UPPER AIR CIRCULATION (1-6 KM.) OVER THE PHILIPPINES AND ADJACENT REGIONS

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I. INTRODUCTION

(A) Scope:

Since pilot balloon observations have been initiated but very recently in the region studied, this monograph has become a possibility only at the present time. In his earlier papers the writer had been forced of necessity to confine himself mainly to terra firma. In "The Mean Transport of Air in the Indian and South Pacific Oceans"(1) the *surface* air circulation was studied. The main air streams and frontal zones thus became evident, and the way paved for the monographs on "Outlines of Philippine Frontology,"(2) "Weather and Clouds of Manila,"(3) and two papers on typhoons originating near the Philippines, either to the west in the China Sea(4) or to the east in the Pacific.(5) However, in "The Upper Air at Manila"(6) the writer did attempt a very rough classification of air streams affecting Manila on the basis of about one hundred and fifty airplane-meteorograph flights, but the paper was admittedly only preliminary.

The present monograph is an assay to extend the "Outlines of Philippine Frontology" to the third dimension, tracing the main air streams up to five or six kilometers in the region surrounding the Philippines, for which data are now available, fortunately ample enough to be of considerable service to theory and practical forecasting. We could wish to have extended the area considerably, but lack of available observations proved an insuperable barrier; either no pilot balloon stations actually had yet been established, or censorship due to war conditions prevented publication by the countries concerned.

Since for most of the area only pilot balloon data were on hand, our scope had perforce to be mainly *kinematical*, i. e. it includes the identification of air streams aloft, their limits, direction of flow and intensity, their interactions especially in depressions and typhoons. The more exact determination of air mass characteristics, i. e. their temperatures, moisture content, stability, etc., must be left for later papers. The scope, therefore, is admittedly limited, but it is surprising just how much can be gleaned from an almost purely kinematical study, even though the necessary care is taken not to form conclusions unwarranted by the premises.

A further serious limitation is that the material covers for the most part only two years of data, at times only one year. This disadvantage is only partially overcome by the fact that we are dealing with the more stable tropics, since we shall see that upper air changes in our equatorial region are much more frequent than is usually supposed. Hence we insist that this paper must be considered as a *pioneer* effort, qualitative rather than quantitative and determinative.

Prolonged study has convinced the author that it is not wise to be too dogmatic about typhoons. He has, therefore, refrained from any discussion of tropical storms below the equator, preferring to leave them to the meteorologists of the countries more intimately concerned. Furthermore, considering the tentative nature of the paper, errors and wrong interpretations must inevitably have crept in, and hence criticisms and corrections will be most welcome.