

MAGNETIC OBSERVATIONS IN THE
NORTH SEA.

Magnetische Beobachtungen auf der Nordsee angestellt in den Jahren 1884 bis 1886, 1890 und 1891. Von A. Schück. (Hamburg: Selbstverlag des Verfassers, 1893.)

THE extended and valuable magnetic surveys—notably those of Rücker and Thorpe in England, and of Moureaux in France—which have been made during the last ten or fifteen years, have provided magneticians with considerable information as to the conditions of the earth's magnetism in the countries bordering on the North Sea. From such data, there should be no difficulty in calculating normal curves of the three magnetic elements for the comparatively small intervening region covered by that sea.

The surveys on land have, moreover, shown that there are several regions of local magnetic disturbance, and therefore the chief interest of a magnetic survey of the North Sea, would lie in the discovery from observation on board ship, whether local magnetic disturbance existed in the land under the sea. The settlement of such a point would be a valuable contribution to our knowledge of terrestrial magnetism, and certainly if large disturbance were observed in any locality, of great practical importance to navigation.

Captain A. Schück has, for some years, past been making observations of the three magnetic elements with a special set of instruments well designed for observations at sea. Great pains have been taken by him to eliminate all sources of instrumental error, and he selected those wooden ships which appeared to him so far free from iron in their construction, that his magnetic instruments when mounted on board would be undisturbed. The results of his four years' work are given in the text with full descriptions, and illustrated by drawings of the instruments, as well as a chart of curves of equal value for each magnetic element.

The execution of these charts leaves much to be desired, for the figures on the land are in many places so crowded together as to be almost illegible, and it would have been much more to the purpose, if the lines of equal values had been at once taken from the published maps of the several observers, whose work the author fully acknowledges, instead of crowding together the data upon which their lines are based.

Again, the curves for those regions covered by the sea are in places so abnormal that they invite inquiry as to the accuracy of the small number of observations upon which they in many parts depend.

Although the author gives general assurances as to the selected ships being free from any source of magnetic disturbance, there are really no results recorded, to show that the observations at sea were really free from the effects of iron in the several vessels on board which the magnetic instruments were used. Long experience shows, that unless specially built, no wood-built ship is so far free from iron that its action can be neglected, especially when minutes of arc in an observation are of importance.

If observations at sea over so small an area as the North Sea, and the channels south and west of Great Britain, are to effectually supplement those extensive

magnetic surveys made on the countries adjacent thereto, they must be stripped of every source of error. It does not appear that the observations recorded in this work are of the exact order suitable to modern requirements, however useful they might have been many years ago.

A work like that undertaken by the author, requires a specially-constructed vessel, devoted for the time to magnetic observations and other subjects of scientific inquiry. His objects were evidently delayed in execution by insufficient means to a satisfactory end.

MANUAL OF DAIRY WORK.

Manual of Dairy Work. By James Muir, M.R.A.C., Professor of Agriculture in the Yorkshire College, Leeds. 93 pp. (London: Macmillan and Co., 1893.)

THIS small primer on dairy work is in several respects a contrast to some of the books and pamphlets relating to dairy matters which have appeared within the last two or three years. Many of these have had too many points in common with a dairy utensil manufacturer's catalogue, and the information they contain has not always been either condensed or trustworthy. It is therefore a pleasure to take up Prof. Muir's little manual, which gives in small compass a great deal of information likely to be of value to every one interested in the production and use of milk. Apparently the book is intended for those who, having practical knowledge of the management of milk and its products, desire further knowledge of the principles upon which their practice is based, together with hints as to the best means of utilising their commodity according to the demands of their own particular market.

The information given is in most cases well up to date, but at the same time the discussion of obscure matters connected with the bacteriology of milk is carefully avoided. This is the more to be commended because every teacher of agriculture must know that looseness in describing the work of micro-organisms producing decay, or nitrification, or fixation of free nitrogen, has in many cases caused utter confusion in the minds of students; and more especially harmful is the imagination sometimes exercised by reporters and writers for the agricultural press. It is difficult to estimate the importance of Bacteriology in its relations to Agriculture and to Dairying, but in all discussion of the subject it is well to keep to ascertained and confirmed fact.

Prof. Muir's book is divided into ten chapters, the first of which deals with the formation and composition of milk. The description of the formation of milk in the udder is a trifle loose, the entire process being described as a casting off and breaking down of the cells which line the alveoli of the mammary glands. Milk is no doubt largely produced in this way, and especially must this be the case with colostrum when the glands commence or resume their activity; but it is more than probable that afterwards the milk is to some extent elaborated from the blood through the activity of the cells without so much actual shedding of the cells taking place. The great difference in composition between colostrum and normal milk shows that this latter process must be an important one.