

amination of only a few common pigments, and by no means exhaustively even with these; about some vehicles and diluents the information to be found in these pages is less meagre.

There are five chapters in this book, an appendix containing thirteen tables, and an adequate index. Chapter i. is devoted to the determination of certain constituents of common paints, and deals with aluminium, barium, carbon dioxide, chromium, iron, lead, magnesium, manganese, silicon, sulphur, and zinc. In this chapter, which occupies only fourteen pages, we are struck with the inadequate, and even puerile, drawing of the CO₂ apparatus shown in the figure on p. 3, and with the confused nomenclature of the two oxides of chromium. For example, on pp. 4 and 5 we are told that "all chromate compounds must be changed into the chromic state which is indicated by an intense green color," and that this "green color is due to chromic salts." The omission of any caution as to the non-volatile impurities commonly occurring in the hydrofluoric solution used in ascertaining the purity of silica is unfortunate.

The properties of a few common pigments, such as Prussian blue, ultramarine, ivory-black, umber, Vandyke brown, the mixture of lead chromate and Prussian blue wrongly called chrome green, iron-red, genuine and imitative vermilion, a number of white pigments or adulterants, chrome yellow, red lead, yellow ochre, and the siennas are dealt with. This list serves to show how many of the finer and choicer pigments, namely, aureolin, cadmium yellow, viridian, and cobalt-blue, are excluded from consideration. Nor can we agree with everything we find in these pages. Ivory- and bone-black are not "combinations of carbon, hydrocarbons, water and mineral matter." Graphite does not possess a "brownish gray" colour; and there are many words wrongly spelt in this chapter, such as analine for aniline, and limionite for limonite.

The examination of actual paints, and of such as are mixed ready for use, is dealt with in the third chapter. The preliminary treatment of oil-paints necessary before they can be tested or analysed is duly described. Chapter iv. is concerned with the matching of samples, while the final chapter is devoted to vehicles. Here will be found a more adequate, detailed treatment of the subject. On pp. 89-92, for instance, the curious drying oil called Chinese wood oil is described. This oil is used largely both in China and Japan, and is imported into America and Europe in increasing quantities. It is obtained from the seeds of *Aleurites Fordii* (Hemsley) and of other species of the same genus, as *A. cordata* and *A. trisperma*. Mr. C. H. Hall states (*loc. cit.*) that this oil, if heated to 285° C. to 300° C., suddenly solidifies into a jelly which is no longer soluble in the usual solvents, and cannot be reduced again to the liquid state. Mr. Hall's statement that Chinese wood oil, even in small proportion, confers upon paints the property of drying without gloss, and may be used as a substitute for wax in painting media intended to produce a dull or matt surface, seems to merit particular attention.

The thirteen tables of constants, coefficients, and specific gravities which constitute the appendix to this volume will be found useful by the analyst. There is a full index.

This little book, with all its imperfections and its immaturity, is not destitute of merit.

OUR BOOK SHELF.

British Rainfall, 1905. (Forty-fifth annual volume.)
By Dr. Hugh Robert Mill. Pp. 271. (London: Edward Stanford, 1906.) Price 10s.

THE forty-fifth issue of this annual volume tells us better than any mere description could do of the healthy and active state of this voluntary rainfall organisation. When it is considered that more than 4000 individuals scattered over the British Isles read their rain-gauges at 9 o'clock every morning, enter their results on a form, and send in monthly returns to the central bureau at 62 Camden Square, and do all this voluntarily, it is impossible not to admire this band of enthusiasts for their united efforts in so good a cause.

The valuable collection of rainfall statistics is not, however, allowed to lie idle, for the energetic head of this organisation, Dr. H. R. Mill, with his small staff, brings all the facts together, and discusses the distribution of this rainfall both in space and time.

The present volume shows how well this work is carried out, and the observers must feel a great amount of satisfaction in seeing their united efforts so ably handled. Fronting p. 64 is a map indicating the positions of the 4096 rain-gauges at present in use, and one can see at a glance the districts where observers are urgently needed. Ireland and north and central Scotland are conspicuously in need of more volunteers, and it is hoped that many of the places mentioned in the text will soon be counted among the recording stations.

As meteorological readers of NATURE are fully acquainted with the general arrangement of the matter in these annual volumes, it is only necessary in this notice to direct attention to some of the discussions on the collected statistics. Thus, after a brief review of the recent important publication on the "Precipitation in the North German River Basins," compiled by Prof. Hellmann, we are presented with some valuable data on the relation of evaporation from a water surface to other meteorological phenomena. The section on heavy falls on rainfall days in 1905 will be found very interesting reading, and the numerous maps show at a glance the distribution of these falls over the country. After sections dealing with the distribution of rainfall in time, and a discussion of monthly rainfall, we come to the relation of the total fall of rain in 1905 to the average. To sum up in a few words the result of this discussion, it may be said that for the whole of England and Wales the general rainfall for 1905 was 16 per cent. below the average. In fact, so low was this figure that "except for 1902 and 1893 there has not been so dry a year in England since the memorable drought of 1887." It will be interesting to see how the present year's rainfall statistics compare with those of 1905. In 1905 Scotland as a whole had a deficiency of 5 per cent., while Ireland suffered to the extent of 12 per cent.

In addition to a great number of tables, the text is well supplied with numerous suitable maps and illustrations, making the volume a valuable summary of British rainfall for the past year.

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