

defied the sun in a black hard felt "bowler"; yet notwithstanding the neglect of ordinary tropical precautions everyone looked in the best of health. The men are bronzed and tanned; but one is glad to miss the sallow complexions and wan faces that Europeans show in tropical African coast towns.

The tolerance of heat shown in this part of Australia certainly supports Sambon's theory in regard to acclimatization. Sambon holds that there is nothing to prevent Europeans living and working as well as any black race in the hottest of tropical localities. He maintains that the supposed unsuitability of the Tropics for European settlement is due to disease and not to climate, and that as the special tropical diseases are due to germs, they may be cured or prevented when the life histories of the germs are known.

Of course the climate of subtropical Australia, with its exceedingly low humidity (in the interior) and its wide annual range of temperature, is quite unlike that of those regions, such as West Africa and the Philippines, which have been especially under discussion in the recent voluminous literature for and against white colonization of the Tropics. It should be compared, rather, with the southwestern United States or northern Argentina, in which Europeans seem to thrive no less than in Australia. However, the problem of acclimatization is so important and is, moreover, so far from a satisfactory solution that all observations bearing upon it must command attention. In the present stage of investigation the difficulty seems to be to extricate the immediate effects of meteorological conditions upon man from those indirect influences which are exerted through the medium of disease germs, the latter finding some climates more favorable to their development than others. Doctor Sambon is one of those who hold that climate *per se* plays but an insignificant part in determining the health of our race.<sup>5</sup>

DOCTOR HELLMANN'S "PRECIPITATION IN THE NORTH GERMAN RIVER BASINS".<sup>6</sup>

The scope of this work is not fully indicated by its title. Among North German rivers Doctor Hellmann includes all the streams of Germany that discharge their waters into the Baltic and North seas. Consequently only one important river system of Germany, that of the Danube, is excluded from consideration in this treatise.

In three massive volumes the author has gathered together all material regarding the rainfall of the German river basins, with the exception above noted, available down to the close of 1890, the year in which this great work was begun. In the case of rivers that take their rise outside of Germany, the territory considered includes all the upper basin of the river, from its source; consequently a great wealth of data for Russia, Austria-Hungary, Switzerland, France, and Belgium is here presented, so that this work constitutes by far the most extensive compilation of rainfall statistics ever made. The total number of stations represented in the tables is 3983, of which 2220 lie within the German Empire.<sup>7</sup>

The data tabulated comprise, for all or a part of the stations: Monthly and annual rainfall for each year of observation; greatest daily rainfall in each month; number of days with a measurable amount of rain; number of days with more than 0.2 mm.; number of days with snow; dates of first and last snowfall; number of days with sleet and hail.

<sup>5</sup>See his paper, "Acclimatization of Europeans in tropical lands", in the Geographical Journal, December, 1898, p. 589, and the interesting discussion thereon. See also C. Abbe in "Liberia" 1892, Bulletin No. 1, pp. 34-40, American Colonization Society, November, 1892, "Climate and Health in Liberia".

<sup>6</sup>Hellmann, G. Die Niederschläge in den norddeutschen Stromgebieten. Berlin. 1906. 3 vols.

<sup>7</sup>The most extensive works of this character heretofore published are Wild's "Regenverhältnisse des Russischen Reiches" and Eliot's "Rainfall of India". The former comprises results from 451 stations; the latter, 456. Schott's rainfall tables for the United States include some 1200 stations, but give the records in much less detail than do the works above named. Supan's "Verteilung des Niederschlags", with 1223 stations, is a collection of normals only.

The average length of a record is seven and one-half years. The following stations, within the region under discussion, have records of fifty years or more (to and including 1890):

*In Germany.*—Königsberg, 51 y.; Tilsit, 71 y. 3 m.; Danzig, 57 y. 7 m.; Breslau, 54 y. 9 m.; Gütersloh, 53 y. 11 m.; Münster, 51 y. 11 m.; Bayreuth, 59 y. 10 m.; Dresden 58 y.; Freudenstadt, 56 y. 1 m.; Isny, 57 y. 9 m.; Stuttgart, 72 y. 1 m.; Arnstadt, 53 y. 5 m.; Bremen, 60 y. 6 m.; Lübeck, 50 y. 5 m.; Frankfurt a. M., 54 y. 3 m.

*In Russia.*—Warsaw, 84 y. 7 m.

*In Austria.*—Bodenbach, 55 y. 4 m.; Deutschbrod, 55 y. 8 m.; Lemberg, 56 y. 8 m.; Prague, 51 y. 5 m.

*In France.*—Nancy, 58 y.

Owing to the diversity in the lengths of the records and in the periods to which they refer, and to other circumstances that render the older records mutually incomparable, the data tabulated in this work have not been charted. Instead, a rainfall chart (for Germany only) has been made up from observations of some 3000 stations during the decade 1893-1902; during which time fairly uniform methods of observation were in vogue, and the short records were quite easily reduced to the full period. This chart shows that—

1. The rainfall of Germany decreases from west to east, both along the coast and in the interior.
2. The coastal plains have less rain than the interior.
3. The rainfall is remarkably dependent upon altitude, so that the rain chart indicates the relief of the country quite closely. Deeply shaded areas, denoting heavy rainfall, indicate the location of the important mountain ranges—Harz, Schwarzwald, Bavarian Alps, etc.—but many minor elevations are rendered conspicuous by the fact that relative altitude has more influence than absolute altitude in increasing the rainfall.
4. The effect of the prevailing westerly winds is clearly shown in the heavier rainfall on the west slopes of the mountains.

The first volume of Doctor Hellmann's work forms the text discussion of the results tabulated in volumes 2 and 3, and in it the student of rainfall will find much that is suggestive and of general application. The fluctuations in the rainfall of Germany and neighboring countries during the eighteenth and nineteenth centuries are fully treated.

From the many interesting contributions to climatology contained in this work we extract the following Table 1, showing the most remarkable cases of excessive rainfall, of at least one hour's duration, recorded within the German Empire:

TABLE 1.—Excessive rainfall in Germany.

Place.	Date.	Duration.		Amount.
		h.	m.	
Waltershausen, Saxony	Aug. 14, 1884	1	00	2.95
Neustadt-on-the-Hardt	Sept. 7, 1886	1	00	3.86
Schwerin, Mecklenburg	May 11, 1890	1	35	4.37
Bobersberg, Brandenburg	June 21, 1895	2	00	5.06
Wildgarten, West Prussia	Aug. 1, 1896	1	40	5.28
Kennitz, Saxony <sup>8</sup>	July 17, 1887	2	00	9 5.90
Görlsdorf, Brandenburg	June 12, 1889	2	15	5.20
Berlin	Apr. 14, 1902	3	30	5.63

<sup>8</sup>A village near Neustadt. Not Chemnitz.

<sup>9</sup>Approximately.

PROGRESS OF METEOROLOGY IN AUSTRALIA.

By reading the dispatches from Melbourne, published in the Daily Telegraph, Sydney, N. S. W., June 16, 21, 22, 23, and 28, we see the progress being made toward the passage of the bill establishing a federal meteorological system for the whole of Australia. This bill was read for the first time in the Australian Senate on June 16; it makes provision for the appointment of a federal meteorologist, charged with the following duties: