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Review: Map Projections

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in America to three or four times that of Indian surveys. The expenditure in Great Britain over Ordnance Surveys of every class is so largely in excess of that of American or Indian that there must be a want of solid grounds for comparison. This is probably owing to the absolute difference in system: the plane-table is never used in England for Ordnance Survey work. An excellent chapter will be found on photo-topography, which is all the more valuable because it is in America only that the system has had a really fair trial. The author's opinion on this subject is to be found on p. 295: "In the average atmospheric conditions met with in the United States, the topographer will accomplish as much in one day with the plane-table as with the camera, while the resulting map will be decidedly superior;" but under peculiar conditions of cloud and mist, the camera may be useful in procuring a rapid record which would be impossible with the plane-table. American spelling occasionally startles our British conventional ideas throughout the book, and it is hardly consistent. For instance, the common technical word "plot" is sometimes written "plat" and sometimes "plot," and one wonders whether these are two words bearing different meanings, or whether they are one and the same. But this is hyper-criticism when applied to such a work as Wilson's. It is by far the best exposition of the "topographic" art which has yet appeared in the English (or American) language, and, taken in conjunction with Colonel Laussedat's admirable treatise on the history of the same subject, it marks, let us hope, a new era in that history—a clear recognition of the exact nature of the relations which exist between topography and geography.

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### MAP PROJECTIONS.\*

ALTHOUGH only consisting of about forty pages, this little pamphlet contains much valuable information on the subject of Map Projections, as well as many useful and practical suggestions as to their relative merits, and the most suitable projections to be employed under various conditions and circumstances. Major Close has evidently made a thorough study of the subject, and has taken advantage of the mathematical investigations of others, especially the article on Mathematical Geography by Colonel A. R. Clarke, C.B., F.R.S., in the 'Encyclopædia Britannica,' and the 'Traité des Projections des Cartes Géographiques,' by A. Germain. The first of these he very properly describes as "by

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\* 'A Sketch of the Subject of Map Projections.' By Major C. F. Close, C.M.C., R.E., 1901. London: Printed for H. M. Stationery Office, by Harrison & Sons, St. Martin's Lane

far the most important discussion of the question in English," and continually refers to it.

Notwithstanding the fact that Major Close has drawn largely on previous writers, it would be a great mistake to regard his pamphlet merely as a compilation, for indeed it is far more than this, and contains, in a few pages, much that cannot fail to be extremely useful, both to the practical surveyor and geographical draughtsman. The former will find what he might look for in vain in many more pretentious works—some useful and practical hints on the projections most suitable for plane-table surveying and field work, whilst the latter should profit considerably by what the author has to say about projections in general. A glance at many of our atlases will make it clear to any one who is at all acquainted with map projections, that this subject has not received sufficient attention from those responsible for their reproduction, for although it is, of course, impossible to represent the curved surface of the Earth on a flat plane without distortion of some kind, yet by a judicious selection of the projection to be employed, much can be done to minimize the errors. It is not, however, in atlases alone that a lack of judgment is often displayed in the question of projection, and there are cases where large and important maps have been drawn on most unsuitable projections, such as the well-known French Government map of Africa, on the scale of 1 : 2,000,000, referred to by Major Close. If, instead of the orthographic, a more suitable projection had been employed, such as Colonel Clarke's Minimum Error Perspective projection, there would have been much less distortion in the outer sheets of the map.

After a few preliminary remarks, and a note on Field Projections, Major Close gives a list of the thirty principal projections, which he has arranged under seven different headings according to certain characteristics which they have in common; these are as follows: Orthomorphic, Equal-area, Perspective, Zenithal, Conical, Cylindrical, and Conventional. It is, however, very properly pointed out that "these terms do not strictly represent classes of projections, as they are not all mutually exclusive," but it is a very fair arrangement on the whole, and where necessary, cross references have been made. After this come some very sensible remarks under the heading "Choice of Projections," and a list of the projections used for some important maps. In the second part of the pamphlet the author describes briefly the thirty projections he has selected, in the order in which they appear on the list previously given. The descriptions are extremely short—too short, in fact, in many cases—but nothing more than a sketch of the subject has been attempted. However, it is doubtful if more than two-thirds of the projections mentioned possess sufficient advantages to make them worthy of serious consideration for practical purposes, and if the author had reduced the number, and given the space thus gained

to the fuller treatment of those projections that are really serviceable, he would doubtless have rendered his little book of greater practical value than it is at present. He might then, without increasing the bulk, have given fuller information, and added other useful tables and diagrams.

Much confusion has hitherto existed concerning the names and designation of many projections, and Major Close draws attention to this, and suggests that the matter should be settled by those whose judgment may be considered final and conclusive. He also points out, what is doubtless the case, that a really good and exhaustive text-book on Map Projections in English is much needed, and suggests that one should be prepared, based upon Germain's work and Colonel Clarke's article, to which he refers. There are one or two misprints, but they are so apparent that the reader is not very likely to be misled by them.

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## REVIEWS.

### POLAR.

DR. NATHORST IN SPITSBERGEN AND GREENLAND.\*

IN the summer of 1898, Prof. Nathorst organized an expedition in the well-known whaler *Antarctic* to explore the König Karl islands. Favoured by an unusually mild summer, he was able, not only to thoroughly accomplish his principal object, but also to sail round Spitsbergen, keeping a sharp look-out for floats set adrift by André, or other indications of his fate, and to make a number of scientific observations and collections of all kinds.

Many of his most important geographical discoveries have been already described in these pages—the survey of Bear island, as well as its fuller examination by J. G. Andersson in the following year, and the survey of König Karl Land. The chapter on the history of the group appeared in *Ymer*, and a translation was published in the *Geographical Journal*, July—December, 1899. We cannot refrain from making a few remarks on Prof. Nathorst's rejection of the claims of Edge to be the discoverer of these islands. It is hardly necessary to point out that the words in 'Purchas his Pilgrimes,' "as farre to the northwards as seuentie nine degrees," will not bear the interpretation that Prof. Nathorst puts upon them. If, again, this interpretation were correct, and Edge had revised the map, surely the coast-line would have been drawn up to 79° instead of to about 78½°. Prof. Nathorst's suggestion that Edge was misled by an optical illusion is rendered doubtful by the fact that a Hull whaler, following Edge, also sighted Wiche's Land and named it Discovery. Still more untenable is the suggestion that Wiche's Land was the east coast of the Storfjord explored by Edge in the previous year, for that Edge himself was the discoverer of Wiche's Land must be evident to every one who reads attentively the whole passage in 'Purchas his Pilgrimes' down to the visit to Bell sound, in spite of the change of person referred to by Sir C. Markham.

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\* 'Två Somrar i Norra Ishafvet.' Af A. G. Nathorst. 2 vols. Stockholm: Beijers Bokförlagsaktiebolag, N.D. Pp. xxxv. + 352 and + xiv. 414. Three maps and numerous illustrations.