the same part of the sky. M. Gaillot's mass is five times that of the earth, or two and a half times that of Prof. Pickering's "O." A reader of the previous review will see that M. Gaillot's planet would, therefore, produce in Uranus inequalities exceeding a second of arc. We suspect that Prof. Pickering has made some numerical mistake in estimating the mass of his planet "O," and, if he can rectify this, we should then have two independent researches in practical agreement. M. Gaillot's result is, however, sufficiently confirmed by the analogy from inner planets developed in the previous review.

The important question now arises, "Are the observed discordances sufficiently large to point unmistakably to some unknown planet?" It is clear that an inequality with a coefficient of one second of arc appears to exist in the observations; but the elliptic constants of the orbit of Uranus are arbitrary, the observations are liable to small errors, and the theory of the action of known planets is not perfect. All this shows how unsafe it would be to assert the real existence of the inequality which would in its turn demonstrate the existence of an unknown planet. We