The Climate of Korea

Its Probable Effect on Human Efficiency.

"The climate of a place is in a sense its average weather," so if one can judge by the amount of conversation about the weather, mine ought to be a very interesting subject and one in which we are all expert. Weather and Climate are perennially interesting to us all, but they have had a very probable influence on the life of man and his efficiency. I found men working on this as a problem of physiology and hygiene, but it goes much farther than that, it affects the very traits and qualities of a people. Along other lines I have been engaged in a study of the physiology of the Korean people, especially the value and effects of their diet; so I was led to attempt to correlate this study with it and see what the effect of the climate is upon them and, incidentally, upon foreign residents.

I wish to state in the beginning that my work has been mainly directed by the book of Prof. Ellsworth Huntington of Yale, "Civilization and Climate." I have made an attempt to apply the findings of Korea and the Korean people, to estimate the effect of the climate upon the people according to the conclusion he sets forth; I have not followed his conclusions exactly, as will be seen later, but I have tried to make a study of the climate and its effects along the lines he laid down. I have also utilized to a much
THE CLIMATE OF KOREA,

AND ITS PROBABLE EFFECT ON HUMAN EFFICIENCY.

by

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“The climate of a place is in a sense its average weather,” so if one can judge by the amount of conversation about the weather, mine ought to be a very interesting subject and one in which we are all expert. Weather and Climate are perennially interesting to us all, but they have had a special interest to me since I began to look into their probable influence on the life of man and his efficiency. I found men working on this as a problem of physiology and hygiene, but it goes much farther than that, it affects the very traits and qualities of a people. Along other lines I have been engaged in a study of the physiology of the Korean people, especially the value and effects of their diet; so I was led to attempt to correlate this study with it and see what the effect of the climate is upon them and, incidentally, upon foreign residents.

I wish to state in the beginning that my work has been mainly directed by the book of Prof. Ellsworth Huntington of Yale, “Civilization and Climate.” I have made an attempt to apply the findings of Prof. Huntington to Korea and the Korean people, to estimate the effect of the climate upon the people according to the conclusion he sets forth; I have not followed his conclusions exactly, as will be seen later, but I have tried to make a study of the climate and its effects along the lines he laid down. I have also utilized to a much
less extent the books "Climate, considered especially in relation to man," by Prof. R. DeC. Ward of Harvard, "Weather Influences," by Prof. E. G. Dexter of the University of Illinois, and "The Effects of Tropical Light," by Major Woodruff, U. S. A. The climatological data I have used, has been secured from the reports of the Meteorological Observatory of the Government General Chosen, covering the years 1905 to 1917 but for varying periods for the several stations, from 3 to 18 years. Without these reports, this paper would have been impossible. For comparisons, I have used data from Hann's "Handbuch der Klimatologie," and from a few other sources, copied from U. S. Government reports. I have also a few observations of my own to report. Using the data at hand, I have attempted to estimate the total probable effect of the climate of Korea upon human efficiency. As to the accuracy of the estimate I have only my observations in general, and very meager comparative data. The estimates must be checked up by extensive observations, tests and experiments upon Koreans and other nationals.

This paper will have two parts, first a study of the climate of Korea and then an attempt to estimate its effect upon the people living here.

The character of the climate depends upon so many factors, I do not care to discuss them at length; the most important ones are Latitude, relation of land and water, and prevailing winds. In a word, the Climate of Korea is of the "Continental type," modified by monsoons from the north and west most of the year, and from the south during the summer.

Korea lies between the parallels of 34 and 43 N. i. e. wholly in the Temperate Zone. It extends a little south of Spain, Italy and Greece, and not so far north as Italy. Seoul is in the latitude of Sicily and Southern Greece. Korea is just a little north of Palestine, Jerusalem is in latitude 31° 48', Antioch is in about the same latitude as Kongju. Again, Korea's position corresponds to that of the eastern part of the United States from Wilmington, N. C. to Ports-
mout, N. H.; or to the central part from Little Rock, Ark. to northern Iowa; or to the West Coast from Los Angelos to southern Oregon; so that Korea has about the same range of latitude as California, but lying a little farther north.

It is interesting to note that the mean temperature month by month and annually, is about the same for Seoul and New York City, though Seoul is considerably farther south. Again Korea has more cool weather than the corresponding latitudes in Italy. Being so nearly surrounded by the sea, and the winds blowing over the sea, Korea has a much moderated climate. It is to the winds and the seas that Korea owes having more "climate" than "weather."

Though one cannot get out of sight of the mountains in Korea, their altitude per se, has not a great effect on the climate. The main range along the eastern coast has few points more than 6,000 feet above the sea, so the habited part is not high, say in some places 3,000 feet. The influence of the mountains is indirect, cooling the moisture-laden winds that blow off the seas and giving Korea an abundant rainfall.

The prevailing winds of Korea are of the monsoon type; they blow from the north and west except during the summer, when the wind is from the south. The cold winds from Siberia and Manchuria come to Korea in the winter, but are tempered for the central and southern parts by having to cross the warm Yellow Sea. The summer winds from the China sea are moisture laden and give us the rainy season. Northeast Korea, however, has a northeast wind in the summer, off the Japan Sea.

For our present purpose atmospheric pressure and its changes are of only minor importance so far as the direct effect is concerned, and so will not be taken up separately. But the main elements of Climate, i.e. Seasons, Temperature, Humidity, Rainfall, Storms, Winds, and Sunshine and Clouds, these must be taken up and discussed in order.

The map of the world, (Figure 1) showing Supan's Temperature Zones, and the prevailing winds for summer and
winter, will help to give a general view of the climate of the world and so comparisons for that of Korea.

Fig. 1. Supan's Temperature Zones, and Prevailing Winds.
Arrows show direction of wind, Jan. →, July →.

SEASONS. Like the rest of the Temperate Zone Korea has four seasons. I will take up the winter first:—

The winter in Korea is quite cold and especially in the northern part is severe. In the north, frost occurs in September or October; and for about five months, the mean daily temperature is below freezing at Chukochin on the Manchurian border, inland; streams are frozen over for the whole winter; severe snowstorms occur. The station at Chukochin reports temperature as low as -40.8°C. (-41.4°F.) Pyeng Yang reports -28.5°C. (-19.3°F.) Chukochin reports 114 days in 1916 with even the maximum temperature below freezing, nearly four months of such, and snow lay on the ground for 106 days. Seoul has over two months with mean daily temperature below freezing, and during the period of 1911-15 averaged 28 days a year below freez-
ing every hour of the day. The winters in the southern part are much less severe, the lowest temperature ever reported from Fusun and Mokpo being -14°C. and -14.2°C. (6.8° and 6.5°F.), “zero weather” (Fahr) is unknown at these places. Interior places like Taiku sometimes reach “zero,” -18.6°C. (-1.4°F.) being its lowest. During the year 1916, Taiku did not have the snow lie on the ground a whole day. The wind, during this season, blowing from off the continent has not an excess of moisture and so the precipitation is not great, though some snowstorms are reported, especially in the northeast part.

Summer to most of us means “rainy season.” I have referred to the summer monsoon blowing off the warm ocean, and pouring its floods of water over the land, more about this later. In the same way as the ocean waters temper the winter’s cold for central and south Korea, the summer heat is moderated and equalized. There are not such intensely hot days as are common in the United States, but the heat is continuous, so that the summers are more trying than in places in the United States having the same mean temperature.

The highest temperature reported by the Government stations is 39.6°C. (103.2°F.) from Wonsan, but this is exceptional. Taiku has the hottest weather and its maximum is 39°C, hence I use it in reference to the absolute maximum temperature instead of that from Wonsan. The coast towns in the south have less extreme heat, Fusun reporting a maximum of 33.6°C. (91.5°F.) and Mokpo 35.1°C. (95.2°F.) Taiku reports an average of 47 days a year with the mean temperature above 25°C. (77°F.) and 7 days with this as the minimum; but this cannot be considered very hot, except that the heat is so steady. Seoul reports 30 days with 25°C. as the mean temperature and 2 with this as the minimum. Chukochin in 1916 had only 8 days on which the mean temperature was 25°C. and only 81 days on which that mark was reached at any time during the day. Songjin reports only 31 days having a maximum temperature of as much as 25°C. and only 2 with this mean temperature.
As to the length of the hot season, of course it is longest in the region about Taiku, where the most intense heat is experienced. The mean temperature there is above 15°C. (59°F.) from the first of May till the middle of October, about 5½ months; it is above 20°C. (68°F.) from the first of June till after the middle of September. The coast towns like Mokpo reach these temperatures about two weeks later but continue till fully as late or a little later. Seoul and Pyeng Yang are about two weeks later than Taiku to reach these marks and fall below them about two weeks earlier in the fall. Chukochin is about a month later and falls in mean temperature below these marks about a month earlier, it has only about 7 or 8 weeks above 20°C. (68°F.) and 14 weeks above 15°C. (59°F).

The humidity of the summer is high, and this, with the steady heat and the rains, makes the total effect of the summers quite depressing, as will be shown later.

Spring and Autumn are nearly ideal seasons in Korea. The winter ends and spring advances almost imperceptibly—no hot days followed by severe cold, but a gradual warming up, with bright sunshine, occasional rains, and for the most part, gentle winds. There is in the southern part of the country, even as far north as Seoul a distinct short season of rains in April—see curves for rainfall. This furnishes an abundant supply of water to irrigate the rice fields and makes this an ideal region for rice-farming. The heat gradually grows more intense and the rains more heavy, and then summer has come.

The autumn is comparatively warmer than the spring, alike sunshiny and equable. There is a more distinct marking of the beginning of autumn than of any other season. The rains rather suddenly cease in September and there is a different feeling in the air. One of our number who has a gift for saying things, expressed it thus, "You go to sleep some night after a summer day, you awake to feel a different atmosphere, you know it is autumn and life is worth living." But autumn changes to winter so gradually we hardly know when winter begins.
The discussion of the particular elements of the climate will throw more light on the seasons.

**Temperature.** For the purpose of this paper this is the most important part of the discussion of the climate. I have already given the range of temperature in the north and south, summer and winter. The extremes for the country are seen to be -40.8°C. and 39°C. (-41.4°F. and 102.2°F.) a range of 79.8°C. (143.6°F.). But for any one station the range is less than this, places in the interior having the greatest range. Taiku goes down to -18.6°C. (-1.4°F.) and up to 39°C. (102.2°F.) a range of 57.6°C. (103.6°F.) Chukochin ranges from -40.8°C. to 35.5°C. (-41.4°F. to 96°F.), a range of 76.3°C. (137.4°F.) which is nearly as much as that of the whole country. The cold in this part of the country is much more severe than in the south, while the summer heat is nearly as great, hence this great range. The range for Seoul is about the same as for Taiku, from -21.5° to 36.7°C. (-6.7° to 98°F.), a range of 58.2°C (104.4°F.) The coast towns of the southern part like Mokpo and Fusun, have much less range. Mokpo has only 49.3°C. (88.6°F.) and Fusun 47.6°C. (85.6°F). Wonsan has a range of 61.5°C. (110.7°F.) Pyeong Yang ranges from -28.5°C. to 36°C. (-19.3° to 97°F.), that is 64.6°C. (118.3°F.). In all cases the most extreme cold occurs in January and the greatest heat in July or August. Figure 2 presents this extreme range of temperature graphically.

The range of the mean temperatures for the coldest and hottest months will naturally be considerably less than the extreme ranges. But the mean temperature for the whole of the month, day and night, is in all cases within 10°C. (18°F.) of the absolute maximum of the hottest day of the month. The mean temperature for January differs more from the most extreme cold, than does the August mean from the absolute maximum. This means that there are greater changes from day to day in the winter than in the summer. The ranges of the mean temperatures for various stations is also shown on Figure 2 in red. We see there that the range from the coldest January mean to the hottest
August mean for typical stations is as follows:—Fusan from 
-1.9°C. to 28.5°C. (28.6° to 83.3°F.), a range of 30.4°C.  
(54.7°F.;) Taiku from -6.2° to 31.8°C. (20.8° to 89.2°F.,) a range 
of 38°C. (68.4°F.;) Seoul from -9.1° to 29.6°C. (15.6°-85.3°F.,) 
a range of 38.7°C. (69.7°F.;) Pyeng Yang has a range of 
42.2°C. (75.9°F.,) and Wonsan 35.6°C. (64°F.).

Fig. 2. Extreme and Mean Range of Temperature.

F = Fusan. M = Mokpo. T = Taiku.
W = Wonsan. Sg = Songchin. Cn = Chukochin.
THE CLIMATE OF KOREA

I would like to call attention to the slight difference in the actual temperatures of the nine stations as shown in Figures. Take either the extremes or the means and Seoul is lower by a degree or two in January and Chokoehin.

Mr. Smith informed me that the Seoul Observatory are different in the January maps of Korea showing the January and July. (Figures 1 and 2). Through the courtesy of the Seoul Observatory have been allowed to copy here. The January map the climate of the northeastern part of the country. The temperatures are close above 25°C (77°F.).

We have shown in Figure 1 that the main range is the northern coast. Except for the area along the southern coast the main range is south from Danyang and east from the 23°C. This is the main temperature slope, by chance.

However, should I take up the temperature. I next want to discuss the temperature from month to month, the country is the coldest month and the hottest. In July the temperature rises in temperature, a fall in August. The change is a little more abrupt with the temperature that occurs at a corresponding change. The temperature curve may be seen by reference to Figure 2. Locations show the corresponding monthly temperature curves at different places at any point of Korea.

The range varies from the maximum of 21.7°C (70.1°F.) in January than Chokoehin but the August temperature is only 4°C (39.2°F.) higher, and Taiku is only 4.7°C (40.5°F.) lower than Chokoehin in August.
Fig. 4. Mean Temperature, July.

Isotherms (centigrade)
I would like to call attention to the small difference in the actual temperatures of the nine stations as shown in Figure 2. Take either the extremes or the means and they are all about the same for the summer, and Chukochin is the only one that is greatly different in the winter.

Mr. Takashima, of the Seoul Observatory, has prepared maps of Korea showing the Isotherms for January and July. (Figures 3 and 4). Through his courtesy I have been allowed to copy these. It will be noted that on the January map the 0°C. (32°F.) isotherm crosses the southern part of the country, leaving a good deal of the land south of this line. In the northern part of the country the lines are close together, as we approach Manchuria. The July map shows an area in the southern part that is above 25°C. (77°F.). We also notice that the coolest portion is the northeast coast and that the isotherms, in the main, run north and south, that for 23°C. (73.4°F.) is about parallel to the main range of mountains along the east coast. Except for the area of high temperature already spoken of, the temperature decreases toward both coasts from the 23°C. isotherm. There is an area of higher temperature along the Manchurian border in the interior.

Having shown the ranges of temperature, I next want to take up the temperature variations from month to month, the temperature curve for the year. January is the coldest month and from then to July there is a steady rise in temperature, a slight further rise in August, and then a steady fall till the next January. The fall in the autumn is a little more abrupt than the rise in the spring and occurs at a correspondingly later date; this can readily be seen by reference to Figure 5, which shows the mean monthly temperature curves for several places in all parts of Korea. The range varies as shown before, but all except that of Chukochin have the same characteristics; Chukochin has its maximum temperature in July instead of August like the rest, its curve is also more rapid in rise and fall; Mokpo is 21.7°C. (71.6°F.) warmer in January than Chukochin, but the August temperature is only 4°C. (7.2°F.) higher, and Taiku is only 4.7°C. (8.4°F.) hotter than Chukochin in August.
A table giving the mean temperature month by month for several places in Korea, and for comparison, some other places in other parts of the world is given (Table 1). The table also shows the absolute maxima and minima for these places to show the range of temperature. Data is from the reports of the Government General of Chosen, Hann’s “Klimatologie,” and U. S. Weather Bureau.
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The Climate of Korea
The variation of the temperature from year to year is not great; the highest mean temperature for any month for any place in Korea is less than $9^\circ$ C ($16^\circ$ F) more than the lowest mean temperature for the same month of any other year: and highest mean temperature for any year is only $2.1^\circ$ C ($3.8^\circ$ F) more than the lowest mean annual temperature. The table given below (Table 2) will show this. I give the highest mean temperature recorded for each month with the lowest, the hottest and the coldest. Data for Chukochin was not available.

**TABLE 2. VARIATION OF MEAN MONTHLY TEMPERATURE FROM YEAR TO YEAR.**

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I will also graphically present this in Figure 6, the black lines showing the highest mean temperature for the month and the red the lowest.

It will be noticed that there is greatest variation from year to year in the winter months, summer has a little more than spring and autumn. This agrees with our experience, there may be quite mild winters some year, and other year quite severe, but for the other seasons, all years are about the same. January, 1917 was the coldest in the period from 1906 to 1917, and January, 1916 was the warmest, being $8.9^\circ$ C ($17.8^\circ$ F) warmer than in 1917, in Seoul. July was most
severe in 1914 and coolest in 1913, the difference in the two years for Seoul was 3.8°C (7°F) but it was only 1.5°C (2.7°F) for August.

The Amount of Variation in the temperature is one of our most important subjects, it has such a great bearing upon the effects of the climate. Even at the risk of seeming tedious, I am going to take this up more carefully than the other parts of my theme. I have showed that there is very little variation from year to year, now I want to show the small variation for the days of the month and will then
take up the amount of variation from day to night. The records for Chemulpo are much more complete than for any other point, so I will use the data for that station. I think Taiku, Pyeng Yang and Chukochin undoubtedly would show a little more variation than Chemulpo, but consider the latter truly enough typical of the whole country to use it. If we take the maximum for the hottest day of a month and compare it with that of the coldest day, we find that there is a difference of from about 7°C (12.6°F) to 25°C (45°F), i.e. the hottest day in summer is only about 7°C more than the coolest day of the same month, and the warmest day in winter is 25°C more than the coldest day of the same month. The difference in the highest minimum and the absolute minimum is just about the same as for the maxima. If we take the mean temperature for the hottest and coldest days of the months, in the summer there will be about 5° to 7°C (9°-12.6°F) difference; in the winter there may be several days or even weeks between these extreme days, with slow changes from day to day in the interval, and such is the case. Table 3 gives the data for Chemulpo, it shows the absolute maximum (of the hottest day), the lowest maximum (of the coolest day), the highest and lowest minima, the means of the daily maxima and minima, and the range for the month. It also shows the daily range, which will be discussed later.

**TABLE 3. VARIATIONS IN TEMPERATURE, CHEMULPO, 1916.**

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Figure 7 presents some of this graphically. It will be noted that while the winter months from November to April have considerable range for the months, yet the range for one day is not great; also the changes from day to day are not great as well be shown later. This may be a long way round to show that there is not very much variety in the temperature of the summer months, and that in winter there is quite enough of it, but I want to emphasize that thing. We have enough data to enable us to state that there is greater variation in the northern part of Korea than in the southern part. I am convinced that this is one of the factors in producing a more hardy and energetic people in the north when compared with those in the south.

![Temperature Diagram](image)

**Fig. 7.** Variations in Temperature, Chemulpo, 1915-16.

- Range for month
- Greatest range 1 day
- Mean daily range
The greatest range of temperature for one day in Che-  
mulpo in 1916 was in January, amounting to 14.8°C (26.7°F)  
and in 1915 April had one day with 18.6°C (33.5°F). When  
we take both year’s mean daily range we, find very little  
difference in the two years. The greatest mean daily range  
was in November 1916, 9.0°C (16.2°F) and the least was 5.7°C  
(10.2°F) in July, 1915. Once again we see that the summer  
months have very steady heat, all the days about alike,  
while there is considerable change in the winter. Chuko-  
chin had a maximum daily range of 25.1°C (45.2°F), its  
minimum range was 15.3°C (27.5°F).

The mean daily range of temperature will be shown by  
taking the mean maximum and mean minimum temperatu-  eres for the months. This is practically the difference in  
temperature of day and night. This will best be shown in  
a table, giving the mean maxima, mean minima and mean  
range (Table 4) Figure 8 also shows this graphically for  
typical places.

**TABLE 4. MEAN DAILY RANGE OF TEMPERATURE.**

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</table>
As compared with the Daily Range in the East and Central U.S., it is about the same, only Chukochin has as great a range as the Rocky Mountain region, the Pacific Coast has less than any place in Korea.

![Graph of Mean Daily Range of Temperature](image)

*Fig. 8. Mean Daily Range of Temperature.*

Mokpo ——— Seoul ———
Taiku -o-o-o Chukochin —-I-I-I

The **Variation of temperature from day to day** is not great. The number of days whose mean temperature differed from the preceding day by less than 2°C (3.6°F) was 265 for Mokpo in 1916, and there were only 22 days that differed from the last by more than 4°C (7.2°F). Taiku had 251 days with less than 2°C variation, Seoul 262, Pyeongyang 256, and Chukochin 122; but Chukochin had 72 days with more than 4°C variation. The number of days having a rise in temperature is greater than those having a fall, but the reverse is true if we take those having a change of over 4°C. There are more sudden and great changes when the temperature falls and the usual rule is for a rather sharp fall in temperature followed by a more gradual rise extending over some days. I will give a table (Table 5) showing the number of days with less than 2°C change and those with more than 4°C, and the mean daily variation from day to day, in degrees centigrade.
TABLE 5. VARIABILITY OF MEAN DAILY TEMPERATURE
YEARS 1915-1916.

Number of days having under 2° and over 4°C change from preceding day, and mean variation in degrees cent.

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</table>

Figure 9 shows graphically the number of days with more than 2°C.
THE CLIMATE OF KOREA

Here again we note the greater variability in the winter months, the average number of days having more than 2°C change is from 2 to 5 times as many in winter as in summer. The explanation of this has already been given; the winter climate is a continental one, the wind from the north and west bringing the climate of North China and Manchuria into Korea; but the summer winds blow off the warm waters of the China Sea. The southern part of Korea has less variation even in the winter, for the winter winds from the interior of the continent must pass the warm waters of the Yellow Sea.

Hann gives a table in his “Handbuch der Klimatologie” that is very striking when compared with the same data for Korea. He gives the number of days for winter and summer having a mean temperature different from the preceding day by 2 or more degrees centigrade. I combine the items to show only the number of days with less than 2°C change and those with more than 4°C. (Table 6).

**TABLE 6.—VARIABILITY OF MEAN DAILY TEMPERATURE.**

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<th>N. E. Europe</th>
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<th>East Siberia</th>
<th>Mediterranean</th>
<th>East U. S.</th>
<th>Seoul</th>
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<tr>
<td>Over 4°C</td>
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<td>10.3</td>
<td>1.3</td>
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<td>6.7</td>
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<td><strong>2. Summer</strong></td>
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<td>17.1</td>
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<td>3.8</td>
<td>1.1</td>
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</table>

The mean daily variation of temperature as shown in Table 5, “mean variation,” is probably the most significant of all, in showing the evenness of the climate, of the five places studied, Mokpo has the least variability, the average daily variation for the year being only 1.8°C (2.9°F) and Chukochin has only 2.6°C (4.7°F). Figure 10 presents this graphically.
Fig. 10. Variation of Mean Daily Temperature.

Each space represents 5°C (9°F.); the base line for each place is the one below the initial letter.

M = Mokpo. \hspace{0.2cm} S = Seoul. \hspace{0.2cm} W = Wonsan.
T = Taiku. \hspace{0.2cm} P = Pyeongyang. C = Chukochin.

To put this in another way, we may expect a day in January in Seoul to have a temperature 3°C (5.4°F) higher or lower than the preceding; but in July we expect only 1.0°C (1.8°F) change from one day to the next, and we may expect only 4 or 5 days in the month to be more than 2°C (3.6°F) changed from the last. It is the continuous heat, without cessation that makes the summers of Korea so trying. There are few days of what we, from the central part of the United States, would call very hot days, but the unchanging heat, with the humidity of the summers makes them very hard on us and reduces the efficiency of the people. It is interesting to find in Hann something about the amount of variation from day to day for a few places. (Table 7).

**Table 7. Mean Daily Variation in Temperature.**

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<td>3.1°C</td>
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<tr>
<td>Boston, Mass.</td>
<td>4.1°</td>
<td>2.2°</td>
<td>3.1°</td>
</tr>
<tr>
<td>San Diego, Cal.</td>
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<td>0.6°</td>
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</tr>
<tr>
<td>Sacramento, &quot;</td>
<td>1.3°</td>
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<td>1.0°</td>
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</tbody>
</table>
Hann makes a special point of the Unperiodical Changes of temperature in the United States, and gives instances of over 30°C (54°F) change in less than 12 hours. This is a matter of experience with some of us.

The constant steady heat of the summers is shown again by the number of days having a mean temperature above 25°C (77°F); the average for the years 1911-15 was 39.6 for Mokpo, 47.4 for Taiku, 30.6 for Seoul, 18.2 for Pyeng Yang, and 5.5 for Chukochin (1915-16). Most of these days are in July and August. During the same period Mokpo had an average of 32.4 days with a maximum over 30°C (86°F), Taiku 60.6, Seoul 29.2, Pyeng Yang 21.8, and Chukochin none. These will be shown in Figure 11.

![Figure 11. Number of Hot Days.](image-url)

- Mokpo — — — Pyengyang ————
- Taiku -o-o-o Wonsan ———
- Seoul ——— Chukochin -1-1-1
HUMIDITY. The relative humidity in Korea ranges from 65 to 77% for the year according to the locality; it is of course greater in the summer rainy season. The mean relative humidity is not so great as we often think, we rather remember the extreme days and forget the many mild days. Korea has about the same relative humidity as the eastern part of the United States, but more than the central States; it is less than that of England and more than that of Italy. This will be most clearly shown in the accompanying Table 8, giving the relative humidity for points in Korea and some other places for comparison.

<table>
<thead>
<tr>
<th>TABLE 8. MEAN RELATIVE HUMIDITY, %</th>
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<tr>
<td>------------</td>
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<tr>
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<td>Seoul</td>
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<td>Washington, D. C.</td>
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<td>St. Louis, Mo.</td>
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</tbody>
</table>

The data for Washington is for but one year, the others all for several years.

The curve for relative humidity reaches its greatest height in the summer and is lowest in the winter. It is in general fairly like the curve for mean temperature. Figure 12 shows the curve for Seoul and Wonsan and for comparison that of Washington, D. C. It will be noted that while the temperature curves are very much alike, the months of July and August are most humid in Korea and in Washington are much drier. The drier air of Washington gives it a better summer heat. While the humidity of England is higher, the heat is not so intense.
THE CLIMATE OF KOREA

Fig. 12. Relative Humidity and Mean Temperature.
Humidity in red. Temperature in black.
Seoul ——— Wonsan ————
Waskington, D. C. ————

As to the daily variations in humidity, there is a great range, of course. There are a few days having a relative humidity of less than 50%, mainly occurring in the winter; Chemulpo had 17 such days in 1916 but only 6 in 1915. There are some days in the rainy season that have 100% humidity; Chemulpo had 29 days with over 90% in 1915 and 42 in 1916.

It will be noted too that the curve for Wonsan and Fusun are different from those of the rest of the country. The east side of the mountain range is drier except during the rainy season, the wind from the west losing much of its moisture as it passes over the mountains; but the summer monsoon brings the moist air directly to these places and their humidity is a little higher than the rest of the country.

RAINFALL. There is a memoir in English on the Rainfall of Chosen by Mr. T. Hirata, Director of the Chemulpo
Observatory, it is published in the Annual report for 1915. I have drawn upon it for information for this summary.

The rainfall map (Figure 13) shows two regions of greatest rainfall, in the vicinities of Fusan and Wonsan,

Fig. 13. Amount of Rainfall.
(in millimeters)
both having an annual rainfall of 1500 millimeters (60 inches). The Manchurian border has the least rain, under 600 mm (24 in). There is no part of the country that suffers from deficient rainfall; drought and famine are almost unknown in Korea. As will be shown in the table below, there is considerable variation in the rainfall from year to year, but never a serious drought. There are sometimes periods of a month when no rain falls, but these are generally not during the time rain is needed for the crops. Again even during the rainy season, it is uncommon for it to rain every day for more than ten days, the rains are more heavy than continuous even then. It is reported that there was rain in Wonsan for 33 days in succession (1905), the longest other record is 17 days. The rainy season occurs in June, July, August and September. The table below (Table 9) will give the mean rainfall for points in Korea and also give the rainfall for the year of greatest rainfall and of least. I add the figures for some other places to compare with these. Figure 14 presents typical curves.

### Table 9. Mean Rainfall

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As would be expected, the rainfall and relative humidity curves are alike. In the greater part of Korea the rainfall curve is quite smooth, a gradual rise from February to the maximum in July or August, then a smooth fall. The southern part of the country has its heaviest rainfall in July, the northeast has its maximum in August. Another point of note is that the southern part of Korea has a secondary maximum in April, a little rainy season; this will be clearly seen in the curves for Fusun and Taiku, in Figure 14.

The number of rainy days is greatest at Mokpo, which has a mean of 128 a year; i.e. days having more than 0.1 mm, a slight sprinkle: Wonsan has 123, Seoul 112, Pyeng Yang 106, Taiku 97; on about half of these days there is only a slight rain, i.e. less than 5 mm (1/5 inch). The distribution of the rainy days is according to the amount of rainfall for the months.
The variation of rainfall from year to year, as shown in the table above, is quite marked, the maximum being over twice as much as the minimum. There is often variation as to the month of heaviest rainfall, August sometimes having more rain than July in places with the greatest mean rainfall in July, the reverse is sometimes true.

The heaviest rainfall in 24 hours for Seoul is reported at 254.7mm (10 in), for Pusan 250.9mm, Wonsan 243mm, Mokpo 200.1, Pyeng Yang 167.4, and Chukochin 91.9 (less than 4 in). Such heavy rains cause high floods and while these great rains are not ordinary, yet very heavy rains are common.

The rainy season in Korea is not so long as that of Japan, and the mean annual rainfall is not so great. The annual rainfall is about the same as for the corresponding latitudes in the Atlantic States, and in these states there is no distinct rainy season, only a little more in the summer; the winters in Korea have not nearly so much precipitation as the eastern states. In the central states, the total is less and the heaviest rainfall is earlier, i.e. in May, June and July; August being comparatively dry. Italy has a late fall and winter rainy season due to the trade winds, not to monsoons.

STORMS. I have been unable to secure accurate data as to the storms of Korea, but experience agrees with the reports I have that severe storms are not common. The path of storm centers usually lies to the south or north of Korea, though some do pass directly over it; such as pass this country for the most part are over the south or north parts. The storms form in China over the Yangtze and may touch south Korea, especially in summer or early fall; other storms come from north China across the north border of Korea. My impression is that storm centers cross Korea not more than 10 times a year.
Fig. 15. Barometric Pressure, Chemulpo, 1916.
(readings in millimeters — 760 mm = 30 in.)

However there are frequent changes in the barometer (see Figure 15), with secondary low areas in Korea, bringing unsettled weather and storms of not great severity. There will probably be 40 or 50 such in a year, about 3 to 5 storms a month. There is not such distinct periodicity in the weather in Korea as in the United States where storm centers regularly pass about every 7 days; but there is at times of the year something of the same here and at about the same intervals on an average, but not so constant and certain. During the winter settled weather is the rule, may be a storm in 2 or 3 weeks. In October, November and December storms are rare. In the summer there are frequent heavy rains and some storms, but this is the season of the least variability in the barometer readings, though it averages considerably lower than the rest of the year. Typhoons occasionally reach Korea in this season.

It is remarkable how little thunder and lightning are heard and seen in Korea. The greatest number of days having thunder-storms is reported from Chemulpo, a mean of 13 days a year; but this reports all days on which even a very little thunder is heard. In ten years in Korea, I
have not experienced even one thunder-storm that I, a Missourian, would call severe, and hardly even one to take notice of.

WINDS. I have already spoken of the prevailing winds which blow most of the year from the north and west, then in summer from the south. To these monsoons, the character of the climate is mainly due. The northeast coast has a summer wind from the northeast, this gives Wonsan its great rainfall. Songjin further up the coast does not get this northeast wind and so has only about half as much rain in a year as Wonsan and still less during the rainy season.

Calm days are rare in any part of Korea, but for the most part there is only a gentle breeze except on the coast. There is no long continued hard blow. Seaports, such as Mokpo, Chemulpo and Fusun report 178, 173, and 128 days a year on which strong winds blow; i.e. over 10 meters per second or 20 miles an hour; but Taiku, Seoul and Pyeng Yang report only 10, 20 and 19 such days. Except during typhoons the winds generally calm down a great deal at night. March and April have the most strong winds. The mean velocity by months does not vary much however. Mokpo and Chemulpo have the most wind, 6.8 and 6.1 meters per second respectively (14 and 12.5 miles an hour). Fusun has 5 m. per second (10 miles per hour), Taiku 2.5 Seoul 2.7, Pyeng Yang 2.8, Wonsan 2.9 (5 to 6 miles per hour).

SUNSHINE: Korea is a land with much sunshine and bright skies. Mokpo with the least sunshine has 2,298 hour, a year, i.e. about 6 1/3 hours a day for every day in the year; Pyeng Yang has 2,776 hours a year which is over 7 1/2 hours for every day in the year. The distribution of the hours of sunshine is quite even through the year. The longer days from April to October have the most hours of sunshine, even July and August have more than the winter months. But in the percent of possible sunshine there is a great reduction during the rainy season, the percent of sunshine is greatest from October to April.
Fig. 16. Hours of Sunshine, 1911-15.

- Mokpo
- Seoul
- Taiku
- Pyeongyang

Fig. 17. Amount of Sunshine, Chemulpo, 1906-15.

- No. hours Sunshine
- % possible
- Amount of clouds (curve inverted.)
Figure 16 shows graphically, for typical places in Korea, the number of hours of actual sunshine; Figure 17 shows the relation between the actual hours of sunshine and the percent of possible sunshine, Figure 18 shows curves of the percent of sunshine; for places in Korea and the United States for comparison. The table below (Table 10) gives the sunshine for places in Korea and several other places, data for the latter from Hann.

### TABLE 10. AMOUNT OF SUNSHINE.

Percent of possible sunshine.

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<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
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Rome, Italy not so much as Rome, South Italy a little more.

---

**Fig. 18.** Amount of Sunshine, %.

- Mokpo
- Seoul
- Taiku
- Pyeongyang
- New York City

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The amount of clouds is nearly the inverse of the amount of sunshine, though not exactly so, for there may be considerable cloudiness and the sun still shine, or a few clouds may cut off the sunshine from the apparatus. Table 11 gives the amount of clouds on a scale of 1 to 10.

**TABLE 11. AMOUNT OF CLOUDS.**

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<tr>
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<td>4.9</td>
<td>5.9</td>
<td>6.7</td>
<td>6.0</td>
<td>7.7</td>
<td>7.2</td>
<td>6.2</td>
<td>7.3</td>
<td>6.5</td>
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<td>3.6</td>
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<td></td>
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<tr>
<td>Shanghai*</td>
<td></td>
<td>6.3</td>
<td>6.7</td>
<td>6.9</td>
<td>6.9</td>
<td>7.1</td>
<td>7.5</td>
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<td>5.7</td>
<td>6.3</td>
<td>5.9</td>
<td>5.1</td>
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<tr>
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<td>6.5</td>
<td>6.3</td>
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</tr>
</tbody>
</table>

* This report is not for the city of Shanghai, but a point near.

We see that Korea and "Sunny Italia" have about the same amount of sunshine. Compared with southern California and the Southwestern States, Korea has less sunshine; these regions having about as much sunshine as any place in the habited world, probably too much for the best good. Korea has about the same amount of sunshine as the Middle Atlantic States, as it has about the same rainfall and temperature; and there probably is not much difference in the middle West and Korea, but more sunshine in Korea than along the Great Lakes. It must be noted too that in Korea the greatest amount of clouds coincides with the time of greatest heat, but in the central and eastern United States the summers are seasons of great sunshine, the winters being more cloudy; this is a point in explaining the greater variability of the weather in the States. The clouds in Korea help to protect us from the intense sunshine of the summer—a distinct advantage in favor of Korea.

The number of clear days will of course correspond to the amount of sunshine and be the inverse of the amount of clouds. Counting as clear days all having less than 20% of
cloudiness, the number of clear days for Mokpo is 54, Fusan 95, Taiku 77, Seoul 69, Pyengyang 91, Wonsan 101, and Chukochin 49.

The number of sunless days, of course, corresponds to the cloudiness in general, Mokpo has 45 sunless days a year, Fusan 46, Taiku 31, Seoul 37, Pyengyang 24, Wonsan 53, Chukochin 38.

**BLACK BULB THERMOMETER.** I have no comparative data and have only begun to keep records of my own observations on the intensity of the heat as shown by a "black-bulb thermometer." I kept records of a black-bulb and ordinary thermometers side by side for some time in July and August 1918, at Sorai Beach, and have records for a short time since, taken on the compound of Severance Union Medical College, Seoul. Such a thermometer is not heated by the air, but absorbs the direct heat of the sun and the radiation from the earth or any heated body near. At Sorai Beach my thermometers were on a second story porch exposed to direct sunlight, but the distance from the ground lessened the effect of the radiation from the heated earth. The black-bulb thermometer showed highest temperature in the afternoon from two to four o'clock; at these times it often registered $12^\circ C (21.6^\circ F$) more than the ordinary thermometer and the latter was $5^\circ$ to $8^\circ C (9^\circ$ to $14^\circ F$) hotter than the air in the shade. The mean excess of the black-bulb over the ordinary thermometer for the period of six weeks was $8.9^\circ C (16^\circ F$. On clear days the black-bulb thermometer registered from $40^\circ$ to $50^\circ C (104^\circ-122^\circ F$) at times when the ordinary thermometer was reading $30^\circ$ to $35^\circ C (86^\circ-95^\circ F$) and the temperature of the air in the shade was $25^\circ$ to $30^\circ C (77^\circ-86^\circ F$). The readings at the time of the absolute maximum black-bulb reading were air temperature $30^\circ C (86^\circ F$) ordinary thermometer in the sun $38^\circ C (100.4^\circ F$, black-블루 50° C(122°F); the relative humidity at the same time was 58% and a gentle breeze blew off the bay. Needless to say that black clothing was not desirable at such a time.

During the winter when the maximum daily temperature was seldom up to $15^\circ C (59^\circ F$ the black-bulb thermometer.
against a brick wall, often registered over 40°C (104°F). But this is manifestly not a fair place to keep a thermometer.

On the lawn during April 1919, the Black-bulb thermometer at 2 p.m. registered a mean temperature of 38°C (100.4°F), while the ordinary thermometer in the same place read 25°C (77°F) and the mean temperature in the shade was 15.4°C (59.7°F). The black bulb often read 15°C (27°F) more than the ordinary thermometer and sometimes read more than 20°C (36°F) above it and 30°C (54°F) above the temperature in the shade. These things indicate an intense heat radiation and insolation in Korea; but comparative data are needed before any conclusions can be drawn.

OZONE. I hesitate to say anything of the “ozone-cage” I have used for a short time, the method is so unreliable. I wanted to see if Korea, without thunder-storms, would have any ozone at all. And so, while I realize that other things besides ozone will change the color of “starchiodide papers,” I have been making some tests according to this method. I do not find the air of Seoul giving much change to the paper, the average would seem to be about 2 on a scale of 10. This would indicate a trace of ozone (or hydrogen peroxide probably) in the air here, but considerably less than in the central United States. The proximity to the sea probably accounts for the trace rather than storms.

With this summary of the climatic conditions of Korea, I pass to the second, and for this time, briefer part of my paper, the discussion of the probable effects of this climate on man. As stated before, I have as yet been unable to carry out the experiments and make the tests and observations necessary to check up my conclusions. Relying upon the investigations of men in other lands, I will give what seems to me to be the probable effects of the climate of Korea.

The main factors in estimating the effects of a climate are the Mean Temperature month by month, the Variability of the Weather, the Relative Humidity, the frequency of Storms, and the intensity and amount of Light. There are other factors but their importance in Korea
THE CLIMATE OF KOREA

seems to be only a very minor matter and so they are not discussed. Of these factors the most important one is that of the mean temperature, all investigators are agreed as to the effects of heat and cold; and it is a matter of such common experience that heat and cold, when beyond a certain degree, are very great in their influence upon our well-being and upon the ability, as well as the inclination to work. The effects of humidity are well established. There is less certainty as to the effects of storms and the changeableness of the weather, but the evidence for their effects is too strong to ignore. There is dispute as to the effects of light, I am not ready to attempt to estimate the influence of light in Korea very definitely, only a general statement will be made at this time.

EFFECTS OF TEMPERATURE. Very little need be said as to the mean annual temperature, it has very little significance in places where there is much seasonal and daily variation. Of course it is possible to roughly mark the climatic zones according to the mean annual temperature, as Supan and others have done. High mean annual temperature is found only in the tropics and they are well known to be bad in their effects upon the white man; and the natives of the tropics are uniformly low in the scale of civilization, and we cannot doubt that the climate has a big part in this; the degeneration of superior races emigrating to the tropics is very marked before many years or generations. And where the mean annual temperature is near the freezing point, it is too cold for human efficiency. Within the temperate zones, very hot or very cold regions, as shown by the mean annual temperature, will correspond in effect to the tropic or polar zones.

In estimating the effects of temperature upon man the greatest factor is that of the mean monthly temperature. Months that are torrid in temperature have the effect of torrid zone heat; and frigid months have their effects according to the severity of the cold. I think that the effects of either the torrid zone continued heat or the constant cold of polar regions are cumulative; the effects of a month or
two of weather as hot as that of the tropics is not so great as when it lasts practically all the year, the body has opportunity to recuperate during the cooler seasons. So I am sure that a factor that would be correct for the degree of heat in a temperate region would not be adequate to give the true effect of the same degree of heat in the tropics. This has a bearing in estimating the effects of the climate in Korea, the length of the hot season and the cold season affecting our estimates.

Again the fact of hot or cold days in a month of moderate mean temperature is not of much significance as to the final effects, the changeableness itself having, however, a favorable result. Nor is the daily range of temperature of much significance, except where the range is too slight in hot seasons; even though the day be quite hot, if the night is cool we get along well, the climate is good; the change of temperature in this way too is, if anything, stimulating.

Taking as many factors of efficiency into account as we can—the psychical and the physical—it is found that about 15°C (59°F) is the most nearly ideal temperature for a white man, and is given a rating of 100%. Temperatures below 15°C are progressively worse, 0°C (32°F) is rated at 96.5%, —10°C (14°F) is rated at 94.5%. Similarly, temperatures above 15°C are increasingly bad and given lower ratings, 20°C (68°F) is rated at 98.4%, 25°C (77°F) at 95.9%, 30°C (86°F) at 92.5%, and 35°C (95°F) at 84.3%. This is the estimated effect of temperature only, when humidity storms, etc., are constant, the effects of these factors must be separately considered. So we can estimate the effect of a climate by taking the mean temperature for each month and using the efficiency factor for that degree of temperature; we get the percent of efficiency that will probably be found. Tables are prepared giving the percent of human efficiency at different temperatures; Huntington gives such a one and I have used it in my calculations.

I have taken the mean temperature month by month for several places in Korea and using the percent factor have calculated the curves of human efficiency for these places. The results of these calculations are shown graphically in Figure 19.
Fig. 19. Human Energy in Korea, Estimated on the Basis of Climate.

On basis of Mean Temperature by months

Correction for lack of Variability

"" Humidity

"" Spring

Rating on scale of 1200, shown beneath names.
It will be noted that if nothing but temperature were to be considered, human efficiency in Korea would be about 100% in May and October. But in reality other factors must be taken into account and the results are not so easily obtained. Spring and fall both show high ratings, and both summer and winter cause marked decreases. There is no doubt about the truth of the decrease in summer; we all want to get away to the seashore for a vacation and lose much of our ambition at that season. In winter we try to escape the effects of the climate by heating our houses in which we do our work. Outdoor work is at a minimum in winter. In parenthesis, I will say that the foreigners generally heat their houses too hot in winter; a temperature of 70°F (21°C) is rated at about 97.9%, we ought to keep the house nearer 60°F (15°C), which is rated at 100%; if we have moisture in the air 60°F is as comfortable as 70° and is better for the health and efficiency.

Taking into account only the actual mean monthly temperature, the curves for spring and fall are about the same, but really that for spring should be lower. This has been clearly shown by Huntington for the United States and it is reasonable. The severe cold of the winter lasts longer in its effects, it takes us longer to get over the cold season; we have realized this for ourselves, and the medicine vendors take advantage of it to sell "spring tonics and blood purifiers." And too it has been shown that there is a difference in the effects of a rise in temperature and of a fall, a slight rise or fall both are good in their effects, but we can stand a greater fall than rise without it causing a slump in our abilities, and more than this, within moderate ranges a fall in temperature is more stimulating than a rise: in the spring we have rise in temperature and in the autumn it is falling, so the stimulation of autumn fine days with falling temperature is more than that of spring days equally fine. I have made allowance for this on my curves as will be seen.

As to whether the effects of temperature are the same for the Korean people as for the white race, I cannot say definitely; I think the effects will be practically the same,
but with probably a slight advantage in favor of the Koreans in ability to stand hot weather. My hopes are that we can work this out and find the optimum temperature for Koreans and how well adapted they are to their climate.

The effects of the mean monthly temperature is about twice as great as all other factors. In Korea this would mean a maximum effect of 6 to 8% for certain months, and 2 to 3% for the whole year. If we took only the mean annual temperature it would be only about 1 ½% reduction for the worst place in Korea and the most of the country would rate at about 99%, instead of at 97% when we take the monthly means.

**Variability.** Another important factor in the effect of temperature is the variation from day to day. An unchanging climate lacks stimulating effects, it grows monotonous and is depressing as to its final effects. Even the ideal temperature would be too uniformly stimulating and would in the end tend to weaken. Huntington likens it to a horse pushed on a long drive, he finally tires out. There is considerable evidence to show that a continuously fine climate, even at the ideal temperature, is a factor in producing nervous disorders, especially neurasthenias. The effects of too great sudden change are also bad for the time being, but in peoples frequently exposed to such, there is developed a capacity to react to these changes. It is like a splash of cold water on the body, or a sudden hot plunge, there is a physiological reaction that is good for the body. The people living where they have “weather” are the most virile people of the world. Dexter and Huntington very clearly show the value of having “weather”. Huntington shows that men do more work and better work when there is change in temperature from one day to another.

Huntington in his estimates took the seasonal range as an approximation to the variations from day to day; he considered that if the mean minimum was not below—7°C (19.4°F.) and the mean maximum not above 23°C (73°F.) there would be no reduction in the efficiency on account of the excess of changeableness, if more than this it would
be bad; but he did not give a basis for estimating the effect if there was not much variability. I think his basis applies to the United States and to Europe where there are greater changes from day to day, but I do not think we can adopt it in our estimation for Korea. Only in the extreme north and interior do we find the mean minimum less than $-7^\circ$C. and only in the hottest portions do we find the mean maximum above $23^\circ$C. But there is good seasonal range for all parts of Korea. As the curves given before have shown, the mean range of temperature is about the same for Korea as for the eastern part of the United States, where Huntington's observations were made; but there is not nearly so great variability in Korea, as we have shown. So since the variability is less in spite of the seasonal range being the same, I have had to take another basis for estimating the effect of this factor. I will not detail the steps by which I deduced the rule, I only say it is largely based on data given by Huntington.

In winter there is a mean daily variation in temperature of over $2^\circ$C. $(3.6^\circ$F.) and more than 12 days each month have over $2^\circ$C. rise or fall; I consider this sufficient daily variation and not excessive and so left the curve as it stands after estimating it on the simple basis of mean monthly temperature.

For the rest of the year I took the following rule:

Daily variation over $2^\circ$C., over 12 days $2^\circ$C., change—no reduction.

<table>
<thead>
<tr>
<th>Variation Range</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5°-2.0°C, 9-12</td>
<td>2°C change-0.5%</td>
</tr>
<tr>
<td>1.0°-1.5°C, 5-10</td>
<td>2°C -1.0%</td>
</tr>
<tr>
<td>0.5°-1.0°C, 4-8</td>
<td>2°C -2.0%</td>
</tr>
<tr>
<td>0.0°-0.5°C, 4-8</td>
<td>2°C -2.5%</td>
</tr>
</tbody>
</table>

The results of applying this rule are shown in the curves of Figure 19, still further reducing the efficiency shown on them. The reductions from this factor are considerable, more than that from humidity but much less than for the mean monthly temperature.

HUMIDITY. It is well known that when the humidity is great, high temperatures are much more trying. I have estimated a possible maximum effect of 3% for humidity. The following rule was used in estimating this effect:
THE CLIMATE OF KOREA

Up to 20°C (68°F), a humidity of not over 70% is good. Temperature above 20°C, Humidity 100% reduces efficiency 3%.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Humidity</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>20°C</td>
<td>85%</td>
<td>1.0%</td>
</tr>
<tr>
<td>20°C</td>
<td>80%</td>
<td>0.6%</td>
</tr>
<tr>
<td>20°C</td>
<td>75%</td>
<td>0.3%</td>
</tr>
<tr>
<td>20°C</td>
<td>70%</td>
<td>0.1%</td>
</tr>
<tr>
<td>20°C</td>
<td>60% or less</td>
<td>no reduction</td>
</tr>
</tbody>
</table>

It would be hard to establish these factors, but there is a basis for them. The results of applying them in Korea is also given in Figure 19.

During the spring and autumn the humidity and temperature are both near the optimum, so only a very slight reduction is estimated. In the winter, contrary to the common opinion, the degree of humidity is advantageous rather than otherwise; it is not excessive at all, and is high enough to prevent the evils of dry climates. But if we do not provide moisture in our heating systems, the air of our houses is so dry that furniture and people feel the effects. Let me startle some of you by stating that it is “dry cold” that is most severe, not damp; this is tested and is reasonable if we think it through. I make no reductions in estimated efficiency on account of humidity in winter. But in the summer there is a marked effect of the high humidity. There are three months or more having a temperature of over 20°C and humidity over 75%. Mokpo and the rest of south Korea suffer most from this.

The electrical condition of the atmosphere is very closely related to, if not conditioned by the humidity. Dry climates have an atmosphere highly charged with electricity, and mental and physical exhilaration results; men in these regions work with more vigor. They probably wear out quicker if they do not stop for rest, but the stimulation is real. So far as I know, no tests have been made as to the electric potential of the earth and atmosphere in Korea, but the humidity of the air would lend support to the opinion that the electric potential is low, and the stimulation from it
is largely lacking. Low electric potential results in few storms with lightning, and also probably results in low ozone content in the air. I am unable to express any definite opinion as to full effects of this lack of electric and ozone stimulus, it may be entirely covered by the depressing effects attributed to high humidity and it may be I have under-estimated its effects altogether, I cannot say.

For the present, I have had to be content with letting the reduction on account of the lack of variability in the climate of Korea, represent the total effect of this element and storms as well. I am convinced however that the comparative absence of storms would further reduce the curves, but data is not at hand to compute this. There is a stimulus in a storm, it produces a good reaction. The regions where the people show greatest vigor and efficiency are all regions of storms. Central and Eastern United States and Northwest Europe are the most stormy regions of the world where other conditions are favorable to man. Japan has more storms than the rest of the Orient where other conditions are favorable, and her people have shown more vigor. I am inclined to think that we would have to further reduce our curves by ½ to 1% for the most of the year to get the true curve for Korea.

A secondary effect of storms is the succession of clear and cloudy days. Accurate observations show that efficiency is greater on cloudy days—except when too long continued and then they become depressing. The whole of this may be summed up by saying that “Weather is good.” Storms, cloudy days, and changeable temperature all stimulate man.

The winds in Korea probably have no considerable effect; strong winds, long continued, so seldom occurring. I think, too, we may ignore the effects of low atmospheric pressure per se, the storms and changes in the weather accounting for all the effects.

My present opinion is that Korea has too much sunlight for the highest human efficiency, especially causing neurasthenias, which are very common in Korea both among the
Koreans and among foreign residents. I will not attempt to estimate the extent of its influence.

To suggest the comparative rank of the climate of Korea among the countries of the world, I wish to present a map of the world showing how Prof. Huntington estimates the distribution of human energy on the basis of climate. (Figure 20). He takes the percent rating for each month, and so a perfect climate would have a total rating of 1200. At that rate he grades all countries above 1175 as "Very High," 1150 to 1175 as "High"; 1125 to 1150 as "Medium," and 1085 to 1125 as "Low," and below 1085 as "Very Low." It will be noted that he rates Korea as "High."

![Fig. 20. Distribution of Human Energy on Basis of Climate. (from Huntington)](image)

As will be noted on Figure 19, I have given it this rating, i.e. 1150 to 1175; for particular places, I grade Seoul, Chemulpo, and Taiku each a little above 1161, Seoul being the best of the three. Mokpo, with its long, more humid summer, is more depressing than Seoul. I grade it at about
1159. Pyeng Yang has a more severe winter, and though the summer is better, it ranks about the same, 1160. The winter in the extreme north is too severe, Chukochin ranks only about 1157.

Practically all of the central and eastern parts of the United States and Northwest Europe are rated above 1175 by Huntington. If we considered only mean monthly temperature, Korea would rank about 1170 for the main part of the country, the depressing effects of uniformity and high humidity combined with heat in the summer bring this down 10 to 15 points more. I think that I have not at all exaggerated the depressing effects of the climate.

Figures 21, 22, and 23 show comparative studies of places in Korea and the United States. They tend to confirm the impression of the accuracy of my estimated curves.

Fig. 21. Mokpo and Tampa, Florida.
Mean Temperature, Mokpo --- ---, Tampa ---
Relative Humidity, --- --- ---, --- ---
Efficiency, Mokpo (est.) --- --- --- ---
Tampa (Huntington) --- --- --- ---
Figure 21 compares the Mean Temperature, Relative Humidity and Efficiency curves for Mokpo and Tampa. Tampa is hotter than Mokpo and the observed efficiency curve for Tampa taken from Huntington's book shows a greater summer depression than the estimated one for Mokpo. This is as expected.

Fig. 22. Seoul and Connecticut.

Mean Temperature, Seoul ———, Connecticut ———
Relative Humidity, " ——, " ———
Efficiency, Seoul (est) ———,
Connecticut (Huntington) ——— (1910-13)
(1911)

Figure 22 compares Seoul and Connecticut, the Temperature curves are very similar, the humidity is greater in Seoul during the hot months. The estimated depression for summer in Seoul is not so great as in Connecticut when it should be more, and the curve for the spring is too high; I
think this shows quite conclusively that I have erred on the conservative side. It will be noted that there is a second Efficiency curve for Connecticut for the year 1911, it shows a higher spring efficiency than that for the whole period.

I think the curves for Mokpo and Columbia, (Figure 23), are strikingly similar, all of them. The humidity of Mokpo is much greater, so that if somewhat less hot, the summer depression of energy is greater.

These studies do not show that I have accurately estimated the climatic effects but they do lead me to think the main points are correct and that I have not exaggerated the depressing effects of the climate in Korea. And while more careful work and observations and comparative data, are
necessary to the accurate estimation, there are a good many
general observations that confirm what I have said, and the
approximate value of the conclusions set forth.

I think I have made it clear that so far as mean month-
ly temperature is concerned there would be no great dif-
fERENCE in the effects of the climate of Korea and that of the
eastern part of the United States, but there is a difference
in favor of the United States on account of the humidity and
lack of storms and variability in the climate of Korea. It is
the feeling of most everyone when he first arrives in Korea
from the United States that the climate here is very fine, but
before many months have passed we all find it hard to keep up ambition and energy, and it is a matter of common
observation that we do not recuperate so quickly here as in
the homeland. And while comparative data are lacking, I
feel sure that the amount of sickness among the foreign res-
sidents in Korea is greater than among an equally carefully
selected group in the homeland. There are other factors
than the climate that take a considerable importance, but I
am sure that I only voice the opinion of nearly all of us,
when I say that we are not quite up to our best in Korea
and that the climate has something to do with it. I have
already referred to the number of neurasthenias in Korea,
of course the climate does not cause this disease directly, it
is the result of strain and probably overwork, but the work
is accomplished at a greater expenditure of energy to over-
come physical and psychical depression, and so the exhaus-
tion of our reserve force is more quickly accomplished than
in the homeland. I have suggested three main causes of
this reduction in human energy in Korea, humidity, lack of
the stimulus of changes,—lack of "weather,"—and possibly
the excess of light, of a great intensity.

It is not alone this running down of the energy of the
Americans who come here to live; the impression gained by
even casual observers is that the people of Korea are not a
people of great vigor. I realize that there are many factors
that would each partially account for this, but I think it is rea-
sonable to conclude that the climate is one important factor.
I think it is true that there is a difference in favor of the Korean from the northern part, when we compare the energy of the people of north and south Korea. In this, too, climate forms an important but not the only factor; religion, customs, and such, are much the same in both parts; the climate is different and the average of the people is higher in the north. We may say that more severe cold and the greater struggle required to get a living is the cause, and it may also be true that the mild climate of the southern part; with the longer summer, giving a longer growing season, and demanding less to live on causes the people of the south to relax, and I think it is probably true. For, somehow, it does not always seem to be the favorable climate that makes a strong people, it rather seems the reverse. But there is more than the psychical element involved, the equable, even tempered climate somehow reacts—or fails to cause a reaction, and the very physical tone of the body is reduced, with consequent effects on the life of the people in its every manifestation. So compared with the people of the more energy stimulating climates of the west, and even comparing parts of Korea, we see the effects of the climate.

The data of agriculture I have secured is too incomplete for more than mention, it shows that for rice-growing the farmers of Japan produce more per unit than those of Korea, but I doubt if climate has much to do with this. It is rather improved agricultural methods from better education and a more strenuous struggle to get enough to feed the denser population. As between north and south Korea, the data shows what I have referred to, the necessity for greater effort to get a living and of course, the consequent effect on the people.

I think it is true to say that the influence, power and advancement in business, arts and science of the Korean people, and the energy shown by them, do not rank as high as the climate would lead us to expect. Climate is on the whole outside of man's power to control but the factors of hampering customs, superstitions, ignorance, religion, poor sanitation, improperly balanced diet, and ages of political
repression, these are all in man's power to correct. The total influence of these factors may be greater than that of climate in determining the influence and energy of a people. This should encourage us to work to improve these factors in Korea and to expect her people to attain to higher efficiency and its resultant richer opportunities.

SUMMARY AND CONCLUSIONS.

The character of the climate of Korea is continental; modified by monsoons from the south in the summer, and from the northwest the rest of the year giving a cold winter with little precipitation, and a rainy summer. Spring and autumn are mild, beautiful transition seasons.

The difference in mean temperature of the north and south is very small in the summer, but in winter is considerable; a difference of 3.5°C (6.3°F) in summer and 22.4°C (40.3°F) in winter between Mokpo and Chukochin.

The extreme range of temperature for any one place is great; Chukochin ranges from -40.8°C to 35.5°C (-41.4° to 96°F), a range of 76.3°C (137.4°F). Fusan ranges from -14.0° to 33.6°C (6.8°F to 92.5°F), a range of 47.6°C (85.7°F). The range of Mean Temperature is only moderate; Chukochin from -20.7°C in January to 22.2°C in July, (-5.2° to 72°F), and Mokpo from 1.7°C in January to 25.7°C in August (35.1° to 78.2°F).

The variation of temperature from year to year for summer is very small; e.g., for August at Mokpo the difference between the mean temperature of the hottest and coolest years was only 2.8°C (4.0°F); but for winter the difference is more, being 7.2°C (13°F) higher for the warmest January than for the coldest January.

The variation of mean temperature from day to day is quite small, the mean daily variation for the year at Seoul being 1.8°C (3.2°F), and only 35 days a year have more than 4.0°C (7.2°F) change from the preceding day, 250 days having less than 2°C (3.6°F) variation; great sudden changes of temperature are very uncommon.
The diurnal range of temperature is small, averaging only 10.3°C (18.5°F) cooler at night than in the daytime in Seoul; the greatest range is in spring and autumn, October having 12.1°C (21.8°F). The greatest range of temperature for one day is at Chukohchin, the maximum daily range there being 25.1°C (45.2°F).

At no time is there extreme heat, but the continuous heat and high humidity of summer is very trying; there is too little change from one day to another. The steady cold of the winters makes them quite severe, but there is enough variability from day to day.

Compared with the west coast of the United States, the range of temperature is greater in Korea, but the mean annual temperature is about the same. Compared with central and eastern United States, the extremes are greater there and variability, too, is much more in the United States. Compared with Mediterranean places in the same latitude, it is slightly cooler even in summer in Korea, and the winters are much colder.

The humidity curve roughly corresponds to that of the mean temperature, highest in the summer months, in the United States there is a drop in this curve for summer. This gives constant heat with high humidity, 75% up, a very depressing combination. The winter humidity is from 50% to 70%, a favorable humidity for the temperature; the winter humidity is less than the United States from Missouri east.

There is a little rainfall from October to March, but heavy rainfall from April to September, a rainy reason in summer. The mean rainfall for the year is from 832 to 1456 mm (34-60 in).

There are frequent changes in the Barometer readings, but storm centers do not often cross Korea. Thunderstorms are rare and never severe, and other severe storms are not common.

Except in the seaports of the southwest coast strong winds are not usual; Seoul reporting only an average of
2.7 meters per second (6 miles an hour) and only 20 days a year with over 10 meters per second (20 miles an hour).

Korea is a land of much sunshine and bright skies, about 7 hours a day for every day of the year; about the same or a little more than "Sunny Italy," but less than southwestern United States.

During most of the year the intensity of the sunlight is strong, the "Black-bulb thermometer" shows strong sunlight and great radiation.

The "starch-iodide" test shows little ozone in the air, and the relatively high humidity and absence of thunderstorms indicate a low electric potential in the air.

The main factors in estimating the effect of a climate upon human efficiency are Mean Temperature month by month, variability from one day to another, Humidity, the frequency of storms, and the intensity and amount of Sunlight.

Considering only the mean temperature by months, the climate of Korea would be favorable to high efficiency, about the same as the eastern part of the United States.

The small variability—"weather"—results in a lack of stimulation from the climate; this reduces the expected efficiency considerably.

The high humidity in the summer still further reduces the efficiency; this and the lack of storms, with a low electric potential, does not give the stimulation of dry and stormy climates.

The rising temperature in the spring depresses the expected efficiency for the months, the falling temperature in the autumn is more stimulating.

The sum of these effects is to give Korea a good, but only a second-rank climate. It lacks the tonic effect of "weather," ozone, and electricity and is depressing in its steady temperature and high humidity.

The intense sunshine, great in amount, even during the rainy season, probably reacts badly upon Western people and may have a bad effects upon the Koreans themselves.
The estimated curves of human efficiency on the basis of climate as given in this paper are probably too high, failing to take full account of the depressing effects and of the lack of tonic effects.

OCCIDENTALS IN KOREA.

It will probably be worth while to add a few words regarding the effect of the climate of Korea upon the occidental residents. It is undoubtedly true that there are many breakdowns among the foreigners in Korea. I can not verify the accuracy of the statement, but a world-famed student of missions is quoted as saying that there are more breakdowns and more ill-health among the missionaries in Korea than in any mission field outside Central Africa and and such places. Even if this is exaggerated it signifies a serious condition. Why should it be so?

The "weather" in Korea is unquestionably fine, most of us boast of the "fine climate," usually with a reservation in regard to the rainy season. But I am inclined to think the rainy season a blessing in disguise for us westerners, the clouds protecting us from the intense heat and light. We boast of the climate, and yet send many invalids home. Is it not because we consider the climatic conditions so fine that we try to keep up the same rate of work we maintained in the homeland? The climate lacks the stimulus of storms and weather and electricity and ozone, and is depressing in its constant temperature and high humidity in summer with too much sunshine for blond-races; maintaining the homeland rate of energy consumption depletes the reserve forces, and either there must be slacking of work or exhaustion. Ambition to do good work in a land of great things in missionary lines, the pressure of duties that results from the successful work with too few workers, these lead the worker to overtax his reserve. Even when a period of rest is taken, the lack of stimulus causes slower and less complete recuperation. The result is that, as a whole the Occidentals in Korea look worn, newcomers and those
returning from furlough notice this, but soon join the ranks of the "weary-looking."

The obvious conclusion from this, is that we need to realize we are not in so fine a climate, not so good for energy stimulation, and to be content to lead less of the "strenuous life," to put down the conscience that tries to drive us on when the flesh is rebelling, to realize that it is not necessarily a sign of laziness that we are less inclined to exertion; and to lead a wholesome life of good hard work with rest and recreation, too. Work as we may, there will be things undone, and if we do not use our powers wisely there may be still more than there ought to be undone when we are worn out or broken down. We need to heed the voice of the weary body, when it tries to warn us to conserve what is given us, and to let well-filled years of work be our portion instead of a short period and then be worn out. Not many of us are in danger of "rusting out" and don't let us hasten the "burning out." This means less strenuosity in the days work, taking time for "sleep that knits up the ravelled sleave of care" and taking real vacations and having recreations throughout the year. There may be times when a set of tennis or a mountain climb is as religious and as much to the glory of God as attending a prayer meeting. But don't let us neglect the latter in its time. And Mission Boards should not send workers to Korea thinking this a good place for a person short on reserve energy. Korea is not a health resort for workers.

A few hints for Occidentals in Korea.

Be temperate in all things, in work and play and rest, and in eating and drinking.

Have some work or hobby or recreation that takes you out doors awhile every day.

Avoid the intense sunlight of a summer midday, the heat and light are worst from 11 to 4.

Do not wear black clothes out in the summer sun, but they may be cooler in the shade.

Pith hats and white suits are sensible; straw hats are too transparent, they need an opaque lining, and colored
undergarments may be better than white for wear in the sunshine.

Dark or colored glasses protect the eyes from the strain of intense sunlight and the glare from the soil that is highly reflecting.

Don't expose your Occidental brains to the direct sunshine, unless you have lots of black hair; bald heads are very transparent to sunlight.

Develop your coat of summer tan slowly, you will then be able to stand much more exposure.

Avoid constipation at all times, but especially in summer.

Eat plenty of fresh fruits and vegetables.

Drink plenty of good water, even at mealtimes it will do you good and your digestion will not suffer and you can stand the climate better.

It is sensible to take a noon-day rest, even if you have to work later at night. The cooler morning and evening hours are best for work.

And do not overdo your sea bathing, if you are cold and tired after it the chances are you stayed in too long or overexerted yourself; if neither of these consult your doctor.

Try to keep your house at about 15° to 18°C (60° to 65 F) in winter and be sure the air has plenty of moisture. And then sleep in open rooms.

Why not take a little vacation at the holiday season? The cold weather reduces your energy capacity, recuperate a little.

Remember that a weary nervous system is easily irritated; it takes more grace to keep sweet then, so do not walk into temptation.
CONSTITUTION AND BY-LAWS
OF THE
KOREA BRANCH
OF THE
ROYAL ASIATIC SOCIETY.

CONSTITUTION.

NAME AND OBJECT.

ART. I. The Name of the Society shall be The Korea Branch of the Royal Asiatic Society.

ART. II. The Object of the Society shall be to investigate the Arts, History, Literature and Customs of Korea and the neighbouring countries.

MEMBERSHIP.

ART. III. The Society shall consist of Honorary and Ordinary Members.

ART. IV. Honorary Members shall be admitted on special grounds to be determined in each case by the Council. They shall not be resident in Korea and they shall not be required to pay either Entrance Fee or Annual Subscription.

ART. V. Ordinary Members shall pay an Annual Subscription of two yen.

ART. VI. The Annual Subscription shall be payable in advance on the first day of January.

ART. VII. Every Member shall, subject to the provisions of sub-heading (h) of Article XIII of the By-Laws, be entitled to receive the Publications of the Society during the period of his Membership.

OFFICERS.

ART. VIII. The officers of the Society shall be:

A President;
A Vice-President;
A Corresponding Secretary;
A Recording Secretary;
A Treasurer;
A Libraian.
COUNCIL.

ART. IX. The affairs of the Society shall be managed by a Council composed of the Officers for the current year, together with three Ordinary Members.

MEETINGS.

ART. X. General Meetings of the Society and Meetings of the Council shall be held as the Council shall appoint and announce.

ART. XI. The Annual Meeting of the Society shall be held in December. At this Meeting the Council shall present its Annual Report, with shall include the Treasurer's Statement of Account.

ART. XII. Nine Members shall form a quorum at an Annual Meeting and four Members at a Council Meeting. The Chairman shall have a casting vote. At all Meetings of the Society or Council, in the absence of the President and Vice-President, a Chairman shall be elected by the Meeting.

ART. XIII. The General Meetings of the Society shall be open to the public, but persons who are not Members shall not address the Meeting except by invitation of the Chair.

ELECTIONS.

ART. XIV. All Members of the Society shall be elected by the Council. They shall be proposed at one Meeting of the Council and ballotted for at the next, one black ball in four to exclude; and their election shall be announced at the General Meeting following.

ART. XV. The Officers and other Members of the Council shall be elected by ballot at the Annual Meeting and shall hold office for one year.

ART. XVI. The Council shall fill at vacancies in its Membership that may occur between Annual Meetings.

PUBLICATION.

ART. XVII. The Publications of the Society shall contain:—(1) Such papers and notes read before the Society as the Council shall select, and an abstract of the discussion thereon. (2) The Minutes of the General Meetings, with a list of Officers and of Honorary and Ordinary Members. (3) The Reports and Accounts presented at the last Annual Meeting.

The Council shall have power to accept for publication papers or other contributions of scientific value, the technical or voluminous nature of which does not admit of their being read at a Meeting of the Society.

ART. XVIII. Authors of published papers may be supplied with extra copies at the discretion of the Council.
ART. XIX. The Council shall have power to publish in separate from papers or documents which it considers of sufficient interest or importance.

ART. XX. Papers accepted by the Council shall become the property of the Society and shall not be published without the consent of the Council.

ART. XXI. Acceptance of a paper by the Council for reading at a General Meeting of the Society does not bind the Society to its publication afterwards, but when the Council decides not to publish any paper accepted for reading, that paper shall be restored to the author without any restriction as to its subsequent use, but a copy of it shall be kept on file.

MAKING OF BYE-LAWS.

ART. XXII. The Council shall have power to make and amend By-laws for its own use and the Society’s guidance, provided that these are not inconsistent with the Constitution; and a General Meeting, by a majority vote, may suspend the operation of any By-law.

AMENDMENTS.

ART. XXIII. None of the foregoing articles of the Constitution can be amended except at a General Meeting by a vote of two-thirds of the Members present, and then only if due notice of the proposed amendment has been given at a previous General Meeting.

BY-LAWS.

GENERAL MEETINGS.

ART. I. The Session of the Society shall coincide with the Calendar Year, the Annual Meeting taking place in December.

ART. II. Ordinarily the Session of the Society shall consist of nine monthly General Meetings, of which the Annual Meeting shall be considered one, but it may include a greater or less number when ever the Council finds reason for such a change.

ART. III. The place and time of meeting shall be fixed by the Council preference being given to 4 p.m. of the second Wednesday of each month.

ART. IV. Timely notice of each General Meeting shall be sent to every Member resident in Seoul or Chemulpo.

ORDER OF BUSINESS AT GENERAL MEETINGS.

ART. V. The Order of Business at General Meetings shall be:

1. Action on the Minutes of the last Meeting.
2. Communications from the Council (Reports, etc.)
CONSTITUTION AND BY-LAWS

(3) Miscellaneous Business.
(4) The reading and discussion of Papers.

The above order shall be observed except when the Chairman shall rule otherwise.

At Annual Meetings the Order of Business shall include, in addition to the foregoing matters:

(5) The reading of the Council’s Annual Report and Treasurer’s Account and submission of these for the action of the meeting upon them.
(6) The Election of Officers and Council as directed by the Constitution.

MEETINGS OF COUNCIL.

ART. VI. The Council shall appoint its own Meetings, preference being given to the first Wednesday of each month at 4 P. M.

ART. VII. Timely notice of each Council Meeting shall be sent by post to the address of every Member of the Council, and shall contain a statement of any extraordinary business to be transacted.

ORDER OF BUSINESS AT COUNCIL MEETINGS.

ART. VIII. The Order of Business at Council Meetings shall be:

(1) Action upon the Minutes of the last Meeting.
(2) Report (a) of the Corresponding Secretary.
   (b) of the Publication Committee.
   (c) of the Treasurer.
   (d) of Librarian.
   (e) of Special Committees.
(3) The Election of new Members.
(4) Nomination of Candidates for Membership.
(5) Miscellaneous Business.
(6) Acceptance of papers to be read before the Society.
(7) Arrangement of Business for the next General Meeting.

PUBLICATION COMMITTEE.

ART. IX. There shall be a Standing Committee called the Publication Committee, composed of the Secretaries, the Librarian and any Members appointed by the Council. It shall ordinarily be presided over by the Corresponding Secretary.

It shall superintend the publication of the Transactions of the Society and the re-issue of parts out of print.

It shall report periodically to the Council and act under its authority.

It shall audit the accounts for printing the Transactions.

It shall not allow authors’ manuscripts or printers’ proofs to go out of its custody for other than the Society’s purposes.
AUDIT.

ART. X. Before the Annual Meeting of each year the Treasurer's Statement of Account shall be audited by two Members appointed by the President.

LIBRARY AND MEETING ROOM.

ART. XI. to XIV., Duties of Officers (not printed here).

ART. XV. The Society's Rooms and Library shall be in Seoul, to which may be addressed all letters and parcels not sent to the private address of the Corresponding Secretary, Treasurer or Librarian.

ART. XVI. The Library shall be open to Members for consultation during the day, the keys of the book-cases being in the possession of the Librarian or other Members of Council resident in the vicinity, and books may be borrowed on application to the Librarian.

SALE OF PUBLICATIONS.

ART. XVII. A Member may obtain at half-price, for his own use, copies of any part of the Publications.

ART. XVIII. The Publications shall be on sale by Agents approved by the Council and shall be supplied to them at a discount price fixed by the Council.
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President,

BISHOP TROLLOPE.

Vice President,

Dr. A. I. LUDLOW.

Corresponding Secretary,

HUGH MILLER.

Recording Secretary.

E. W. KOONS.

Librarian.

Dr. J. D. VANBUSKIRK.

Treasurer,

F. H. SMITH.

Councillors.

ARTHUR HYDE LAY, C. M. G., (British Consul General.)

R. S. CURTICE. (American Consul.)

F. M. BROCKMAN.
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Brown, MacLeavy J., C. M. G. ............................................... London.
Gubbins, J. H., C. M. G. .................................................... c/o Foreign Office, London.
Jodan, Sir John, K. C. M. G. ............................................... Peking, China.

ORDINARY MEMBERS.

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Shidehara, Dr. Hiroshima Higher Normal School.
Smith, Rev. F. H. Seoul.
LIST OF MEMBERS

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D. ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... 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KOREA BRANCH
OF THE
ROYAL ASIATIC SOCIETY

Volume X
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