THE
VEGETATION OF MT. FUJI
(JAPAN)

BY
B. HAYATA, Dr. Sc.
Ex Libris
The Pennsylvania Horticultural Society
Pl. L. View of Mt. Fuji, seen from Omiya; Larix, evergreen conifer, deciduous broad-leaved trees, and prairie, regions are distinctly visible.

(Sketched from nature by the author in April 1903.)
THE

VEGETATION OF MT. FUJI

(JAPAN)
富士植物論

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The Vegetation of Mt. Fuji

With a Complete List of Plants found on the Mountain and a Botanical Map showing their Distribution

By

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With eight plates, a coloured botanical map and thirty five figures in the text.

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Distant view of Mt. Fuji, seen from the Wada-pass; the foreground shows a forest of *Pinus densiflora*, SIEB. et ZUCC.

(From the Atlas of Japanese Vegetation, by permission of Prof. M. MIYOSHI.)
In
Memory
of My Mother

Who
devoted Her Life to the Education of Her Three Sons and
by Whose Encouragement I was led to devote My
Own Life to the Study of Botany.
我等三人の兄弟を育て常に志を堅ふべきを己に訓へ給ひし
亡き母君に報恩の紀念として此書を奉る

文

蔵
INTRODUCTION.

On the shore of the Pacific, towering to a height of more than twelve thousand feet, stands Mt. Fuji, symmetrical in shape and rich in vegetation, a fitting emblem of the Japanese nation. For several years past, I have taken a special interest in the botany of this beautiful mountain. The undulating prairie covering the gentle slope at the base, the dense forest stretching up to the middle, and higher up the dark growth of firs, are all so interesting and impressive that I have never tired of visiting it in every season of the year; observing how the vegetation changes as one makes the circuit of the mountain, or how the forest is differentiated according to height as one climbs to the peak. In summer, I have spent my vacations in the study of the flora, examining species after species, when all the prairie below is decorated with a great variety of flowers, and the broad leaved forest spreads out its foliage to the sunshine. But in winter, when the snow covers the peak and throws the dark forest of ever-green conifers into sharp relief, my attention has been turned to the investigation of the plant formations zone after zone, each conforming to a contour line which is in itself circular. No other mountain in the Empire shows so regular a vegetation.

In my first visit to this beautiful mountain some five years ago, when I was travelling around the gentle slope of the truncated cone, my attention was at once attracted to the dif-
ference between the forest zones on the different sides of the mountain. Then the question immediately arose what has caused this difference almost as symmetrical as Mt. Fuji itself?

The vegetation, as one may see from the base of the mountain, is roughly divided into six zones according to the altitude, viz. the prairie, the region of broad leaved trees, the ever-green conifer belt, the region of Larix, the stunted shrubbery, and the alpine stretches. But more broadly speaking, when only the sides of the mountain are considered, the regions of vegetation may be divided into two — northern and southern. On the southern side of the tree region, deciduous broad leaved trees predominate, but on the north the ever-green needle leaved trees are characteristic. The cause of this difference is an interesting subject for investigation.

In the course of my study, I have found that the different aspects of the tree regions are explainable by the differences of climate and soil according to altitude and exposure. In this paper, I have endeavoured also to enumerate all the plants found on the mountain and to arrange them in order according to regions, as explained in the map annexed.

In conclusion, I must express my hearty thanks to Prof. J. Matsumura, by whose special permission this work has been carried out. I am also indebted to Prof. M. Miyoshi for his kindness to give me the privilege of reproducing some figures from his "Atlas of Japanese Vegetation"; to Dr. Y. Shiozawa by whose kindness I was able to secure all the data relating to the alternation of the forest regions; and to Mr. T. Makino who has kindly assisted me in determining the collections that I have made on the mountain. Nor should I forget to mention my obligations to Dr. T. Okada who has liberally furnished me with all the meteorological data relating to the peak.

June 1907.
Fig. 1. Sketch-map of Mt. Fuji and its neighbouring peaks.
--- Provincial boundaries.

I. PHYSIOGRAPHY.

As vegetation has a close relation to the physiography of its locality, we must before going into details pause to consider the geology and climate of Fujiyama. Further, in order to study the relation of the flora of one mountain to that of another, we must necessarily know the geological relation between them. This chapter, therefore, will be devoted to the consideration of geology of this mountain and the neighbouring ranges, so far as is needful for investigating this subject.

Mt. Fuji, rising from the broad plain between the Provinces of Kai and Suruga, is a well defined elevation. It is
situated so that the meridian of 138° 44' East of Greenwich, and the parallel of 35° 21' North intersect near its summit. Attaining the height of 3778m. (approximately) above the sea level, this truncated cone adds a most graceful feature to the landscape of the Pacific coast. Its foot covers an extensive area, measuring 45 km. from N. to S. and 30 km. from E. to W. Combined with the elevations of the Myōkō volcanic group on the north, Mt. Yatsugatake in the middle, and far on the south Mts. Amagi and Izu-Shichitō,* it forms the Fuji volcanic chain, which divides the main-island into two parts. Among the volcanoes of this chain, Fujiyama, being the one formed most recently probably in the diluvial age, is thought to have the most recent vegetation.

It has Mt. Ataka at its very base, and Mt. Amagi some eighty miles to the south, while Mt. Kinbusen is on the north at a distance of about eighty miles. Further on, a hundred miles to the north-west, is Mt. Yatsugatake with Mt. Komagatake a little nearer, and Mt. Akaishi on the west at a distance of about eighty miles. All these mountains are supposed to have been already extinct, while Mt. Fuji was still active. And therefore, it is highly probable that all these elevations in the vicinity were crowned with rich vegetation while the young volcano was still bare of organic growth.

So much for the geology of the elevations in the vicinity. Turning now to the mountain itself, it has five lakes at its base, viz:—Yamanaka, Kawaguchi, Nishi, Shōji and Motosu. They are said with great probability to have been originally a semicircular lake skirting the base of the mountain. This lake was afterwards divided into five by the diminution of its water, and also by the intrusion of lava that flows from the volcano. These lakes give a great variety to the otherwise monotonous scenery of the basal slope, and especially on the north-western flank

* Seven islets near Prov. Izu.
where an extensive forest is found, owing to the underground water afforded by the lakes.

Although the mountain is entirely in a dormant stage, there is still observed some heat, 50°C in the rocks on the top,—an indication that the volcano has but recently ceased to be active. The inclination of the flank near the top is rather steep, measuring 34°-32°, then gradually becoming a more and more gentle declivity of 25°-17°, and at last most gently sloping league after league almost to a level. The shoulders of this volcanic cone are in all respects quite symmetrical, and its general outline is comparable to a logarithmic curve, so uniformly do the flanks slope in all directions.

The flanks are, as has been stated by Dr. T. Hirabayashi, all covered with lava broken into jaggy blocks, or invested with volcanic ashes. Generally speaking, the mountain is covered with lavas and cinders from the peak down to an elevation of 1500m., but the basal portion below is covered with tufas, sand and pebbles. It must be admitted however that there is a little local difference on the different sides,—for example, on the N. W. side the Aogigahara-lava occupies a very extensive area reaching down to an elevation of 1000m., while on the east the volcanic ashes and pebbles cover a broad area at the base and reach up as high as to elevation of 2500m.

Lavas are necessarily accompanied by scoriae of various kinds. I may mention here that lava, when it consists of jaggy blocks, can absorb much water in its substance and is more likely to hold water upon its surface. When lava is thus broken into jaggy blocks, it is all the better for retaining water; because from a smooth plane surface water will run off rapidly; but with a rough surface, it has more chances of being retained. Not only has rough ground more power to hold water for the plants, but also it supplies the young seedlings with shelter sufficient to help their growth. But, if the lava consists of scoria, the case is a little different. Scoria is hard and glassy,
and it is rather difficult for plants to fasten their roots upon it even when there is a plentiful supply of water. Volcanic ashes or tufas can hold a considerable quantity of water; but an area covered with tufas is necessarily plane and smooth, and here in a heavy rainfall, the water is likely to run off from its surface. What makes the matter worse for plant-seedlings is that the area affords no place where plants can fasten their roots and is too flat to have any holes or shady places for the young plants. When strong and dry winds prevail, such ground at once loses all moisture and the plants find it difficult to grow. In this sense, in a surface covered with jagged blocks of lava, the plants can best find their rooting.

After stating so much, let us proceed to the consideration of the lavas of Mt. Fuji. According to Dr. T. Hirabayashi, some of the lavas belong to the eruption after the historical age, and therefore we are able to estimate their ages together with those of the vegetation upon them. There are seven streams of lava, each differing from the other, implying pre-historical and post-historical periods. They are as follows:—

1) the Ōsawa, 2) Mishima, 3) Ōmiya, 4) Karasuishi, 5) Yenkyō, 6) Aogigahara, and 7) Höyé streams. The first four are pre-historical and the last three post-historical. All the lavas of this volcano are basic. The Yenkyō lava is said to have erupted in the year 880, the Aogigahara in the year 955, and the Höyé lava in the year 1707.

Of all these lavas, the Aogigahara which stretches over the N.W. flank is the most porous and capable of supporting vegetation.* The other lavas are more or less dense and compact. The Höyé lava consists of ashes or small particles of lava blocks, and is not fitted for plant growth. We, therefore, see the richest vegetation on the Aogigahara side and the poorest on the Höyé side.

* The ground covered with this lava is especially fitted for the growth of conifers.
Pl. II. View of Mt. Fuji from Ukishima-numa. (Ukishima-swamp.)

The conifer region is seen quite dark below the treeless region clad with snow, and the region of deciduous broad-leaved forests is seen less dark below the conifer region. (After a photograph; a little brush is put in by the author, in order to show the plant region's clear.)
As we have stated above, the distribution of the lava has a close relation to the development of the forest. Independent of this matter, however, there must be certain differences of plant...
formation caused by climate. The next chapter is, therefore, devoted to the climate of the mountain.

II. CLIMATE.

As Mt. Fuji lies in the monsoon region, it has a heavy precipitation in the summer, with clear weather in the winter. Accordingly, its vegetation up to the height of 1500m. is mostly summer green forest formation. Above that line, conifers are found predominating over deciduous trees. In this chapter, we shall try to examine the climatic character of the different sides of the mountain. We have five meteorological stations, varying in altitudes from 100m. to 1000m., and located on different sides of Mt. Fuji. For the present investigation, it is necessary to take into account only the observations made at the altitude of about 1000m.; for the forest formation begins at that elevation. The five stations are not all in the tree regions, but it is possible for us to calculate the missing data from the known readings made at the base stations.

The localities of the five stations are shown in the accompanying sketch. They are as follows: 1) the Shiraito station, situated S.W. of the peak; 2) the Shōji station, N.W.; 3) the Ōmiya station, due S.; 4) the Goten station, S.E.; 5) the Nakano* station almost due E.

The climatic elements which must be taken into consideration in investigating plant formation are: 1) rainfall; 2) temperature; 3) humidity; 4) sunshine; 5) wind-direction. Let us consider them one by one.

1) Rainfall. It is a well known fact that other things being equal, the greater the rainfall the better for the vegetation. The following table shows the average rainfall for five years observed at the five stations.

* Nakano is located very near Yamanaka in the accompanying sketch.
Tab. I. Containing the latitudes, longitudes and altitudes of the stations, the years of the observations, and the mean annual and monthly rainfalls (in millimeters), for the five stations.

It is very desirable to know the precipitation of the 1000m. altitude, as the forest regions begin at that point. We all
know that the rainfall, in the case of a mountain, increases up to the altitude of 1000m. and then decreases above that line. We can approximately calculate the rainfall of a flank of a mountain at any altitude, if we but know the rate of increase of rainfall for each 100m. The stations at Shiraito and Ōmiya are almost in a line from the top of the mountain. And therefore the difference of rainfall observed at these two stations will tell us the rate of increase of rainfall due to the altitude. The rate of increase in every 100m. thus calculated is 72mm. in annual mean of rainfall. Applying this rate to each station, we calculate the annual mean rainfall of the five directions at an altitude of 1000m., which amounts are shown in the following table.

<table>
<thead>
<tr>
<th></th>
<th>annual mean rainfall at the altitude of 1000m. on the Shiraito side.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2936 mm.</td>
</tr>
<tr>
<td>&quot;</td>
<td>Ōmiya side.</td>
</tr>
<tr>
<td>&quot;</td>
<td>2889 &quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Goten side.</td>
</tr>
<tr>
<td>&quot;</td>
<td>2596 &quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Nakano side.</td>
</tr>
<tr>
<td>&quot;</td>
<td>2942 &quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Shōji side.</td>
</tr>
<tr>
<td>&quot;</td>
<td>2534 &quot;</td>
</tr>
</tbody>
</table>

In this table we see the Nakano side leads in the amount of rainfall, next come the Shiraito and Ōmiya sides, while the Goten and Shōji sides have the least. This climatic character, however, seems to have but slight significance in explaining the present vegetation; for vegetation does not depend so much upon rainfall, as it does upon the soil, ground water, and humidity, which will be considered later.

However great the rainfall, if it comes all at once and runs away very rapidly, it will favour growth far less than frequent light rains. So the frequency of the rains should be taken into consideration.
Tab. III.

<table>
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<tbody>
<tr>
<td>Shiraito</td>
<td>6</td>
<td>7</td>
<td>14</td>
<td>15</td>
<td>13</td>
<td>16</td>
<td>11</td>
<td>13</td>
<td>14</td>
<td>8</td>
<td>6</td>
<td>136</td>
<td></td>
</tr>
<tr>
<td>Ōmiya</td>
<td>5</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>5</td>
<td>10</td>
<td>11</td>
<td>6</td>
<td>4</td>
<td>111</td>
<td></td>
</tr>
<tr>
<td>Goten</td>
<td>5</td>
<td>5</td>
<td>14</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>6</td>
<td>11</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>Nakano</td>
<td>7</td>
<td>5</td>
<td>13</td>
<td>13</td>
<td>15</td>
<td>15</td>
<td>11</td>
<td>13</td>
<td>15</td>
<td>7</td>
<td>7</td>
<td>134</td>
<td></td>
</tr>
<tr>
<td>Shōji</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>14</td>
<td>14</td>
<td>17</td>
<td>16</td>
<td>13</td>
<td>14</td>
<td>8</td>
<td>7</td>
<td>141</td>
<td></td>
</tr>
</tbody>
</table>

Tab. III. Containing the average number of rainy days in each month, for the five years from 1901 to 1905 inclusive.

The figures of this table, being the result of observations made at different altitudes, do not give us any fair idea of the number of rainy days at the 1000m. altitude. We see, however, that these observations throw some light upon the investigation of the present plant-formation. The number of rainy days for Shiraito and Shōji are the greatest; hence they have the most abundant vegetation. Moreover, it may be urged that the Shiraito must have the most days of rain, for this station, notwithstanding its low elevation, has more rainy days than the Nakano station which lies almost at the altitude known to have the maximum precipitation. As will be shown afterwards, the most abundant growth of deciduous trees is found on the Shiraito side.

2) Temperature. The following table will give us the readings of the thermometers at the five stations. Here, however, we must consider the temperature at the altitude of 1000m., which temperature can be calculated from the known readings.
Tab. IV.

<table>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiraito</td>
<td>1900-1904</td>
<td>6.3</td>
<td>6.3</td>
<td>9.3</td>
<td>13.9</td>
<td>17.9</td>
<td>21.0</td>
<td>23.4</td>
<td>26.5</td>
<td>23.4</td>
<td>18.3</td>
<td>12.9</td>
<td>8.4</td>
<td>15.6</td>
</tr>
<tr>
<td>Ōmiya</td>
<td>1899-1904</td>
<td>6.1</td>
<td>6.5</td>
<td>9.9</td>
<td>14.6</td>
<td>18.6</td>
<td>21.9</td>
<td>24.5</td>
<td>26.8</td>
<td>24.3</td>
<td>18.7</td>
<td>13.1</td>
<td>8.5</td>
<td>16.1</td>
</tr>
<tr>
<td>Goten.</td>
<td>1900-1904</td>
<td>3.2</td>
<td>3.9</td>
<td>7.4</td>
<td>13.2</td>
<td>16.5</td>
<td>20.7</td>
<td>22.6</td>
<td>26.0</td>
<td>23.3</td>
<td>16.9</td>
<td>11.1</td>
<td>6.0</td>
<td>14.2</td>
</tr>
<tr>
<td>Nakano</td>
<td>1900-1905</td>
<td>0.9</td>
<td>0.3</td>
<td>4.1</td>
<td>9.8</td>
<td>13.6</td>
<td>18.1</td>
<td>20.9</td>
<td>22.3</td>
<td>19.3</td>
<td>13.5</td>
<td>8.4</td>
<td>3.3</td>
<td>11.2</td>
</tr>
<tr>
<td>Ōshōji</td>
<td>1900-1905</td>
<td>0.3</td>
<td>0.6</td>
<td>4.4</td>
<td>9.8</td>
<td>13.8</td>
<td>18.3</td>
<td>21.2</td>
<td>22.3</td>
<td>20.0</td>
<td>13.6</td>
<td>7.6</td>
<td>3.0</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Tab. IV. Containing the mean annual and monthly temperature (°C.) for five stations; observations made daily at 10 A.M.

From this table, we can calculate approximately the temperature at the height of 1000m. on the respective sides represented by the five stations. In making the calculation, it is necessary to know the gradient of temperature on Mt. Fuji; but owing to the scarcity of data, we are not able to obtain any reliable value of the gradient on the mountain. Fortunately, however, the gradient of temperature up to the 1000m. elevation is known with great approximity from observations made for long years on Mt. Tsukuba. As both mountains are situated on the Pacific coast, and stand near each other, the results obtained for Tsukuba will hold good for the basal portion of Mt. Fuji.

The following figures obtained by Dr. T. OKADA are given as the gradient of air temperature per 100m. on Mt. Tsukuba.

Tab. V.

<table>
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</thead>
<tbody>
<tr>
<td>Gradient</td>
<td>0.49</td>
<td>0.52</td>
<td>0.55</td>
<td>0.60</td>
<td>0.60</td>
<td>0.57</td>
<td>0.57</td>
<td>0.57</td>
<td>0.55</td>
<td>0.43</td>
<td>0.43</td>
<td>0.30</td>
<td>0.54</td>
</tr>
</tbody>
</table>
From Tables IV. and V., we obtain the following table showing the mean temperature for month and year at the 1000m. altitude on the respective sides of the mountain.

Tab. VI.

<table>
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<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1000m. altitude on the Shiraito side.</td>
<td>3.8</td>
<td>3.6</td>
<td>6.5</td>
<td>10.8</td>
<td>14.4</td>
<td>18.1</td>
<td>20.5</td>
<td>23.6</td>
<td>20.6</td>
<td>15.5</td>
<td>10.7</td>
<td>6.2</td>
<td>12.8</td>
</tr>
<tr>
<td>&quot; &quot; Ōmiya side.</td>
<td>1.9</td>
<td>2.1</td>
<td>5.1</td>
<td>9.5</td>
<td>13.5</td>
<td>17.1</td>
<td>19.7</td>
<td>22.0</td>
<td>19.5</td>
<td>13.9</td>
<td>4.3</td>
<td>4.8</td>
<td>11.5</td>
</tr>
<tr>
<td>&quot; &quot; Goten side.</td>
<td>0.5</td>
<td>1.1</td>
<td>4.4</td>
<td>9.9</td>
<td>13.2</td>
<td>17.6</td>
<td>19.5</td>
<td>22.9</td>
<td>20.3</td>
<td>13.9</td>
<td>8.8</td>
<td>3.7</td>
<td>11.2</td>
</tr>
<tr>
<td>&quot; &quot; Nakano side.</td>
<td>0.9</td>
<td>0.3</td>
<td>4.1</td>
<td>9.8</td>
<td>13.6</td>
<td>18.1</td>
<td>20.9</td>
<td>22.3</td>
<td>19.3</td>
<td>13.5</td>
<td>8.4</td>
<td>3.3</td>
<td>11.2</td>
</tr>
<tr>
<td>&quot; &quot; Shōji side.</td>
<td>0.3</td>
<td>0.3</td>
<td>4.1</td>
<td>9.4</td>
<td>13.4</td>
<td>17.9</td>
<td>20.8</td>
<td>21.9</td>
<td>19.7</td>
<td>13.3</td>
<td>7.3</td>
<td>2.7</td>
<td>11.0</td>
</tr>
</tbody>
</table>

On looking at this table, we see that the temperature is the highest on the Shiraito side and next highest on the Ōmiya side. Other things being equal, the higher the temperature, the better plants grow. This is clearly shown in the plant formation of Mt. Fuji. On the Shiraito side, the forest is the richest, and the Ōmiya side comes next. On the Shōji side, the temperature is the lowest, but the forest is there favoured by the underground water due to the adjacent lake, and still more by the porous lava which covers all the ground*. On the Gotemba side, the temperature is comparatively high; but this advantage being offset by the poor soil, we have here the poorest vegetation.

3) **Humidity.** This most subtle thing plays an important rôle in plant formation. To my regret, we have no observations

* The case that the forest of conifers is favoured by porous lavas which cover the ground is everywhere met with in Japan. In Mt. Maccarinupri, we find conifer-forests flourish on lavas, while deciduous trees, on the ground covered by tufas and ashes.
of humidity at the basal stations. We have, however, one station at Numadzu on the base of the southern flank and another station at Kōfu on the north, where observations on humidity are made. The observations made at these two stations will answer for the present investigation. We may approximately calculate the absolute humidity at the altitude of 1000m. on the northern flank of Mt. Fuji from that of the Kōfu station; and the absolute humidity of the southern flank, from that of the Numadzu station. HANN'S formula will answer well for this purpose.

Formula I. \[ e_k = e_0 10^{-\frac{h}{6500}} \] \[ \log e_k = \log e_0 - \frac{h}{6500} \]

where \( e_k \) denotes the vapour tension at any altitude and \( e_0 \) denotes the known vapour tension observed at the base station of a mountain; \( h \) represents the difference between the height of a point and that of the base station, measured in meters.

Let us require the tension at the altitude of 1000m. on both flanks, north and south. The following table shows the mean annual and monthly temperatures for the two stations; the observations cover the space of five years, 1896–1900 inclusive, and the readings are made six times a day.

Tab. VII. (Temperature.)

<table>
<thead>
<tr>
<th>Months</th>
<th>Stations</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Ann'l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kōfu</td>
<td></td>
<td>1.1</td>
<td>2.5</td>
<td>6.1</td>
<td>12.4</td>
<td>16.1</td>
<td>20.8</td>
<td>24.5</td>
<td>25.7</td>
<td>21.3</td>
<td>14.3</td>
<td>9.1</td>
<td>3.5</td>
<td>13.2</td>
</tr>
<tr>
<td>Numadzu</td>
<td></td>
<td>5.3</td>
<td>6.7</td>
<td>8.3</td>
<td>13.5</td>
<td>17.8</td>
<td>20.7</td>
<td>24.4</td>
<td>26.2</td>
<td>22.4</td>
<td>16.7</td>
<td>12.3</td>
<td>7.7</td>
<td>15.1</td>
</tr>
</tbody>
</table>

Altitude of Kōfu = 269m. \( h \) of the northern flank = 1000m. − 269m = 731m.

Calc. I. Altitude of Numadzu = 10m. \( h \) of the southern flank = 1000m. − 10m = 990m.

From Tables VII., V. and Calc. I., we get the following table for the mean monthly and annual temperatures at the altitude of 1000m. on both northern and southern flanks.
Tab. VIII. (Temperature.)

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Altitude of 1000m. north.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9.3</td>
</tr>
<tr>
<td></td>
<td>-2.48</td>
<td>-1.3</td>
<td>2.1</td>
<td>8.1</td>
<td>12.8</td>
<td>17.2</td>
<td>20.4</td>
<td>21.6</td>
<td>17.3</td>
<td>10.4</td>
<td>6.0</td>
<td>0.4</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Altitude of 1000m. south.</td>
<td>0.4</td>
<td>1.6</td>
<td>2.8</td>
<td>7.6</td>
<td>11.9</td>
<td>15.1</td>
<td>18.8</td>
<td>20.5</td>
<td>16.9</td>
<td>11.2</td>
<td>8.0</td>
<td>3.4</td>
<td>9.7</td>
</tr>
</tbody>
</table>

The maximum tensions \( E \) of the above temperatures are as follows:

Tab. IX. (Maximum tension = \( E \).)

<table>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( E ) at the altitude of 1000m. on the north.</td>
<td>3.81</td>
<td>4.16</td>
<td>5.31</td>
<td>8.05</td>
<td>10.99</td>
<td>14.12</td>
<td>17.30</td>
<td>19.16</td>
<td>14.67</td>
<td>9.39</td>
<td>6.97</td>
<td>4.70</td>
<td>8.72</td>
</tr>
<tr>
<td></td>
<td>( E ) at the altitude of 1000m. on the south.</td>
<td>4.70</td>
<td>5.12</td>
<td>5.58</td>
<td>7.78</td>
<td>10.36</td>
<td>12.76</td>
<td>16.12</td>
<td>17.91</td>
<td>14.30</td>
<td>9.9</td>
<td>7.99</td>
<td>5.82</td>
<td>8.96</td>
</tr>
</tbody>
</table>

The vapour tensions \( e_0 \) at the two basal stations are shown in the following table. The observations cover the space of five years, 1896–1900 inclusive; and the figures are the mean of the readings made six times a day.

Tab. X. (Vapour tension \( e_0 \).)

<table>
<thead>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kōfu</td>
<td>3.5</td>
<td>3.74</td>
<td>4.78</td>
<td>7.82</td>
<td>10.83</td>
<td>13.32</td>
<td>17.88</td>
<td>19.7</td>
<td>15.92</td>
<td>9.8</td>
<td>6.68</td>
<td>4.2</td>
<td>9.84</td>
</tr>
</tbody>
</table>

From Calc. I., Tab. X. and Formula I., we get the following table showing the vapour tensions \( e_h \) at the altitude of 1000m. on both northern and southern flanks.
Tab. XI. (Vapour tension \( e_h \))

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>altitude of 1000m. on the north.</td>
<td>2.7</td>
<td>2.9</td>
<td>3.7</td>
<td>6.0</td>
<td>8.0</td>
<td>10.3</td>
<td>13.8</td>
<td>21.5</td>
<td>20.12</td>
<td>22.7</td>
<td>7.56</td>
<td>5.17</td>
<td>3.24</td>
</tr>
<tr>
<td>altitude of 1000m. on the south.</td>
<td>3.1</td>
<td>3.2</td>
<td>4.0</td>
<td>6.1</td>
<td>8.0</td>
<td>10.0</td>
<td>12.8</td>
<td>14.1</td>
<td>16.4</td>
<td>7.5</td>
<td>5.6</td>
<td>3.7</td>
<td>7.4</td>
</tr>
</tbody>
</table>

It is not vapour tension that plays an important part in the formation of forest; but it is saturation-deficit which is necessary and is the main cause in making forest.

From Tables IX and XI, we get the following table showing saturation-deficit \( E - e_h \) on both flanks.

Tab. XII. (Saturation-deficit \( E - e_h \))

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1000m. altitude on the north.</td>
<td>1.01</td>
<td>1.26</td>
<td>1.61</td>
<td>2.05</td>
<td>2.99</td>
<td>3.82</td>
<td>3.39</td>
<td>3.96</td>
<td>2.4</td>
<td>1.83</td>
<td>1.8</td>
<td>1.46</td>
<td>1.16</td>
</tr>
<tr>
<td>1000m. altitude on the south.</td>
<td>1.6</td>
<td>1.9</td>
<td>1.58</td>
<td>1.68</td>
<td>2.36</td>
<td>2.76</td>
<td>3.32</td>
<td>3.81</td>
<td>2.9</td>
<td>2.4</td>
<td>2.39</td>
<td>2.12</td>
<td>1.56</td>
</tr>
</tbody>
</table>

Here we see in this table that, in January, February, September, October, November and December, i.e. in the so-called non-growing season, the southern flank is much drier than the northern; and contrariwise in the spring and summer, i.e. in the growing season. This difference of humidity clearly shows the difference of the vegetation of the two sides.
We have previously stated that the vegetation-regions of Mt. Fuji may be broadly divided into two according to side,—northern and southern. On the north, the ever-green conifers predominate, while on the south there is a most luxuriant growth of deciduous, broad-leaved trees. On the south, the air is dry in the winter, that does no harm to the deciduous trees. In the so-called growing season, the leaves of deciduous trees all come out, and it is rather dangerous for the trees when the air is dry, for they have such a broad surface of leaves for evaporation. In the winter, they have no leaves and, therefore, no surface for evaporation. In short, deciduous trees do not require moist air in the winter, but do in the spring and summer. In other words, deciduous trees have no fear of being dried up in the winter, for they have no leaves for transpiration; but in the summer when all their leaves are out, they are in great danger of losing too much water, if the air is dry. Therefore, deciduous trees can do well in a region where the air is drier in the
winter, and is moister in the summer. This, we see in Tab. XII., is the condition of the southern flank of Mt. Fuji.

In Tab. XII., we also see that, in the so-called non-growing season, i.e. in the winter, the air on the north side is rather humid, but in the spring and summer the air is comparatively dry. The ever-green conifers are as susceptible to a code of humidity in winter as in summer. But in the growing season, they have comparatively a smaller leaf-area for evaporation than the deciduous broad-leaved trees. They are, therefore, less in danger than the deciduous trees if the air is dry during the growing season. In short, the conifers can stand comparatively dry air in the growing season, but they can not stand it in winter. Therefore, the conifers will do well in a region where the air is comparatively moist in winter, and dry in spring and summer. This, as we see in Tab. XII., is the case with the region of the northern flank of Mt. Fuji.

As we have already stated, the temperature and rainfall can give but a faint explanation of the difference of the features of the forest-regions on the different sides. But a careful examination of the effects of humidity will prove it a most important reason for the differences found on the various flanks.

4) Sunshine. Lastly we shall consider the difference of the duration of sunshine on the different sides. The following table shows the possible duration of sunshine on both sides, granting that the observations at the Kofu station may answer for those of the northern side of Mt. Fuji, and the observations at the Numadzu station, those of the southern side of the mountain.

Tab. XIII.

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kofu, northern side.</td>
<td>311</td>
<td>305</td>
<td>370</td>
<td>392</td>
<td>435</td>
<td>434</td>
<td>442</td>
<td>416</td>
<td>370</td>
<td>348</td>
<td>308</td>
<td>301</td>
<td>4432</td>
</tr>
<tr>
<td>Numadzu, southern side.</td>
<td>312</td>
<td>306</td>
<td>370</td>
<td>391</td>
<td>433</td>
<td>432</td>
<td>440</td>
<td>415</td>
<td>370</td>
<td>346</td>
<td>309</td>
<td>304</td>
<td>4431</td>
</tr>
</tbody>
</table>
The following table shows the actual duration of sunshine at the two stations.

Tab. XIV.

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kōfu, northern side.</td>
<td>180</td>
<td>202</td>
<td>202</td>
<td>185</td>
<td>210</td>
<td>195</td>
<td>154</td>
<td>222</td>
<td>171</td>
<td>155</td>
<td>173</td>
<td>198</td>
<td>2246</td>
</tr>
<tr>
<td>Numadzu, southern side.</td>
<td>185</td>
<td>187</td>
<td>186</td>
<td>190</td>
<td>226</td>
<td>192</td>
<td>191</td>
<td>235</td>
<td>180</td>
<td>172</td>
<td>181</td>
<td>203</td>
<td>2306</td>
</tr>
</tbody>
</table>

Ratios of the possible duration to actual duration on both sides are shown in the following table.

Tab. XV.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kōfu, northern side.</td>
<td>58</td>
<td>66</td>
<td>55</td>
<td>47</td>
<td>49</td>
<td>45</td>
<td>35</td>
<td>53</td>
<td>46</td>
<td>45</td>
<td>56</td>
<td>66</td>
<td>52</td>
</tr>
<tr>
<td>Numadzu, southern side.</td>
<td>59</td>
<td>61</td>
<td>50</td>
<td>48</td>
<td>48</td>
<td>44</td>
<td>45</td>
<td>56</td>
<td>48</td>
<td>49</td>
<td>59</td>
<td>67</td>
<td>53</td>
</tr>
</tbody>
</table>

Upon considering the foregoing tables we find that through the year the weather is better on the southern side than on the northern. But it may be mentioned that in February and March the weather is better on the northern side than on the southern. This fact will at least favour conifers which have ever-green leaves even in the cold winter and have power to do starch-building even then; but will not benefit deciduous trees which have no leaves to enjoy the sunshine.

4) Wind-direction. It is true that the wind plays a somewhat important part in making forest. The fact is the gentler the wind the better for the forest. So, the velocity of the wind is the important point for us. We have, however, no information about the wind velocity at the base stations of the mountain.
Setting it aside, therefore, let us proceed to examine the direction of the wind.

As the wind is a means of conveying plant seeds to a distance, the discussion of the wind-direction will throw some light upon the questions whence and how plants were first brought to this volcano.

The following table shows the wind-direction at the different stations.

Tab. XVI.

<table>
<thead>
<tr>
<th>Stations</th>
<th>Months</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Ann'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiraito</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>Omiya</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Goten</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Nakano</td>
<td></td>
<td>W</td>
<td>W</td>
<td>SW</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>SW</td>
<td>SW</td>
</tr>
<tr>
<td>Shōji</td>
<td></td>
<td>N</td>
<td>N</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>SE</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>N</td>
</tr>
</tbody>
</table>

Tab. XVI. Showing the wind-directions at the different stations.

As the mountain lies in the so-called monsoon region, the north wind prevails in the winter and the south wind in the summer. But the wind at the region under consideration is somewhat changed owing to the high mountain. Thus the prevailing wind throughout the year is the south wind.

As we have previously stated, the mountain must have been entirely bare, until it entered the extinct stage. After having become ready to give plants their stands, it must have received first some inhabitants from the neighbouring mountains. I have come on this occasion to consider that the wind is the only means of conveying plant-seeds to this mountain. The wind must,
therefore, play an important rôle in making up the flora of Mt. Fuji.

Here we must not forget to mention that in the middle layer of the air the constant wind is that from the south-west. In the case of Mt. Fuji, therefore, at the 2500m. elevation, the south-westerly wind prevails. It is only from southern mountains that the peak could have received alpine plants, and looking on the map we see that there is no high mountain on the south. In other words, there is no high elevation on the south to contribute alpine elements to Mt. Fuji’s vegetation. This fact must go far towards explaining why the mountain is so poor in the alpine elements, as will be seen in the list. Such a plant as *pinus pumila* so common in the alpine regions in Japan is entirely wanting on this mountain.

III. GENERAL ASPECT OF THE VEGETATION.

In the preceding chapters, we have considered the physiography, geology and climate, of Mt. Fuji as far as is necessary for the discussion of the plant formation. In this chapter, we shall try to dwell upon the formation in general,—not to investigate the vegetation zone after zone, but to take a general glance over all the different parts of the mountain. In order to attain this end, it will be best to divide the mountain into four parts as shown in the accompanying sketch.

First, we shall consider these parts one by one; next we shall combine all parts into one in order to gain a general conception of the vegetation on the whole. Let us take Part I. for the first discussion.

a) Plant-formation in Part I.

On glancing over the volcano from the Ōmiya plain, at a distance of five miles from the base, we shall have a clear view of the southern flank with its abundant growth. The
arrangement of the vegetation according to the height is seen most clearly on this side.

Fig. 4. Sketch-map of Mt. Fuji; plant regions are divided to four parts.

As is shown in Plate I., the plant regions of the mountain are displayed very clearly by the different coloration of the formations; the truncated top, clad with pure white snow, or sometimes crowned with clouds; the hazy dark green region of the conifer-forest in the middle; the light red zone of the deciduous forest a little lower; then light brown to the base, and mile after mile of prairie-formation. The alpine stretches, shrubbery growth, and Larix-formation, which lie above the conifer-forest, are but faintly seen. The deciduous forest enjoys the most luxuriant growth on this side.

As there is sufficient heat and considerable rainfall on this side, cultivation is carried on here and there even to the edge of the deciduous growth. The prairie-land on this side is said to have been formerly clad with a dense forest. It is known from the re-
cords that in former times clearings were made here, and more emphatically is this told by the roots or stumps buried in the soil.

Some portions in this part have been accurately surveyed by the Bureau of the Imperial Preserves for the first process of the afforestation now being carried out here. Through the kindness of Dr. Y. Shiozawa, expert of the Bureau, I was able to secure all the data with which I express numerically the degrees of the alternation of the forest-regions. The surveyed portions were divided into a number of parts, and the deciduous trees and conifers contained in some parts marked with asterisks were actually counted. The supply of timber contained in those parts is finally mentioned. This supply will approximately show the density of the forests.

The following tables show the relative frequency of both deciduous and coniferous trees in each part. The positions and the altitudes of the parts are given in the accompanying plate.

Tab. XVII.

Sect. I.

Tab. XVII. Showing the relative frequency of both deciduous and coniferous trees in Sect. I in the accompanying plate.

<table>
<thead>
<tr>
<th>No.</th>
<th>Species</th>
<th>Larix</th>
<th>Picea and Abies</th>
<th>Deciduous broad-leaved tree</th>
<th>Zelkova acuminata</th>
<th>No.</th>
<th>Species</th>
<th>Larix</th>
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Tab. XVIII.  

Tab. XVIII. Showing the relative frequency of both deciduous and coniferous trees in Sect. II. in the accompanying plate.

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Pl. III. Sketch-map of the southern flank of Mt. Fuji.
Fig. 5. Pure stand of *Larix leptolepis* in No. 7 in Sect. III. (Photographed by the author).
Tab. XIX.

Sect. III.

Showing the relative frequency of both deciduous and coniferous trees in Sect. III. in the accompanying plate.

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</tbody>
</table>
Fig. 6. Deciduous tree-forest in No. 22, in Sect. III. *Acer pictum* Thunb., *Stewartia* monadelpha S. et Z. and other trees are represented in the figure. (Photographed by the author.)

It is very interesting to arrange the parts marked with asterisks according to height, and to compare the density of the forest at the different altitudes. (cf. P. 24.)

As Sect. II. of this Part is the most typical on this side, I shall take this section for comparison.

**Tab. XX.**

**Sect. II.** (*Forest-growth.*)

<table>
<thead>
<tr>
<th>Alt.</th>
<th>(No. 6) 437</th>
<th>(No. 7) 371</th>
<th>(No. 8) 406</th>
<th>(No. 16) 466</th>
<th>(No. 10) 830</th>
<th>mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2250m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>437</td>
</tr>
<tr>
<td>2000m.</td>
<td>(No. 7) 371</td>
<td>(No. 8) 406</td>
<td>(No. 16) 466</td>
<td>(No. 10) 830</td>
<td></td>
<td>516</td>
</tr>
<tr>
<td>1500m.</td>
<td>No. 42 440</td>
<td>No. 35 443</td>
<td>No. 38 222</td>
<td>(No. 37) 266</td>
<td></td>
<td>343</td>
</tr>
<tr>
<td>1240m.</td>
<td>No. 69 167</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>167</td>
</tr>
</tbody>
</table>

The figures show timber-supply in 1 square km. measured in fm.
In this table, we see that the forest-zone, which extends from 2500m. downwards, attains its maximum growth at the altitude of 2000m., then decreasing gradually, comes to an end at the boundary of the forest, at an altitude of about 1000m.

Now considering the Conifers only, the following table shows the density of the conifer-forest according to height.

Tab. XXI.

Sect. II. (Conifer-forest.)

<table>
<thead>
<tr>
<th>Alt.</th>
<th>(No. 6)</th>
<th>(No. 7)</th>
<th>(No. 8)</th>
<th>(No. 10)</th>
<th>(No. 16)</th>
<th>(No. 35)</th>
<th>(No. 38)</th>
<th>(No. 57)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2250m.</td>
<td>425</td>
<td>331</td>
<td>406</td>
<td>830</td>
<td>405</td>
<td>68</td>
<td>70</td>
<td>0</td>
<td>425m.</td>
</tr>
<tr>
<td>2000m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>495m.</td>
</tr>
<tr>
<td>1500m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>102m.</td>
</tr>
<tr>
<td>1250m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1000m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

In this table, we see that the Conifer-formation, which extends from 2500 m. downwards, attains its most luxuriant growth at an altitude of 2000m., then decreasing gradually, comes to an end at the 1250m. altitude.

The density of the deciduous forest according to height is shown in the following table.
Pl. IV. View of Mt. Fuji seen from Lake Motosu, showing the plant regions found partly in Part IV. and partly in Part I. Conifer, deciduous tree, and prairie, regions are clearly seen.

(After a sketch by the author).
In this table, we see that the deciduous forest which first comes in the shrubbery-formation at the high altitude of 2500m., increasing gradually, attains its maximum growth at the altitude of 1500m., then decreasing gradually, comes down to its boundary at the 1000m. altitude.

The following table shows the density of the forest-growth in general, and that of the coniferous and deciduous forest separately, according to the height.

b) Plant-formation in Part II.

Moving eastwards, let us discuss the formation of Part II. This is a rather limited area bordered by Mt. Ashitaka on the
south-west, and defined by the Kagosaka range on the north-east. From the Gotemba plain, we have a full view of this part. In the spring, when the snow still remains on the peak, the dark green belt of the pine-forest stands in clear relief against the back ground of the pure white snow. The belt is thick on the north, but becomes thinner and broader on the south, flanking downwards to the middle of the mountain, then giving way to the prairie which stretches far and wide to the fertile plain of Gotemba.

As is shown in the annexed map, the vegetation is the most scanty on this side. The treeless region, shown by the snow cap, stretches down as low as to about the 1200m. altitude, then giving way to Picea- or Abies-, but more especially to the red pine-, formation which is, however, not dense as in the case of other Parts, but very thin in every respect. This scarcity of vegetation is caused by the eruption of Höyé which took place but recently, the ground being as yet not ready to produce a dense forest there.

The north-eastern portion of this Part (Sect. IV. in the accompanying sketch-map) was surveyed in connection with Part I. The following table will show the relative frequency of Larix, Pinus densiflora, and deciduous trees.

Tab. XXIV.

Sect. IV.

<table>
<thead>
<tr>
<th>Species Nos.</th>
<th>Larix</th>
<th>Pinus densiflora</th>
<th>Deciduous broad leaved trees</th>
<th>Species Nos.</th>
<th>Larix</th>
<th>Pinus densiflora</th>
<th>Deciduous broad leaved trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100%</td>
<td></td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>100%</td>
<td></td>
<td></td>
<td>7</td>
<td>27%</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>3</td>
<td>100%</td>
<td></td>
<td></td>
<td>8</td>
<td>27%</td>
<td></td>
<td>73%</td>
</tr>
<tr>
<td>4</td>
<td>100%</td>
<td></td>
<td></td>
<td>9</td>
<td>100%</td>
<td></td>
<td>73%</td>
</tr>
<tr>
<td>5</td>
<td>55%</td>
<td>45%</td>
<td></td>
<td>10</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following table will show the density of the forest-growth in general according to height.

Tab. XXV.

Sect. IV. (Forest-Growth)

<table>
<thead>
<tr>
<th>Alt.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800m.</td>
<td>(No. 2) 132</td>
</tr>
<tr>
<td>1500m.</td>
<td>(No. 5) 131</td>
</tr>
<tr>
<td>1300m.</td>
<td>(No. 7) 49</td>
</tr>
<tr>
<td>1060m.</td>
<td>(No. 17) 68</td>
</tr>
<tr>
<td>940m.</td>
<td>(No. 24) 177</td>
</tr>
<tr>
<td>840m.</td>
<td>0</td>
</tr>
</tbody>
</table>

As we see in the annexed map, the forest-growth comes into existence at an altitude of 2200m. and gradually increasing
as it descends, attains its most luxuriant growth at the 940m. altitude, then decreasing gradually, comes to an end at an altitude of 840m.

The density of the *Larix*-growth is shown in the following table.

**Tab. XXVI.**

Sect. IV. (*Larix leptolepis*)

<table>
<thead>
<tr>
<th>Alt.</th>
<th>(No. 2)</th>
<th>(No. 5)</th>
<th>(No. 7)</th>
<th>(No. 17)</th>
<th>(No. 24)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800m.</td>
<td>132</td>
<td>83</td>
<td>15</td>
<td>7</td>
<td>0.3</td>
<td>132</td>
</tr>
<tr>
<td>1500m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>83</td>
</tr>
<tr>
<td>1300m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>1060m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>940m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.3</td>
</tr>
</tbody>
</table>

We see in this table that the *Larix*, which extends from an altitude of 2200m. downwards, attains its maximum growth at the height of 1800m., then gradually decreasing, comes almost to an end at an altitude of 940m.

The density of the growth of *Pinus densiflora* which stretches over this section is shown in the following table.

**Tab. XXVII.**

Sect. IV. (*Pinus densiflora*)

<table>
<thead>
<tr>
<th>Altitudes</th>
<th>(No. 21)</th>
<th>(No. 5)</th>
<th>(No. 7)</th>
<th>(No. 17)</th>
<th>(No. 24)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800m.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>55</td>
<td>160</td>
<td>0</td>
</tr>
<tr>
<td>1500m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1300m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1060m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>940m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>160</td>
</tr>
</tbody>
</table>
In this table, we see that *Pinus densiflora* which extends from 1300 m. downwards, attains its most luxuriant growth at an altitude of 970 m.

The density of the growth of the deciduous trees is as follows:

**Tab. XXVIII.**

Sect. IV. (*Deciduous trees*)

<table>
<thead>
<tr>
<th>Altitudes</th>
<th>Mean</th>
<th>(No.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800 m.</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1500 m.</td>
<td>46</td>
<td>5</td>
</tr>
<tr>
<td>1300 m.</td>
<td>37</td>
<td>7</td>
</tr>
<tr>
<td>1060 m.</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>940 m.</td>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>

The figures show timber-supply in 1 square hm. measured in 1 fm.

The maximum growth of the deciduous trees is seen at an altitude of 1500 m., but does not extend to any higher than an altitude of 1800 m.

The following table will show the density of the forest growth in general and that of the *Larix, Pinus* and deciduous trees, separately.
c) Plant-formation of Part III.

Now passing on to the north side, let us study Part III. The flank is generally like Part II., but has a far more developed forest-formation in the middle. The prairie is equally broad and extensive, not well suited to cultivation. This monotonous scenery of the prairie-formation is broken by lava-streams which show themselves here and there by the forests upon them.
Lakes are found on this side with water-plants such as Potamogeton and Najas. The general view of this grand flank is best obtained from the top of the Misaka pass. The colored plate annexed showing the northern vegetation was made from a sketch by myself. It is a glorious sight to see the truncated cone, late in the spring when the snow covers the peak above, and the prairie below, but leaves the green of the pine-forest doubly dark against the pure white ground of snow. The deciduous tree-formation is on this
side but faintly represented. The only vegetation distinguishable in the distance is the coniferous formation which surrounds the cone.

d.) Plant-formation of Part IV.

Turning our attention to the north-west side, let us consider the formation of Part IV. As is shown in the map annexed, the coniferous formation has here its most luxuriant growth. The Conifers stretch from the altitude of 2500 m. almost to the base. The deciduous forest is very poor and the prairie covers but a small area. A bird's eye view from the top of the Konno pass shows this part clad with ever-green conifers stretching like a level sea mile after mile of dark purple broken only by the mountain-range beyond. Broad leaved trees make patches here and there among the conifers, but are too scanty to produce any formation whatever. This coniferous region is called the "Aogi-
gahara"—the plateau of the ever-green trees. As we have previously explained, this beautiful formation is caused by the Aogigahara lava and the underground water supplied by the lakes.

Fig. 9. View of the north-western slope of the mountain, from Lake Shoji; the dark band at the base of the mountain is the Aogigahara Conifer-forest. (Photographed by the author).

Going further to the south-west through the Conifer-forest, we come down to the height of 1248 m. of Part I., where the formation of an immense deciduous forest opens before our eyes.

Thus, having completed our circuit of the mountain, let us consider the whole vegetation, combining the parts which we have discussed separately. Generally speaking, the formations are found to be more developed on the south side than on the north. Moreover, the deciduous forest predominates on the south, while on the north the Conifer-forest attains its most luxuriant growth. This difference of formation, as has been previously shown, is due to the physiography of the mountain on its different sides.

So much for the general aspect of the plant formation of
Mt. Fuji. The next chapter will be devoted to the consideration of the plant-regions zone by zone.

IV. ZONATION OF THE PLANT-REGIONS.

Climbing up through the vegetation of Mt. Fuji, we find that there are generally six regions according to altitude. They are 1) prairie*, 2) deciduous forest, 3) ever-green Conifers 4) Lari-x-region 5) Salix-Alnus-region and 6) alpine stretches. The deciduous forest is formed most abundantly on the south, but very scantily on the north and is likely to escape one's attention from a distance. The prairie-formation occupies a very spacious area on

the south-east, while on the north-west, it is covered by the lower stretches of the Conifer-forest. Excepting these two small differences, the other formations are so equally developed on every side that they make nearly complete zones around the cone. The

* The term prairie is here used in the sense of grass-region.
local differences of these zones are shown in the map annexed. In this chapter we shall try to examine these regions one by one.

**a) Prairie-Region (Basal region.)**

This region mostly covers the gentle slope of the basal portion of the mountain. It is found on almost all sides, except the north-west, where the immense broad Conifer-forest stretches down almost to the base of the mountain.

The upper limitation of this low region is made very irregular by the intrusion of the forest-formation downwards. On the north-west side this boundary comes down as low as to about the 1000 m. altitude but on the south-east side, it goes up as high as to 1500 m. On the due south, it comes down to the 1000 m. line. On the north-east side, i.e. in Part III, there is seen the greatest extent of the prairie-formation. The upper limitation of this region on this flank lies at 1500 m. Two streams of lava crowned by the forest come down to the altitude of 1000 m. This undulating prairie is altogether monotonous broken only by the valleys which run into one another in their zigzag courses. Here and there tree-patches are seen along the streams. This side is especially suitable for the red pines, and they form thin forests which are in one part naturally made, but in another, formed by afforestation. Here on this side, I must not forget to mention, is the *Picea*-formation which is found quite isolated near lake Yamanaka. (cf. Pl. V.).

As we have already stated, the forest-formation regularly coincides with the lava-stream, that is clearly seen in the case of this *Picea*-formation.

Glancing at the geological map of the mountain, we see that on the north-east flank, a lava stream has flowed from the top down through the basal slope and has extended to the western extremity of lake Yamanaka. This stream is clearly traced by the forest-patches here and there upon it; for this
Fig. 11. Distant view of the pure stand of *Picea polita* near Lake Yamanaka; the foreground shows a cultivation of *Morus alba* Linn. (Photographed by the author.)

*Picea*-formation is, after all, nothing but one of the forest-patches which flourish upon the porous lava of the stream.

Travelling along the base of the mountain on the north flank, one can not miss the noble forest of dark, green Conifers which extend over a distance of 2000 m., with a breadth of 1000 m. When I was journeying along this side, my attention was at once called to this great forest. On examining this secluded region, I found, to my astonishment, that it consists of a pure stand of *Picea polita*. This species is not rare on this mountain at rather high elevations, mixed with *Abies bicolor* and *Tsuga Sieboldi*. But to find its pure stand, so much broader than is seen elsewhere in the Empire, is something more than surprising.

The ground of this formation is all formed by large blocks of lava which are very porous in their structure, and very jagged in their surface. These characters of the lava have a very important relation to the forest-formation upon it. Moreover, underground water is plentifully supplied here by the adjacent lake. The Katsuragawa, an outlet of the lake, flows through this area of lava. Nothing is here wanting to make a luxuriant
growth. Towards the end of this beautiful formation, the forest becomes thinner and thinner until it gives way to the stretches of dwarf red pines. The accompanying photograph will give some idea of this pure stand.

We have one more forest-formation pushing down to this side of the prairie region. Looking at the northern area a little above, we see a stream of the Kenmarubi lava which is crowned, in the upper, with a Conifer forest, composed of *Picea* and *Abies*.
and in the lower part, with young red pine. This forest is not so dense as that on the side of lake Yamanaka owing to the lack of the underground water. (cf. Map.)

On the south-west side, the Aogigahara lava comes down almost to the base of the mountain, and being nourished by the underground water, is covered by the dense coniferous forest of *Picea, Tsuga* and *Abies*.

![Fig. 13. The Aogigahara forest at Shoji lake; the forest of the lake-side is seen in the background. (Photographed by the author).](image)

Generally speaking, all parts of the prairie-region have nearly the same plants. But when we consider the patches of forest which are found isolated in the prairie, some differences may be observed. On the southern flank, some deciduous broad trees come down into the prairie making patches here and there mostly along the valley and give some variety to the monotonous scenery on this side; but on the northern flank, red pines play the part that the broad leaved trees take on the south. On the south, there is no group of pines on the prairie, nor is it likely that any
existed there in former times; for there is no evidence of one even in the relics buried in the soil. The red pine, therefore, does not seem to be suited to the south side, while the broad leaved trees grow better on this side. This fact plainly shows us that the southern prairie-side has sufficient temperature and humidity to maintain the broad leaved trees in the growing season, while the northern prairie-side has not. This is easily explainable by the climatic conditions of the different sides which we have already alluded to.

Fig. 14. *Cryptomeria*-avenue of the Asama-shrine (Yoshida).
The floral aspect of the prairie-region is almost the same on all sides. On the Jurigi side, there are some areas clad with *Arundinaria*, *Miscanthus* or sometimes with shrubbery. The plants found in the prairie-formation are as follows:

**Polypodiaceae.**

<table>
<thead>
<tr>
<th>Latin names</th>
<th>Japanese names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adiantum monochlamys <em>EAT.</em></td>
<td><em>Hakoneso.</em></td>
</tr>
<tr>
<td>Adiantum pedatum <em>LINN.</em></td>
<td><em>Kujakushida.</em></td>
</tr>
<tr>
<td>Aspidium japonicum <em>MAKINO.</em></td>
<td><em>Hariganewarabi.</em></td>
</tr>
<tr>
<td>Aspidium oligophlebium <em>CHRIST.</em></td>
<td><em>Himewarabi.</em></td>
</tr>
<tr>
<td>Asplenium incisum <em>THUNB.</em></td>
<td><em>Toranooshida.</em></td>
</tr>
<tr>
<td>Asplenium varians <em>HOOK et GREV.</em></td>
<td><em>Iwatoranoo or Himetoranoo.</em></td>
</tr>
<tr>
<td>Athyrium nipponicum <em>HOOK.</em></td>
<td><em>Inuwarabi.</em></td>
</tr>
<tr>
<td>Athyrium thelypteroides <em>DESV.</em></td>
<td><em>Hakumoinode or Miyamashikeshida.</em></td>
</tr>
<tr>
<td>Athyrium yokoscense <em>MAKINO.</em></td>
<td><em>Hebinonegaza or Koinuwarabi.</em></td>
</tr>
<tr>
<td>Blechnum Spicant *Roth. var. sub-serrata <em>LOWE.</em></td>
<td></td>
</tr>
<tr>
<td>Coniogramme japonica <em>DIELS.</em></td>
<td></td>
</tr>
<tr>
<td>Cryptogramme japonica <em>THUNB.</em></td>
<td></td>
</tr>
<tr>
<td>Cystopteris japonica <em>LUERSS.</em></td>
<td></td>
</tr>
<tr>
<td>Diplazium japonicum <em>BEDD.</em></td>
<td></td>
</tr>
<tr>
<td>Diplazium lanceum <em>PRESL.</em></td>
<td></td>
</tr>
<tr>
<td>Diplazium Wichurae <em>METT.</em></td>
<td></td>
</tr>
<tr>
<td>Drymoglossum carnosum <em>HOOK.</em></td>
<td></td>
</tr>
<tr>
<td>Microlepia hirsuta <em>PRESL.</em></td>
<td></td>
</tr>
<tr>
<td>Microlepia marginalis <em>HANCE.</em></td>
<td></td>
</tr>
<tr>
<td>Microlepia Wilfordii <em>MOORE.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium decursivo-pinnatum <em>BK.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium dilatatum <em>DESV.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium *Felix-mas <em>RICH.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium *Felix-mas *RICH. var. lacerum <em>CHRIST.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium Maximowiczii <em>BAKER.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium Phegopteris <em>BAUMG.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium prolixum <em>DIELS.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium sophoroides <em>DESV.</em></td>
<td></td>
</tr>
<tr>
<td>Nephrodium Thelypteris <em>DESV.</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Japanese names</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Hakoneso.</em></td>
<td></td>
</tr>
<tr>
<td><em>Kujakushida.</em></td>
<td></td>
</tr>
<tr>
<td><em>Hariganewarabi.</em></td>
<td></td>
</tr>
<tr>
<td><em>Himewarabi.</em></td>
<td></td>
</tr>
<tr>
<td><em>Toranooshida.</em></td>
<td></td>
</tr>
<tr>
<td><em>Iwatoranoo or Himetoranoo.</em></td>
<td></td>
</tr>
<tr>
<td><em>Inuwarabi.</em></td>
<td></td>
</tr>
<tr>
<td><em>Hakumoinode or Miyamashikeshida.</em></td>
<td></td>
</tr>
<tr>
<td><em>Hebinonegaza or Koinuwarabi.</em></td>
<td></td>
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<tr>
<td><em>Shishigashira.</em></td>
<td></td>
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<tr>
<td><em>Iwaganeso.</em></td>
<td></td>
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<tr>
<td><em>Tsishinobu.</em></td>
<td></td>
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<tr>
<td><em>Usukimewarabi.</em></td>
<td></td>
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<tr>
<td><em>Shikeshida.</em></td>
<td></td>
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<tr>
<td><em>Herashida.</em></td>
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<tr>
<td><em>Nokogirishida or Yabukujaku.</em></td>
<td></td>
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<tr>
<td><em>Mamezuta.</em></td>
<td></td>
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<tr>
<td><em>Inushida.</em></td>
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<tr>
<td><em>Fumotoshida.</em></td>
<td></td>
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<tr>
<td><em>Orenshida.</em></td>
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<tr>
<td><em>Gejigejishida.</em></td>
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<tr>
<td><em>Shiranewarabi.</em></td>
<td></td>
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<tr>
<td><em>Menma, Oshida or Miyamainode.</em></td>
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<tr>
<td><em>Kumawarabi.</em></td>
<td></td>
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<tr>
<td><em>Nantaishida.</em></td>
<td></td>
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<tr>
<td><em>Miyamawarabi.</em></td>
<td></td>
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<tr>
<td><em>Ibukishida.</em></td>
<td></td>
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<tr>
<td><em>Hoshida.</em></td>
<td></td>
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<tr>
<td><em>Himeshida or Shorima.</em></td>
<td></td>
</tr>
</tbody>
</table>
Fig. 15. Prairie-region on the north side of the mountain. (after a photograph).

Niphobolus linearifolius Hook.
Odontosoria chinensis Kühn. var. tenuifolia Makino.
Onoclea sensibilis Linn.
Polypodium hastatum Thunb.
Polypodium lineare Thunb.
Polypodium vulgare Linn. var. japonicum Fr. et Sav.
Polystichum amabile (Sm.)
Polystichum aristatum Presl.
Polystichum craspedosorum Diels.
Polystichum falcatum Diels var. Fortunei Baker.
Polystichum tripterum Sm.

Polystichum varium Presl.
Pteridium aquilinum Kühn.
Pteris cretica Linn.
Pteris serrulata Linn.
Struthiopteris germanica Willd.
Woodsia manchuriensis Hook.

Birōdoshida.
Horashinobu.
Kōyawarabi.
Mitsudeuraboshi.
Nokishinobu.

Oshagajidenda.
Ōbakanawarabi.
Kanawarabi or Hosobakanawarabi.
Tsurudenda.

Yabusotetsu.
Jumonjishida, Shūmokushida or Mitsu-dekaguma.
Ritachishida.
Warabi.
Ōbanoinomotosō.
Inomotosō.
Kusasotetsu.
Fukuroshida.
Woodsia polystichoides Eaton. Iwadenda.
Woodwardia radicans Sw. Komochishida.

**Schizaceae.**

Lygodium japonicum Sw. Kanikusa.

**Osmundaceae.**

Osmunda regalis LINN. var. japonica Zenmai.
Milde.

**Ophioglossaceae.**

Botrychium ternatum Sw. Fuyunohanawarabi.

**Equisetaceae.**

Equisetum arvense L. Sugina.

**Lycopodiaceae.**

Lycopodium clavatum LINN. Hikagenokazura.
Lycopodium serratum THUNB. Togeshiba.

**Selaginellaceae.**

Selaginella Kraussiana A. Br. Kuramazoke.
Selaginella involvens SPRING. Iwahiba.

**Coniferæ.**

Abies firma S. et Z. Momi.
Cephalotaxus drupacea S. et Z. Inugaya.
Juniperus rigida S. et Z. Muro or Nezu.
Pinus densiflora S. et Z. Akamatsu.
Taxus baccata LINN. subsp. cuspidata PILG. IchiII or Araragi.
Torreya nucifera S. et Z. Kaya.

**Sparganiaceae.**

Sparganium longifolium TURCZ. Mikuri.
Potamogetonaceae.
Potamogeton crispus Linn. Ebīmo.
Potamogeton polygonifolius Pour. Hirumushiro.
Potamogeton Gaudichaudi Cham. Sasabamo.

Alismataceae.
Sagittaria sagittifolia Linn. Omodaka.

Hydrocharitaceae.
Blixa caulescens Max. Yanagisubuta.
Hydrocharis Morsus-ranae Linn. Dochikagami.
Ottelia alismoides Pers. Mizuōbako.

Gramineae.
Agopyrum semicostatum Nees. Kamojigusa.
Agrostis perennans Tuckerm. Yamamukabō.
Alopecurus fulvus Sm. Suzumenoteppō.
Andropogon brevifolius Sw. Ushikusa.
Andropogon micranthus KUNTH. var. genuinus HACkEL.
Andropogon Nardus Linn. var. Geeringii HACkEL.
Arthraxon ciliare BEAUB.
Arundinella anomala STEUD.
Beckmannia erucæformis HOST.
Brachypodium silvaticum BEAuV.
Bromus japonicus THUNB.
Bromus pauciflorus HACk.
Brylkinia caudata Fr. SCHM.
Calamagrostis arundinacea ROTH. var. sciuroides HACk.
Calamagrostis Epigeios ROTH.
Diarrhena japonica Fr. et Sav. Saitōgaya.
Eleusine indica GÆRTN.
Eragrostis ferruginea BEAuV.
Eragrostis pilosa BEAuV.
Eriochloa villosa KUNTH.
Festuca ovina Linn. Yamaawa.

Glyceria remot 

Glyceria tonglensis CLARK.
Imperata arundinacea CYR. var.
Koenigii HACK.
Isachne australis R. BR.
Leersia oryzoides SW. var. japonica
HACK.
Lophatherum gracile BRONGN. var.
elatum HACK.
Milium effusum LINN.
Miscanthus Matsumure HACK.
Miscanthus sinensis ANDR.
Muehlenbergia japonica STEUD.
Muehlenbergia japonica STEUD. var.
hakonensis HACK.
Oplismenus Burmanni BEAUB.
Panicum acafanthum STEUD.
Panicum Crus-Galli LINN.
Panicum indicum LINN.
Panicum sanguinale LINN.

Miyamaichigotsunagi.
Obanodofotsunagi.
Fushigechigaya.
Chigozasa.
Sayanukagusa.
Sasakusa.
Ibukinukabo.
Kariyasamodoki.
Sasuki.
Nezumigaya.
Tachinezumigaya.
Chizinimasa.
Nukakibi.
Nobie.
Hainumeri.
Mehijiwa.

Fig. 16. View of Mt. Fuji seen from Yoshida; forest-regions are clearly visible.
(after a photograph).
Pl. V. View of Mt. Fuji, seen from the Fujigawa (Fuji-river); forest regions are faintly visible. (After a photograph)
Panicum sanguinare LINN. var. ciliare DÖLL.
Paspalum Thunbergii KUNTH.
Pennisetum japonicum TRIN.
Phalaris arundinacea LINN.
Phragmites communis TRIN.
Poa annua LINN.
Poa palustris LINN. var. strictula HACK.
Pollinia imberbis NEES. genuina HACK.
Pollinia nuda (TRIN.) HACK.
Polypogon Higegaweri STEUD.
Rottboellia compressa LIN. f. var. japonica HACK.
Sasa albo-marginata MAK. et SHIB.
Sasa borealis MAK. et SHIB.
Setaria glauca BEAUB.
Setaria pachystachys F. et S.
Setaria viridis BEAUV.
Spodiopogon cotulifer HACK.
Spodiopogon sibiricus TRIN.
Sporobolus elongatus R. BR.
Themeda Forskali HACK. var. japonica HACK.
Trisetum flavescens BEAUB. var. papillosum HACK.
Zoysia pungens WILLD.

**Cyperaceæ.**

Bulbostylis barbata KUNTH.
Carex arenicana F. SCHMIDT.
Carex Brownii TUCK. var. transversa KUEK.
Carex brunnea THUNB.
Carex caryophylla LAUER subsp. nervata KUEK.
Carex curvicaulis Fr. et SAV.
Carex Gaudichaudiana KUNTH var. Thunbergii KUEK.

Kemehijiwa.
Suzumenohie.
Chi karashiba.
Kusayoshi.
Yoshi, Ashi or Jishibari.
Suzumenokatabira.

Kawaraichigotsunagi.
Ashiboso.
Sasagaya.
Hiegairi.

Uschinoshippei.
Kumazasa.
Suzutake.
Huma-enokoro.
Enokorogusa.
Aburasusuki.
Obarasusuki.
Nezumino-o.

Megarukaya.
Kanitsurigusa
Shiba
Carex gibba Wahl.
Carex incisa Boot.
Carex ischnostachya Steud.
Carex japonica Thunb.
Carex japonica Thunb. var. aphanolepis Kuek.
Carex japonica Thunb. var. chlorostachys Kuek.
Carex Morrowii Boot.
Carex Oneei Fr. et Sav.
Carex pseudo-conica Fr. et Sav.
Carex satsumensis Fr. et Sav.
Carex stenantha Fr. et Sav.
Cyperus difformis Linn.
Cyperus Haspan Linn.
Cyperus Iría Linn.
Cyperus pilosus Vahl.
Cyperus rotundus Linn.
Eleocharis acicularis R. Br.
Eleocharis japonica Miq.
Finibrystylis autumnalis Rem. et Sch.
Finibrystylis diphylla Vahl.
Finibrystylis miliacea Vahl.
Finibrystylis squarrosa Vahl.
Kyllingia brevifolia Rottb.
Lipocarpha microcephala Kth.
Mariscus Sieberianus Nees.
Pycreus globosus Reichb. var. stricta Hook.
Scirpus erectus Poir.
Scirpus Cyperinus Kunth var. concolor Mak.

Araceæ.

Acorus gramineus Ait.
Arisæma serratum Schott. form. Blumei Mak.
Pinellia tripartita Schott.

Masukusa.
Tanisuge.
Jūsusuge.
Higokusa.
Sawasuge.
Shirasuge.
Kansuge.
Harisuge.
Ōtosuge.
Aburashiba.
Iwasuge.
Tamagayatsuri.
Mizuhanabi.
Kogomeyatsuri.
Ushigayatsuri or Onigayatsuri.
Hamasuge.
Matsubai.
Harii.
Himelentsuki.
Tentsuki.
Hitoko.
Azetentsuki.
Himekugu.
Hinjigayatsuri.
Kugi.
Azegayatsuri.
Hotarui.
Aburagaya.

Sekishō.
Tennanshō.
Ohange.
Eriocaulaceae.
Eriocaulon sexangulare LINN. Mizutamasō.

Commelinaceae.
Aneilema keisak HASSK. Ibokusa.
Commelina communis LINN. Tsuyukusa.

Pontederiaceae.
Monochoria Korsakowii REGEL. et MAACK. Mizuoi.
Monochoria vaginalis PRESL. var. plantaginea SOLMS.-LAUB. Mizunagi.

Juncaceae.
Juncus effusus LINN. var. decipiens BUCH. Yū.
Luzula campestris DC. var. capitata MIQ. Suzumenohie.
Luzula plumosa E. MEY. Nakaboshisō.

Liliaceae.
Allium japonicum REGEL. Yamarakkiō.
Clintonia udensis TRAUTV. Tsubameomoto.
Disporum sessile DON. Hochakusō.
Disporum smilacinum A. GR. Chigoyuri.
Hemerocallis fulva LINN. Yabukwanzō.
Hosta cœrulea TRATT. form. lancifolia MATSUM. Mizugibōshi.
Lilium auratum LINDL. Yamayuri.
Lilium concolor SALISB var. parthenion ELW. Akahimeyuri.
Lilium cordifolium THUNB. Ubayuri.
Lilium Maximowiczii REGEL. Ko-oniyuri.
Liriope graminifolia BAK. var. communis MAX. Yaburan.
Metanarthecium luteo-viride MAXIM. Nogiran
Polygonatum latifolium DESF. var. commutatum BAKER. Narukoyuri.
Polygonatum officinale All.
Scilla japonica Baker
Smilax china Linn.
Smilax herbacea Linn.
Smilax Sieboldi Miq.
Tricyrtis hirta Hook.
Tricyrtis macropoda Miq.
Veratrum Maackii Regel.
Veratrum nigrum Linn.

Amadokoro.
Tsurubo.
Sarutoriibara.
Shiole.
Yamakashiū.
Hototogisu.
Yamanatotogisu.
Aoyagisō.
Shuroso.

Amaryllidaceae.
Lycoris sanguinea Maxim.

Kitsumenokamisori.

Dioscoreaceae.
Dioscorea gracillima Miq.
Dioscorea japonica Thunb.
Dioscorea septemloba Thunb.

Tachidokoro.
Yumanoimo.
Momijidokoro.

Iridaceae.
Iris japonica Thunb.
Iris sibirica Linn. var. orientalis

Thunb.

Shaga.
Ayame.

Orchidaceae.
Calanthe discolor Lindl.
Epipactis erecta Wettst.
Epipactis falcata Wettst.
Epipactis Thunbergii A. Gray.
Goodyera pendula Maxim.
Liparis auriculata Blume.
Neottia micrantha Lindl.
Platantheraussuriensis Maxim.
Spiranthes australis Lindl.
Oberonia japonica Mak.

Ebine.
Giuron.
Kiraran.
Suzuran.
Tsurishūsuran.
Kumokirisō.
Himenuyōran.
Tōbosō.
Nējibana.
Yorakuran.

Saururaceae.
Houttuynia cordata Thunb.

Dokudami.
Chloranthaceæ.

Chloranthus serratus R. et S.  
Chloranthus japonicus SIEB.  

Futarishizuka.  
Hitorishizuka.

Salicaceæ.

Populus tremula LINN. var. villosa  
WESM.  
Salix Caprea LINN.  
Salix japonica THUNB.

Yamanarashi.  
Bakkoyanagi.  
Shibayanagi.

Betulaceæ.

Alnus Yasha MATSUM.  
Carpinus japonica BLUME.  
Carpinus yedoensis MAXIM.  
Corylus heterophylla Fish.

Yashabushi.  
Kunashide.  
Inashide.  
Hashibami.

Fagaceæ.

Castanea vulgaris LAM. var. japonica DC.  
Quercus acuta THUNB.  
Quercus cuspidata THUNB.

Kuri.  
Akagashi.  
Shinoki.

Fig. 17. View of Mt. Fuji seen from Suzukawa, forest regions are faintly visible, (after a photograph.)
Quercus dentata THUNB.  
Quercus glandulifera BLUME.  
Quercus glauca THUNB.  
Quercus grosseserrata BLUME.  
Querus serrata THUNB.

**Ulmaceae.**

Celtis sinensis Pers.  

**Moraceae.**

Fatoua pilosa GAUD. var. subcordata  
RUPR.  
Humulus japonicus S. et Z.

**Urticaceae.**

Boehmeria holosericea BLUME.  
Boehmeria japonica MIQ.  
Boehmeria japonica MIQ. var. tricuspis HANCE.  
Boehmeria nivea BLUME.  
Boehmeria Sieboldiana BLUME.  
Boehmeria spicata THUNB.  
Elatostema umbellatum BLUME var. majus MAXIM.  
Laportea bulbifera WEDD.  
Memorialis hirta WEDD.  
Nanocnide japonica BLUME.  
Pellonia radicans WEDD.  
Pilea petiolaris BLUME.  
Urtica Thumbergiana S. et Z.

**Loranthaceae.**

Viscum album LINN.

**Santalaceae.**

Thesium chinense TURCZ.

Kashiwa.  
Konara.  
Arakashi.  
Mizunara.  
Kunnyo.

Yenoki.

Kuwakusa.  
Kanamugura.

Oniyabumao.  
Yabumao.

Akaso.  
Mao.

Nagabayabumao.  
Koakaso.

Uwabamisō.  
Mukagoirakusa.

Tsunrumao.  
Katensō.

Sanshōsō.  
Miyamamuzu.

Irakusa.

Yadoriki.

Kanabikiso.
Aristolochiaceae.
Aristolochia debilis S. et Z.  Umanosuzukusa.
Aristolochia Kámpferi WILLD.  Oba-umanosuzukusa.

Polygonaceae.
Polygonum alatum HAM.  Tunisoba.
Polygonum cuspidatum S. et Z.  Itadori.
Polygonum esculentum  Soba.
Polygonum flaccidum RÖXB.  Yanagitade.
Polygonum muricatum LINN.  Nagaba-unagizukami.
Polygonum Posumbu HAM.  Hanatade.
Polygonum Posumbu HAM. var. Blumei (MEISN.)  Inutade.
Polygonum senticosum MEISN.  Mamakonoshirinugui.
Polygonum Sieboldi MEISN.  Unagizuru.
Polygonum Thunbergii S. et Z.  Mizosoba.
Polygonum Thunbergii S. et Z. var. Maackianum MAXIM.  Sudekusa.
Polygonum viscosum HAM. var. vernicosum MEISN.  Nebaritade.
Rumex Acetosa LINN.  Suiba.
Rumex japonicus MEISN.  Gishigishi.

Chenopodiaceae.
Chenopodium album LINN.  Akaza.

Amarantaceae.
Achyranthes bidentata BL. var. japonica MIQ.  Inokozuchi.
Amaranthus Blitum LINN.  Inubiyu.

Portulacaceae.
Portulaca oleracea LINN.  Suberikiyu.

Caryophyllaceae.
Arenaria serpyllifolia LINN. var. leptoclados Guss.  Nominotsuzuri.
Cerastium vulgatum **Linnaeus** var. glandulosum **Koch**.

Cucubalus baccifer **Linnaeus** var. japonicus **Miq**.

Dianthus superbus **Linnaeus**.

Lychnis Miqueliana **Rohr**.

Melandryum firmum **Rohr**.

Stellaria aquatica **Scop**.

Stellaria florida **Fisch**. var. angustifolia **Maxim**.

Stellaria media **Linnaeus**.

Stellaria uliginosa **Linnaeus**.

**Mimina**gusa.

**Nanban**hakobe.

**Kawara**nadeshiko.

**Fushigi**urosno.

**Fushiguro**.

**Ushihakobe**.

**Iwatsumekusa**.

**Hakobe**.

**Nomina**fusuma.

**Nymphaeaceae**.

*Nuphar japonicum* **DC**.

**Kawahone**.

**Ceratophyllaceae**.

*Ceratophyllum demersum* **Linnaeus**.

**Kingiyomo**.

**Magnoliaceae**.

*Illicium anisatum* **Linnaeus**.

*Magnolia Kobus* **DC**.

*Magnolia hypoleuca* S. et Z.

*Kadsura japonica* **Linnaeus**.

*Schizandra nigra* **Maxim**.

**Shikimi**

**Kobushi**.

**Ho-noki**.

**Sanekazura**.

**Matsubusa**.

**Ranunculaceae**.

*Aconitum Fischeri* **Reich**.

*Aconitum lycoctonum* **Linnaeus**.

*Anemone cernua* **Thunb**.

*Anemone japonica* S. et Z.

*Aquilegia glandulosa* **Fisch**.

*Cimicifuga foetida* **Linnaeus** var. simplex **Huth**.

*Clematis alpina* **Mill**.

*Clematis apiifolia* **DC**.

*Clematis heracleifolia* DC. var. stans (S. et Z.)

**Torikabuto**.

**Reiginso**.

**Okinagusa**.

**Shimeigiku**.

**Yamaodamaki**.

**Sarashinashōma**.

**Miyamahianshōzuru**.

**Botanzuru**.

**Kusabotan**.
Clematis recta LINN. var. paniculata (THUNB.)
Isopyrum stoloniferum MAXIM.
Paeonia obovata MAXIM.
Ranunculus acer LINN.
Ranunculus aquatilis LINN. var. flaccidus (PERS.) form. Drouetii
HIRM.
Ranunculus japonicus LUNGS.
Ranunculus sceleratus LINN.
Thalictrum minus LINN. var. elatum
LECOY.
Thalictrum simplex LINN. var. affine
RGL.

Senninsö.
Shirokanesō.
Yamashakuyaku.
Kinpōge.

Isopyrum stoloniferum MAXIM.
Shirokaneso.

Paeonia obovata MAXIM.

Ranunculus acer LINN.

Ranunculus sceleratus LINN.

Thalictrum minus LINN. var. elatum
LECOY.

Baikwamo.
Kitsunenobotan.
Tagarashi.

Thalictrum simplex LINN. var. affine
RGL.

Aikaramatsu.

Nokaramatsu.

Lardizabalaceae.

Akebia lobata DCNE.
Akebia quinata DCNE.

Mutsuba-akebi.
Akebi.

Berberidaceae.

Berberis Thunbergii DC.
Epimedium macranthum MORR. et DECNE.

Kotoritomarazu.
Ikarisō.

Minispermaceae.

Cocculus Thunbergii DC.

Aotsuzurafuji.

Lauraceae.

Ciunamomum pedunculatum NEES.
Lindera glauca BLUME.
Lindera obtusiloba BLUME.
Lindera præcox BLUME.
Lindera umbellata THUNB.
Litsea glauca SIEB.
Machilus Thunbergii S. et Z.

Yabunikkei.
Yamalōbashi.
Danlōbai.
Aburachan.
Kuromogi.
Shirodama.
Luogum.

Papaveraceae.

Chelidonium Majus LINN.
Corydalis decumbens PERS.

Kusanowō.
Yabu-engosaku.
Corydalis incisa Pers.
Corydalis pallida Pers.
Macleaya cordata R. Br.

Murasakikeman.
Miyamokikeman.
Chanpagiku.

Cruciferæ.

Arabis sagittata DC.
Capsella bursa-pastoris MÉNCH.
Cardamine hirsuta LINN. var. sylvatica LINN.
Dontstemon dentatus BGE.
Draba nemorosa LINN. var. hebecarpa LEDEB.
Nasturtium montanum WALL.
Nasturtium palustre DC.

Yamahatazao.
Nazuna.
Tanetsukebana.
Hanahatazao.
Inunazuna.
Sukashitakabō.
Inugarashi.

Crassulaceæ.

Sedum Alfredi HCE.
Sedum Kamtschaticum FISCH.
Sedum lineare THUNB.
Sedum Telephium LINN. var. purpureum.
Sedum verticillatum LINN.

Komochimannengusa.
Kirinsō.
Onomannengusa.
Benkeisō.
Mitsubabenkeisō.

Saxifragaceæ.

Astilbe chinensis Fr. et Sav. var.
   japonica MAXIM.
Astilbe Thunbergii MIQ.
Deutzia gracilis S. et Z.
Deutzia scabra THUNB.
Hydrangea hirta S. et Z.
Hydrangea involucrata SIEB.
Hydrangea paniculata SIEB.
Hydrangea scandens MAXIM.
Parnassia palustris LINN.
Ribes fasciculatum S. et Z.
Saxifraga cortusæfolia S. et Z.
Saxifraga sarmentosa LINN.

Awamorishōma or Chidakesashi.
Tori-ashishōma.
Hime-utsugi.
Utsugi.
Koajisai.
Tama-ajisai.
Norinoki.
Gōtōzuru.
Mumebachisō.
Yabusanzashi.
Daimonjisō.
Yukinoshita.
Hamamelidaceae.

Hamamelis japonica Sieb. et Zucc. Mansaku.

Rosaceae.

Agrimonia pilosa Ledeb.
Aruncus silvester Kostel.
Cydonia japonica Pers. var. pygmea Maxim.
Fragaria indica Andr.
Geum japonicum Thunb.
Potentilla chinensis Ser.
Potentilla cryptotenike Maxim.
Potentilla Kleiniana W. et A.
Pourthiea villosa DCNE.
Pyrus Toringo Sieb.
Rosa multiflora Thunb.
Rosa Wichurianaana Crep.
Rubus palmatus Thunb.
Rubus parvifolius Linn.
Rubus phoenicosiarius Maxim.
Rubus rosefolius Sm.
Rubus Thunbergii S. et Z.
Rubus trifidus Thunb.
Sanguisorba officinalis Linne.
Spiraea Blumei G. Don.
Spiraea bullata Maxim.
Spiraea Thunbergii Sieb.
Stephanandra flexnosa S. et Z.
Stephanandra Tanaka Fr. et Sav.
Ulmia multijuga (Maxim.)
Ulmia purpurea (Maxim.)

Leguminosae.

Æschynomene indica Linne.
Albizia Julibrissin Boiv.
Amphicarpæa Edgeworthii Benth.
var. japonica Oliv.
Cæsalpinia sepiaria Roxb.

Kusaboke.
Hebiichigo.
Daikonsō.
Kawarasailko.
Mitsunoto.
Ohebi-ichigo.
Kamatsuka.
Zumi.
Noibara.
Terihanobara.
Ki-ichigo.
Nawashiro-ichigo.
Urajiro-ichigo.
Buraichigo.
Kusa-ichigo.
Kajiichigo.
Waremolō.
Iwagasa.
Koshimotsuke.
Kogomebana.
Kogome-utsugi.
Kana-utsugi.
Shinotsukeszō.
Kōganoko.
Cladrastis amurensis B. et H. var. floribunda MAXIM.
Crotalaria sessiliflora LNN.
Cassia mimosoides LNN.
Desmodium Gardneri BENTH.
Desmodium laburnifolium DC.
Desmodium Oldhami Oliv.
Desmodium podocarpum DC. var. japonicum MAXIM.
Desmodium polycarpum DC.
Indigofera pseudotinctoria MATSUM.
Krauhinia floribunda TAUB.
Krauhinia japonica TAUB.
Lathyrus Davidii HANCE.
Lespedeza bicolor TURCZ.
Lespedeza Buergeri MIQ.
Lespedeza cyrtobotrya MIQ.
Lespedeza juncea PERS. var. sericea HEMSL.
Lespedeza pilosa S. et Z.
Lespedeza stricta H. et A.
Lespedeza villosa PERS.
Lespedeza virgata DC.
Lotus corniculatus LNN. var. japonicus RGL.
Pueraria Thumbergiana BENTH.
Rhynchosia volubilis LOUR.
Sophora platycarpa MAXIM.
Vicia Cracea LNN. var. japonica MIQ.
Vicia pseudo-orobus FISCH. et MEY.
Vicia sativa LNN.
Vicia unijuga BR.

Geraniaceæ.

Geranium nepalense SWEET.
Geranium Sieboldi MAXIM.
Geranium Wilfordi MAXIM.

Oxalidaceæ.

Oxalis corniculata LNN.

— 60 —
Linaceae.

Linum posarioides PL. 
Matsubaninnin.

Rutaceae.

Boeninghausenia albiflora REICHB. Arashigusa.
Orixa japonica THUNB. Kokusagi.
Zanthoxylum pepiritum DC. Sanshu.
Zanthoxylum schinnifolium S. et Z. Inuzanshu.

Simarubaceae.

Pircasma quassioides BENN. Nigaki.

Polygalaceae.

Polygala japonica HOUTT. Himehagi.

Euphorbiaceae.

Acalypha australis LINN. Inokigusa.
Euphorbia adenochlora MORR. et DCNE. No-urushi.
Euphorbia humifusa WILLD. Nishigigusa.
Euphorbia helioscopia LINN. Todaigusa.
Euphorbia pekinensis RUPR. Takatodai.
Euphorbia Sieboldiana MORR. et DCNE. Natsutodai.
Phyllanthus Matsumurae HAYATA. Himenikansō.
Phyllanthus Urinaria LINN. Komikansō.
Securinega flaggeoides MUELL ARG. Hitotsubahagi.

Callitrichaceae.

Callitriche japonica ENGEL. Awagoke.

Coriariaceae.

Coriaria japonica A. GR. Dokuutsugi.

Buxaceae.

Buxus sempervirens var. japonica MAKINO. Asamatsuge.
Anacardiaceæ.
Rhus semi-alata Murr. var. Osbeckii
   DC.  Fushinoki.
Rhus silvestris S. et Z.  Yamahaze.
Rhus Toxicodendron Linn. var.
   radicans Miq.  Tsutaurushi.
Rhus trichocarpa Miq.  Yamauruski.

Aquifoliaceæ.
Ilex crenata Thunb.  Iwatsuge.
Ilex integra Thunb.  Mochinoki.
Ilex rugosa Fr. Schm.  Tsurutsuge.
Ilex Sieboldi Miq.  Umemodoki.

Celastraceæ.
Celastrus articulatus Thunb.  Tsuru-umemodoki.
Euonymus japonica Thunb.  Masaki.
Euonymus oxyphylla Miq.  Tsuribana.
Tripterigyum Wilfordi Hook.  Kurozuru.

Staphyleaceæ.
Euscaphis staphyleoides S. et Z.  Gonzui.

Balsaminaceæ.
Impatiens nolitangere Linn.  Kitsurifunesō.
Impatiens Textori Miq.  Tsurifunesō.

Sabiaceæ.
Meliosma myriantha S. et Z.  Awabuki.
Meliosma tenuis Maxim.  Miyamahōso.

Rhamnaceæ.
Berchemia racemosa S. et Z.  Kumayanagi.
Rhamnus japonica Maxim. var. genuina Maxim.  Kuroumemodoki.
Vitaceæ.

Vitis flexuosa THUNB.  
Vitis heterophylla THUNB.  
Vitis inconstans MIQ.  
Vitis Thunbergii S. et Z.  
Vitis coignetiae PULL.

Theaceæ.

Thea japonica NOIS.  
Eurya japonica THUNB.

Stachyuraceæ.

Stachyurus præcox S. et Z.

Guttiferæ.

Hypericum Ascyron LINN.  
Hypericum chinense LINN.  
Hypericum erectum THUNB.  
Hypericum erectum THUNB. var. cæspitosum MAKINO.  
Hypericum japonicum THUNB.  
Hypericum patulum THUNB.

Elatinaceæ.

Elatine orientalis MAKINO.

Violaceæ.

Viola japonica LANGSD.  
Viola Patrinii DC. var. chinesis GING.  
Viola silvestris Kit. var. grypoceras A. GR.  

Thymelæaceæ.

Daphne pseudo-mezereum A. GR.  
Wikstroemia Ganpi MAXIM.
Elaeagnaceae.

Elaeagnus glabra Thunb.  Tsurugumi.
Elaeagnus macrophylla Thunb.  Marubagumi.
Elaeagnus umbellata Thunb.  Akiyumi.

Lythraceae.

Lythrum Salicaria Linn.  Misohagi.
Rotala indica Kæhne var. uliginosa Miq.  Kikashigusa.

Onagraceae.

Circœa quadrisulcata Maxim.  Mizutamaso.
Epilobium angustifolium Linn.  Yanagisô.
Ludwigia prostrata Roxb.  Tagobô.

Halorrhagidaceæ.

Haloragis micrantha R. Br.  Arinotogusa.

Fig. 18. *Vitis Coignetia* Pull. and *Angelica polyclada* Franch., Yoshida side, about 1200 m. above the sea. (From the Atlas of Japanese Vegetation, by permission of Prof. M. Miyoshi.)
Araliaceae.

Aralia cordata Thunb.
Aralia sinensis Linn.
Acanthopanax divaricatum S. et Z.
Acanthopanax ricinifolium S. et Z.
Acanthopanax spinosum Miq.
Hedera Helix var. colchica C. Koch.
Helwingia japonica Dietr.

Umbelliferæ.

Angelica Miqueliana Maxim.
Angelica polyclada Franch.
Bupleurum falcatum Linn.
Bupleurum sachalinense Fr. et Sav.
Chamaele tenea Miq.
Cicuta virosa Linn.
Cryptotaenia japonica Hassk.
Hydrocotyle asiatica Linn.
Hydrocotyle rotundifolia Roxb.
Ligusticum acutilobum S. et Z.
CEnantho stolonifera DC.
Osmorhiza japonica S. et Z.
Pimpinella calycina Maxim.
Torilis japonica DC.

Yamazeni or Serimodoki.
Shishindo.
Mishimasaiiko.
Marubasaiko.
Sento-so.
DokuZeri.
Mitsuba.
Tsubokusa.
Chidomegusa.
Tokki.
Seri.
Yabuininjin.
DaiZeri or Takanotsune.
Yabujirami.

Cornaceæ.

Aucuba japonica Thunb.
Cornus ignorata C. Koch.
Cornus macrophylla Wall.
Marlea platanifolia S. et Z.

Aoki.
Kumanomizuiki.
Mizuki.
Urinoiki.

Clethraceæ.

Clethra barbiuervis S. et Z.

Riöbu.
Ericaceæ.

Enkianthus nikœnsis MAKINO.
Enkianthus japonicens Hook.
Pieris japonica D. DON.
Pieris ovalifolia D. DON.
Rhododendron indicum Sw. var. x Kæmpferi MAXIM.
Rhododendron sinense Sw.
Vaccinium bracteatum THUNB.
Vaccinium Buergeri MIQ.
Vaccinium hirtum THUNB.

Myrsinaceæ.

Ardisia japonica Bl.

Primulaceæ.

Lysimachia clethroides DUBY.
Lysimachia decurrens G. FORST.
Lysimachia Fortunei MAXIM.
Lysimachia japonica THUNB.
Lysimachia vulgaris LINN.

Styracaceæ.

Styrax japonica S. et Z.

Symplocaceæ.

Symplocos cratægoides HAM.

Oleaceæ.

Fraxinus Bungeana DC. var. pubinervis Wg.
Fraxinus longicuspis S. et Z.
Ligustrum japonicum THUNB.
Osmanthus Aquifolium B. et H.

Loganiaceæ.

Mitrascaræ polymorpha R. BR.

Ainai.
Gentianaceae.
Crawfurdia fasciculata Wall.  Tsururindo.
Halenia sibirica Bork.  Hana-ikari.
Swertia bimaculata Clark.  Akebonosō.
Swertia chinensis Franch.  Senburi.

Apocynaceae.
Trachelospermum jasminoides Lem.  Teikakazura.

Asclepiadaceae.
Cynanchum caudatum Max.  Ikema.
Pycnostelma chinensis Bge.  Suzusaiko.
Tylophora nikoensis Matsum.  Ko-kamomezuru.

Convolvulaceae.
Calystegia sepium R. Br.  Hirugao.
Cuscuta japonica Chois. var. thyrsoidea Engelm.  Nenashikazura.

Borraginaceae.
Cynoglossum furcatum Wall.  Orurisō.
Trigonotis peduncularis Benth.  Tabirako.

Verbenaceae.
Callicarpa japonica Thunb.  Murasashikishibu.
Clerodendron trichotomum Thunb.  Kusagi.
Phryma leptostachya Linn.  Hacidokusō.

Labiatae.
Ajuga decumbens Thunb.  Jurihitoe.
Calamintha chinensis Benth.  Kurumabana.
Calamintha gracilis Benth.  Tobana.
Comanthosphace sublanceolata S. Moore.  Fujitenminiso.
Elsholtzia cristata Willd.  Noginatakōjū.
Lamium album LINN.
Leonurus macranthus MAXIM.
Mentha arvensis LINN. var. piper-ascens HOLMES.
Mosla grosseserrata MAXIM.
Mosla punctata MAXIM.
Plectranthus glaucocalyx MAXIM. var. japonicus MAXIM.
Plectranthus inflexus VAHL.
Plectranthus longitubus MIQ.
Prunella vulgaris LINN.
Salvia japonica THUNB. var. bipinnata Fr. et Sav.
Salvia nipponica MIQ.
Scutellaria indica LINN. var. japonica MAXIM.
Stachys aspera MIChX. var. japonica MAXIM.
Teucrium japonicum WILLD.
Teucrium stoloniferum Ham. var. Miquelianum MAXIM.

Solanaceæ.

Lycium chinense MILL. KUKO.

Scrophulariaceæ.

Euphrasia officinalis LINN. var. vulgaris LEDEB.
Lindernia angustifolia WETTS.
Lindernia crustacea (L.) F. v. M.
Lindernia pyxidaria ALL.
Mazus rugosus LOUR. var. macranthus F. et S.
Mimulus nepalensis BENTH.
Pedicularis gloriosa BISS. et Moor.
Pedicularis resupinata LINN.
Pluteirospermum chinense BGE.
Scrophularia Patriniana WYDL.
Siphonostegia chinensis BENTH.

Odorikosō.
Kisewata.
Megusa.
Mizokōjū or himijiso.
Inukōjū.
Hikikokoshi.
Yamahakka.
Akikōji.
Usubogusa.
Akinotamurasō.
Kotojīsō.
Tatsunamisō.
Chorogidamashi.
Nigakusa.
Tsurunigakusa.
Kogomegusa.
Azetōgarashi.
Urinkusa.
Azena.
Sugigoke.
Mizohōzuki.
Hankwai-azami.
Shiogamagiku.
Koshigama.
Himenou-sutsubo.
Hikiyomogi.
Pl. VI. View of Mt. Fuji, seen from the Pacific coast; the coniferous, deciduous tree, and prairie, regions are visible. (After a photograph; a little brush is put in by the author in order to make the plant regions clear.)
Veronica cana Wall.
Veronica longifolia Linn.
Veronica spuria Linn.
Veronica virginica Linn.

Kuwagatasō.
Ruritoronoro-o.
Yamatorono-o.
Kukaisō.

Orobanchaceae.

Eginetia indica Roxb.

Gesneraceae.

Conandron ramosiodoides S. et Z. Iwatabako.

Acanthaceae.

Dicliptera crinita Nees.
Hygrophila lancea Miq.
Justicia procumbens Linn.

Hagurosō.
Oginotsume.
Kitsunenomago.

Plantaginaceae.

Plantago major Linn. var. asiatica Obako.

Rubiaceae.

Galium aparine Linn.
Galium asprellum Michx.
Galium brachypodium Maxim.
Galium gracile Bge.
Galium verum Linn. var. lacteum. Maxim.

Yayemugura.
Hosoba-ya-emu-gura.
Maruba-yotsubamugura
Yotsubamugura.

Kawaramatsuba.
Hosobayotsubamugura.
Kuchinashi.
Futabamugura.
Hashikagusa.
Hekusokazura.
Hakuchoge.

Caprifoliaceae.

Abelia spathulata S. et Z.
Diervilla floribunda S. et Z.
Diervilla grandiflora S. et Z.

Tsukubane-utsugi.
Nshikiutsugi.
Hakone-utsugi.
Diervilla japonica DC.
Diervilla Middendorfiana Carr.
Lonicera gracilipes Miq.
Lonicera japonica Thunb.
Lonicera Morrowii A Gr.
Sambucus javanica Bl.
Sambucus racemosa Linn.
Viburnum dilatatum Thunb.
Viburnum erousum Thunb.
Viburnum Sieboldi Miq.

Beni-utsugi or Tani-utsugi.
Ukon-utsugi.
Uguisukagura.
Suikasura.
Kinginboku or Hyotonboku.
Sokuzu.
Niwatoko.
Gamazumi.
Kobanogamazumi.
Gomaki.

Valerianaceæ.

Patrinia scabiosæfolia Link.
Patrinia villosa Juss.

Omina-eshi.
Otoko-eshi.

Dipsaceæ.

Scabiosa japonica Miq.

Matsumushisō.

Cucurbitaceæ.

Actinostemma racemosum Maxim.
Trichosanthes cucumeroides Maxim.

Gokizuru.
Karasu-uri.

Campanulaceæ.

Adenophora verticillata Fisch. var.
verticillata Fr. et Sav.
Campanula punctata Lam.
Codonopsis lanceolata B. et H.
Platycodon grandiflorus DC.
Phyteuma japonicum Miq.

Tsuriganeninjin.
Hotarubukuro.
Tsuruninzin.
Kikyō.
Shideshajin.

Compositeæ.

Achillea ptarmicoides Maxim.
Adenocaulon bicolor Hook.
Ainsliaea apiculata Sch. Bip.
Ainsliaea acerifolia Sch. Bip.
Anaphalis margaritacea B. et H.
Anaphalis yedensis Fr. et Sav.
Artemisia capillaris Thunb.

Shirobananokogirisō.
Nobuki.
Kikkōhaguma.
Momijihaguma.
Yamahahako.
Kawarahahako.
Kawarayomogi.
Artemisia japonica THUNB.
Artemisia Keiskeana MIQ.
Artemisia vulgaris LINN. var. indica MAXIM.
Aster fastigiatus FISCH. et MEY.
Aster indicus LINN.
Aster indicus LINN. var. pinnatifidus MAXIM.
Aster scaber THUNB.
Aster trinervius ROXB.
Atractylis ovata THUNB.
Bidens pilosa LINN.
Bidens tripartita LINN.
Cacalia Krameri (Fr. et SAV.)
Carpesium abrotanoides LINN.
Carpesium triste MAXIM.
Chrysanthemum sinense var. japonicum MAXIM.
Centaurea atriplicifolia (DC.)
Cirsium japonicum DC.
Cirsium spicatum (MAXIM.)
Eclipta alba HASSK.
Erigeron annuus PERS.
Erigeron canadensis LINN.
Eupatorium japonicum THUNB.
Eupatorium Kirilowii TURCZ.
Gerbera Anandria SCH. BIP.
Gnaphalium japonicum THUNB.
Gnaphalium multiceps WALL.
Iuula britanica DC.
Iuula salicina LINN.
Lactuca debilis MAXIM.
Lactuca denticulata MAXIM.
Lactuca stolonifera BENTH.
Lactuca Thunbergiana MAXIM.
Lactuca versicolor SCH. BIP.
Ligularia clivorum MAXIM.
Ligularia sibirica CASS.
Macroclinidium robustum MAXIM.
Pertya scandens SCH. BIP.
Picris hieracioides Linn. var. japonica Rgl.
Sauvurea Maximowiczii Herd.
Senecio campestris DC.
Senecio flammens DC.
Senecio nemorensis Linn. var. Fuchsii Koch.
Serratula coronata Linn.
Solidago Virga-aurea Linn.

Kōzorina.
Miyako-azami.
Sawa-oguruma.
Korinkwa.
Kion.
Tamura-sō.
Akinokirinsō.

b) Deciduous broad leaved tree-Region.

Next to the prairie-region, comes the deciduous tree-region. As we have stated above, it is most abundantly formed on the south side, while it is the least so on the north, in consequence of the climatic characters which we have already alluded to. Under this heading, therefore, it is sufficient for us to consider its southern formation.

Fig. 19. Fagus and Quercus in the winter.
The lower boundary of this region lies, on the south-east, at an altitude of 870 m; but on the due south side, it climbs as high as 1400 m., and on some parts it comes up even to altitudes of 1600 m.–1700 m. On the due south where this formation attains its most luxuriant growth, we see the gigantic forest principally formed of *Fagus*, *Zelkova* and *Quercus*, with thick under-growth, the ground being sufficiently capable of holding water. The tall *Fagus* with climbing *Rhus* and *Euonymus* reaching to the top of the tree, the *Stewartia* bare of

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*Fig. 20. Fagus and Quercus in the summer.*
bark, the thick foliage of Quercus and various shrubs forming a jungle over the under-growth,—all collectively form the most beautiful forest on this side.

A glance over this formation at the height of 1900 m. on the southern flank, will give us a general idea of it. The following description is drawn up from observations at the spot where I crossed in the summer of 1907. Over a little open space with the promontory of the Conifer-forest on the left side (east), the deciduous forest stretches away to the south upon a slope, so gentle that it seems at a distance perfectly flat, and the light green color of its foliage, in contrast with the dark green of the Conifers above, makes the forest still more remarkable. Far away, the prairie formation extends till it melts into the rice fields some miles distant. The several aspects of the vegetation of this region on the different sides are given in the accompanying photographs.

The forest-flora of this region is as follows:—

**Juglandaceæ.**

Juglans Sieboldiana Maxim. *Kurumi.*
Pterocarya rhoifolia S. et Z. *Sawagurumi.*

**Betulaceæ.**

Betula alba Linn. var. vulgaris DC. *Shiraikanba.*
Betula Ermanni Cham. var. nipponica Maxim. *Takekamba.*

**Fagaceæ.**

Fagus sylvatica Linn. var. Sieboldi Maxim. *Bunanoki.*
Quercus aliena Blume. *Naragashiwa.*
Quercus crispula Blume. *Onara.*

**Magnoliaceæ.**

Magnolia hypoleuca S. et Z. *Hōnoki.*
Trochodendraceae.
Cercidiphyllum japonicum S. et Z. Katsura.

Rosaceae.
Pyrus aucuparia G.ERTN. var. japonica MAXIM. Miyamananakanawulo.

Rutaceae.
Phellodendron amurense RUPR. Kikada.

Aceraceae.
Acer pictum THUNB. Tsutamomiji.
Acer palmatum THUNB. Yamamomiji.

Sabiaceae.
Meliosma myriantha S. et Z. Awabuki.

Tiliaceae.
Tilia cordata MIQ. Shinanoki.

Theaceae.
Stewartia monadelpha S. et Z. Himeshara.
Stewartia pseudocamellia MAXIM. Natsutsubaki.

Cornaceae.
Cornus ignorata C. KOCH. Kumanomizuki.
Cornus Kousa BUERG. Yamaboshi.
Cornus macrophylla WALL. Mizuki.

Clethraceae.
Clethra barbinervis S. et Z. Ryōbu.

Oleaceae.
Fraxinus longicuspis S. et Z. Ao-tago.
Fraxinus Sieboldiana BLUME. Shōji.
Caprifoliaceae.

Viburnum furcatum Blume.  
Mushikari or Obakamenoki.

The under-growth of the forests, shrubs and herbs found in the open places are as follows:—

Polypodiaceae.

Adiantum pedatum Linn.  
Kujakushida.

Aspidium muticum Fr. et Sav.  
Miyamakanawarabi.
Athyrium nipponicum Baker.
Microlepia Wilfordi Moore.
Nephrodium dilatatum Desv.
Nephrodium Filix-mas Rich.
Nephrodium Filix-mass Rich. var. lacerum Christ.
Nephrodium Filix-mas Rich. var. Sabæi Christ.
Nephrodium glanduligerum Makino.
Nephrodium hirtipes Hook.
Nephrodium Maximowiczii Baker.
Nephrodium Phegopteris Baumg.
Nephrodium thelypteris Desv.
Polypodium lineare Thunb. var. distans Makino.
Polypodium lineare Thunb. var. Omei Makino.
Polypodium senanense Maxim.
Polypodium trichomanoides Sw.
Polystichium tripterum Sm.

Hymenophyllaceæ.

Hymenophyllum Wrightii Bosch.
Trichomanes parvulum Poir.

Osmundaceæ.

Osmunda cinnamomea Linn.

Lycopodiaceæ.

Lycopodium cryptomerinum Maxim.
Lycopodium serratum Thunb.

Gramineæ.

Agrostis canina Linn.
Agrostis flaccida Hack.
Agrostis perennans Tuck.
Brylkinia caudata Fr. Schm.

Inuwarabi.
Ōrenshida.
Shiranewarabi.
Memma, Oshida, Miyama-inode.
Kumawarabi.
Miyamakumawarabi.
Miyama-itachishida.
Hashigoshida.
Iwahego.
Nantaishida.
Miyamawarabi.
Himeshida or Shorima.
Miyamanokish'īnolu.
Himenokish'īnolu.
Miyama-uraboshi.
Ōkuboshida.
Shūmokushida.
Calamagrostis sachalinensis Fr. SCHM.
Calamagrostis villosa MUT. var. Langsdorffii HACK.
Festuca ovina LINN.
Milletium effusum LINN.
Miscanthus Matsumurae HACK.
Muhlenbergia japonica STEUD. var. hakonensis HACK.
Sasa albo-marginata MAK. et SHIB.
Sasa paniculata MAK. et SHIB.

**Cyperaceae.**

Carex Døenitzii BOECK.
Carex pseudo-conica F. et S.
Carex remotia LINN.

**Juncaceae.**

Juncus Maximowiczii BUCH.
Luzula campestris DC. var. sudetica CLARK.

**Stemonaceae.**

Croomia japonica MIQ.

**Liliaceae.**

Hosta cerulea TRATT. var. lancifolia MATSUM.
Hosta Sieboldiana ENGL. var. longipes MATSUM.
Lilium avenaceum FISCH.
Lilium Hansoni BAK.
Maianthemum Couvallaria WIGG. et ROTH.
Metanarthecium foliatum MAXIM.
Paris quadrifolia LINN. var. obovata RGL.
Paris tetraphylla A. GR.
Polygonatum latifolium DESF. var. commutatum BAK.
Amadokoro.
Amadokoro.

Takeshinaran.
Takeshinaran.

Enriiso.
Enriiso.

Baikeso.
Baikeso.

**Orchidaceae.**

Cyripedium debile Reich f.
Ko-atsumorisō.

Ephiphanthus sachalinensis Reich. f.
Ko-ichiyōran.

Epipactis papillosa F. et S.
Yezosuzuran.

Gymnadenia cucullata Reich. f.
Miyamamojiru.

Gymnadenia cyclochaia Kors.
Kamomera no Ichiyōchidori.

Liparis Krameri F. et S.
Jigabachisō.

Listera cordata R. Br.
Kōfutabaran.

Listera Eschscholtziana Cham.
Futabaran.

Platanthera angustifolia Reich.
Mukagosō.

Platanthera mandarinorum Reich. f.
Yamasuqisō.

Platanthera ophryoides Fr. Schm.
Kisochidori.

Platanthera Yatabei Maxim.
Hosobanokisochidori.

Oberonia japonica Maxim.
Yorakuran.

Orchis Chondradenia Makino.
Onoiran.

Yoania japonica Maxim.
Shōkiran.

**Salicaceae.**

Salix gracilistyla Miq.
Nekoyanagi.

**Betulaceae.**

Corylus rostrata Ait. var. Sieboldiana
Tsunohashibumi.

Maxim.

**Urticaceae.**

Laportea bulbifera Wedd.
Mukago-irakusa.

**Caryophyllaceae.**

Stellaria nemorum Linn. var. Bungeana Maxim.
Miyamahakobe.
**Ranunculaceae.**

Aconitum Fischeri Reich.
Aconitum lycocotonum Linn.
Aquilegia glandulosa Fisch.
Cimicifuga biternata Miq.
Cimicifuga japonica Spr.
Clematis alpina Mill.
Coptis brachypetala S. et Z. var. pygmaea Miq.
Isopyrum stoloniferum Maxim.
Thalictrum aquilegifolium Linn.

**Papaveraceae.**

Corydalis decumbens Pers.
Corydalis Pallida Pers.

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Fig. 22. *Rodgersia podophylla* A. Gray, and *Cimicifuga foetida* Linn. var. simplex Huth., on the Yoshida side, about 1750 m. above the sea. The former plant is easily distinguishable in having its large whorled leaves, and the latter is very remarkable for its long spikes of white flowers. (From the Atlas of Japanese Vegetation, by permission of Prof. M. Miyoshi.)
Saxifragaceae.

Astilbe Thunbergii Miq.
Chrysosplenium macrostemon Maxim.
Hydrangea Hortensia DC. var. acuminata A. Gr.
Hydrangea Thunbergii Sieb.
Philadelphus coronarius Linn. var. Satsumi Maxim.
Ribes alpinum Linn. var. japonicum Maxim.
Ribes ambiguum Maxim.
Rodgersia podophylla A. Gr.
Schizophragma hydrangeoides S. et Z. Tiarella polyphylla Don.

Toriasliishoma.
Miyamanekonomeso.
Sawa-ajisai.
Amachanoki.
Satsumu-utsugi.
Zarikomi.
Yashabishaku.
Yamaguruma.
Iwagarami.
Zutayakusha.

Rosaceae.

Amelanchier asiatica C. Coch.
Fragaria elatior Ehrh.
Faurthiea villosa DCNE.
Prunus incisa Thunb.
Pyrus alnifolia Linn.
Pyrus Aria Ehrh. var. Kamaonensis Wall.
Pyrus aucuparia G.ERTN. var. japonica Maxim.
Pyrus Matsumuræ Makino.
Pyrus sambucifolia Ch. et Schl.
Rosa Lucie Fr. et Roch.
Rubus morifolius Sieb.
Rubus rosifolius Sm.
Rubus Sieboldii Bl.
Spiraea bulbata Maxim.
Spiraea japonica Linn. f.

Zaifuriboku.
Miyamahebi-ichigo.
Kamatsuka.
Mamezakura.
Azukinashi.
Urajironoki.

Miyanananakamado.
Nanakanado.
Takanenanakamado.
Hai-ibara.
Kumaichigo.
Bara-ichigo.
Horokuchiigo or. Oni-ichigo.
Koshimotsuke.
Shimotsuke.

Geraniaceae.

Geranium criostemon Fisch.
Geranium Wilfordi Maxim.

Gunnaifuuro.
Kofuuro.

Oxalidaceae.

Oxalis acetosella Linn.

Miyamakatabami.
Rutaceæ.

Zanthoxylum schimnifolium S. et Z. Inuzanshi.

Anacardiaceæ.

Rhus toxicodendron Linn. var. radi- 
caus Miq. Tota-urushi.

Aquifoliaceæ.

Ilex geniculata Maxim. Furinmunemodoki.
Ilex macropoda Miq. Aokada.

Celastraceæ.

Euonymus alata K. Koch. var. subtri-
flora F. et S. Komayumi.
Euonymus melanantha F. et S. Sawadatsu or Aogiku-mayumi.
Euonymus sachalinensis Maxim. Murasaki-tsuribana.

Staphyleaceæ.

Staphylea Bumalda S. et Z. Mitsuba-utsugi.

Aceraceæ.

Acer argutum Maxim. Asanohakaede.
Acer carpinifolium S. et Z. Yanashiba.
Acer crataegifolium S. et Z. Urikaede.
Acer micranthum S. et Z. Kominekade.
Acer nikoense Maxim. Chojanoki.
Acer purpurascens S. et Z. Kajikade.
Acer rufinerve S. et Z. Urihadakaede.
Acer Sieboldianum Miq. var. micro-
phyllum Maxim. Ko-hauchiwakaede.
Acer spicatum Lam. var. ukurun-
duense Maxim. Ogarabana.

Balsaminaceæ.

Impatiens nolitangere Linn. Ki-tsurijune.
Impatiens Textori Miq. Tsurifuneō.
Vitaceae.

Vitis Coignetiae PULL.  
Ganebu or Yamabudo.

Dilleniaceae.

Actinidia arguta PLANCH.  
Actinidia Kolomikta MAXIM.  
Actinidia polygama MIQ.  
Sarunashi.  
Miyamamatatabi.  
Mutatabi.

Violaceae.

Viola Bissetii MAXIM.  
Viola japonica LANGSD.  
Viola Maximowicziana MAKINO.  
Viola pinnata LINN. var. chærophylloides RGL.  
Viola variegata FISCH.  
Viola verecunda A. Gr. var. semilunaris MAXIM.  
Nagabasoishinsumire.  
Kosumire.  
Komiyamasumire.  
Ezo-sumire.  
Miyamasumire.  
Agisumire.

Onagraceae.

Ciræa alpina LINN.  
Cirœa erubescens Fr. et Sav.  
Epilobium dahuricum FISCH.  
Epilobium japonicum HASSK.  
Miyamatanitude.  
Tanitude.  
Hime-akabana.  
Iwa-akabana.

Araliaceae.

Aralia cordata THUNB.  
Acanthopanax sciadophyloides F. et S.  
Aralia repens (MAXIM.) MAKINO.  
Wudo.  
Koshiabura.  
Tochibanininjin.

Umbelliferae.

Angelica Florenti F. et S.  
Angelica polymorpha MAXIM.  
Carum Tanakæ Fr. et Sav.  
Seseli Libanostis KOCH.  
Sium Ninsi LINN.  
Shiranenjin.  
Shiranesenku.  
Iwasentōso.  
Ibuhibōfu.  
Makagoninjin.
Fig. 23. Forest of deciduous trees, on the Yoshida side, about 1500 m. above the sea. *Aralia cordata* Thunb. on the right, *Fraxinus longicuspis* Sieb. et Zucc. on the left, *Fagus, Quercus, Deutzia*, etc. are seen on the background. (From the Atlas of Japanese Vegetation by permission of Prof. M. Miyoshi.)

**Cornaceae.**

*Cornus Kousa* Buerg.  
*Yamabōshi.*

**Pirolaceae.**

*Chimaphila japonica* Miq.  
*Monotropa hypopitys* Linn. var. *hirsuta* Roth.  
*Mumegasasō.*  
*Shakujōbana.*
Monotropa uniflora Linn.
Pirola elliptica Nutt. var. minor Maxim.
Pirola media Sw.
Pirola renifolia Maxim.
Pirola rotundifolia L. var. albiflora Maxim.
Pirola secunda Linn.

Ginryōsō.
Kobano-ichiyakusō.
Maruba-ichiyakusō.
Tinyō-ichiyakusō.
Ichiyakusō.
Ko-ichiyakusō.

Ericaceae.
Andromeda campanulata Miq.
Gaultheria adenothrix Maxim.
Leucothoe Grayana Maxim.
Menziezia pentandra Maxim.
Pieris japonica D. Don.
Rhododendron dilatatum Miq.
Vaccinium bracteatum Thunb.

Furintsutsuji.
Akamono.
Hanahirinoki.
Koyōrakutsutsuji.
Asebi.
Mitsubatsutsuji.
Shushanpo.

Diapensiaceae.
Schizocodon soldanelloides S. et Z. Iwakagami.

Primulaceae.
Trientalis europaea Linn.
Primula japonica A. Gray.

Tsumatorisō.
Kurinsō.

Symplocaceae.
Symplocos crategoides Ham.

Sawafutagi.

Styracaceae.
Styrax japonica S. et Z.

Egonoki.

Oleaceae.
Ligustrum Ibeta Sieb.
Ligustrum Ibeta Sieb. var. ciliare Maxim.

Ibeta.
Miyama-ibota.

Gentianaceae.
Halenia sibirica Bornk.

Hana-ikari.
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**Labiatae.**

Calamintha multicaulis Maxim.  
Miyamatobana.

Plectranthus inflexus Vahl.  
Yamahakka.

**Scrophulariaceae.**

Lathraea japonica Miq.  
Yama-utsubo.

Pedicularis gloriosa Bisset et Moor.  
Hankwai-azami.

Pedicularis resupinata Linn.  
Shogamagiku.

**Gesneraceae.**

Conandron rhamondioides S. et Z.  
Iwatabako.

**Rubiaceae.**

Galium brachypodion Maxim.  
Marubanoyotsubamugura.

Galium paradoxum Maxim.  
Yotsubamugura.

Pseudopyxis longituba Fr. et Sav.  
Shirobana-inamori.

**Caprifoliaceae.**

Diervilla japonica DC.  
Benidusugi.

Viburnum dilatatum Thunb.  
Gamazumi.

Viburnum furcatum Blume.  
Mushikari.

Viburnum Wrightii Miq.  
Miyamagamazumi.

**Valerianaceae.**

Patrinia palmata Maxim.  
Kireikawa.

Patrinia villosa Juss.  
Otoko-eshi.

**Campanulaceae.**

Adenophora remotiflora Miq.  
Sobana.

Adenophora verticillata Fr. et Sav.  
Tsuriganeninjin.

Adenophora polymorpha Lede. var.  
Lamarckii Trautv.

Peracarpa circaeoides H. Fee.  
Himeshajin.

Phyteuma japonicum Miq.  
Shidashajin.

**Compositae.**

Adenocaulon bicolor Hook.  
Nobuki.

Ainsliea apiculata Sch.-Bip.  
Kikkohayuma.

Aster dimorphophyllus Fr. et Sav.  
Tateyamagiku.

Aster scaber Thunb.  
Shirayamagiku.
Aster trinervius Roxb.
Cacalia adenostylioides Fr. et Sav.
Cacalia delphiniifolia Sieb. et Zucc.
Cacalia farfaræfolia Sieb. et Zucc. var.
farfaræfolia Maxim.
Cacalia hastata Linn. var. glabra Leder.
Carpesium triste Maxim.
Cirsium spicatum (Maxim.)
Lactuca Raddeana Maxim.
Macroclinidium robustum Maxim.
Pertya scandens Sch.-Bip.
Prenanthes acerifolia (Maxim.)
Saussurea Maximowiczii Herd.
Saussurea Tanakæ Fr. et Sav. var.
phyllolepis Maxim.
Saussurea triptera Maxim.
Senecio nemorensis Linn. var. Fuchsi Kоч.
Solidago Virga-aurea Linn.

Yamashirogiku.
Kanikomori.
Momijisō.
Miyamakōmorisō.
Yōbusumaso.
Gankubiyabatabako.
Yama-azami.
Yamanigana.
Kashiwabahaguma.
Nagabanokōyabōki.
Fuku-ōsō.
Miyakoazami.
Tōhiren.
Yahazuhigotai.
Kion.
Akinokirinso.

Fig. 24. Coniferous forest on the north side of the mountain; Picea, and Abies, with a few deciduous trees on the right. (After a photograph.)
c) Ever-green Conifer-Region.

This is the most abundant vegetation on the mountain. As shown in the annexed map, the region forms a nearly complete belt around the middle of the mountain, the only intrusion of volcanic ashes being on the eastern side where this formation has almost disappeared. On the south, the formation begins at 1550 m. and stretches up to an elevation of 2300 m. On the north, it comes a little lower than on the south. Distant views of the region on the north and south are seen in Plates I., and VIII. As we have previously stated, there are some Conifer formations which come down to the prairie and are even isolated in it; such as the Aogigahara formation, the Kenmarubi formation, and the pure stand of *Picea polita* near lake Yamanaka.

On the south side of Part I., (cf. the foregoing sketch) on the lower boundary of this formation, there are found a few
Pl. VII. View of Mt. Fuji, seen from lake Saiko. (Nishi-lake.)  
(After a sketch by the author.)
Abies firma. Ascending to an altitude of 1500 m., we see that the prevailing Conifer in this region is Picea Veitchii with a small amount of Chamaecyparis, Tsuga and Picea hondoensis. In the Kamiide district of the same part, the predominating tree is Picea hondoensis with the addition of some Tsuga and Abies umbellata. Going over to the due west side, Picea Veitchii begins to increase, occupying 50% of the whole, leaving 30% to Tsuga, and 20% to Picea hondoensis. Coming up to Part IV., we see here the famous forest of Aogigahara,—a grand growth stretching over the large area of 14 km. from

Fig. 26. Mt. Fuji from lake Shōji, the Aogigahara forest is seen at the base of the mountain, and on the left the promontory of the tertiary formation is covered with thin clumps of Pinus densiflora. The pine on the left in the foreground is P. densiflora. (Photographed by the author.)
its upper to its lower end, and 5 km. from side to side. Although some local differences may be observed here, it is the Tsuga that controls the vegetation by so much as eighty percent, with much under-growth and with some additions of Chamaecyparis. This Chamaecyparis being tolerant of shade, can grow even in the dense forest of Tsuga. Picea polita and Pinus parviflora also intermingle here.

Fig. 27. Conifer forest of Aogigahara, near the top of the Konno pass. Conifers in the background are Picea polita, and Tsuga Sieboldii; the deciduous-tree in the foreground is Alnus incana. (Photographed by the author.)

Turning to the due north side, the Conifer formation stretches from 2000 m. down to 1500 m.; and presents a grand distant view making a belt around the peak. The predominating tree on this side is Tsuga especially in the vicinity of Maruyama, i.e. 70% of Tsuga and 20% of Larix. A little eastwards from here, we come to Yakikomi (cf. map.) where Larix predominates to such an extent that it ranges from 1500 m. up
to 2200 m., thus intercepting this ever-green formation. This Larix formation is clearly distinguishable by its fresh green colour in the early spring.

Moving to the eastwards, we see that the forest gradually becomes thinner. Some deciduous trees appear below the height of 1500 m. They are Fagus, Alnus, and a very large quantity of Sophora japonica Linn. On the due east side i.e. the Subashiri side, Larix attains its most luxuriant growth, and extends through all tree regions.
On the Gotemba side, the Conifer formation is the least developed and in some parts there are even almost no Conifers at all; but in other parts there is a pure red pine formation which ranges from 800 m. up to 1200 m.

The forest trees found in this region are as follows:

**Coniferae.**

- Abies homolepis S. et Z.
- Abies Veitchii Lindl.
- Abies umbellata Mayr.
- Dakemomi.
- Shirabi.
- Urajiromomi.
Fig. 33. Coniferous forest on the north side of the mountain, *Picea, Abies* and a few *Pyrus sambucifolia* on the right side. (After a photograph.)

Larix leptolepis GORD.  
Picea Alcockiana CARR.  
Picea ajanensis FISCH.  
*Picea hondoensis MAYR.  
Picea polita CARR.  
Pinus parviflora Sieb et Zucc.  
Tsuga diversifolia Maxim.  
Tsuga Sieboldiana CARR.  

Kurumatsu.  
Iramoni.  
Ezomatsu.  
Tohi.  
Harimoni.  
Himekomatsu.  
Komatsuga.  
Tsuga.

The undergrowth in this formation is almost the same as in the preceding formation.

**d) Larix region.**

Above a 2300 m. elevation of the Conifer region, the wind is too strong, cold, and dry for the growth of the ever

*I do not think that *Picea hondoensis* MAYR should be different from *Picea ajanensis* FISCH. The differences pointed out by MAYR in his "Abietinæ von Japan" is not very clear, and perhaps they should be regarded as individual characters."
green Conifers, and they give way to Larix which there forms the deciduous Conifer formation. Larix, being deciduous in the winter time, is tolerant of extreme dryness and severe cold. On the south, this Larix is found in as high as 2900 m. elevation. There it is seen clinging firmly to the ground, so as to prevent its being swept away by the wind as Pinus pumila does under the same conditions. This Pinus is very common in the alpine regions of Japan, but it is entirely absent on this mountain.

Fig. 31. Larix leptolepis on the western side (winter). (Photographed by the author.)

The plant-species found in this formation are almost the same as those in the following formation.
e) *Salix-Alnus Region.*  

At about 2500 m. elevation, the *Larix* formation gives way to the shrubbery-formation, such as *Salix, Alnus, Betula* and others. On the south this formation begins at 2600 m., mixed with *Larix*. On the north, it comes a little lower. The plants found in this region are as follows:

**Polypodiaceae.**

- *Nephrodium gracilescens* Blume, var. 
  *glanduligerum* Baker.  
  *Hashigoshida.*  
- *Nephrodium Phegopteris* Baumg.  
  *Miyamawaarabi.*

**Coniferæ.**

- *Juniperus nipponica* Maxim.  
  *Miyamanezu.*  
- *Larix leptolepis* Gord.  
  *Karamatsu.*

**Cyperaceæ.**

- *Carex Dænitzi* Bœck.  
  *Kotanukiran.*  
  *Himisuge.*

**Gramineæ.**

- *Agrostis canina* Linn.  
  *Iwagariyasu.*  
- *Glyceria tonglensis* Clark.  
  *Dojotsunagi.*  
- *Miscanthus Matsumuræ* Hack.  
  *Kariyasunmodoki.*

**Salicaceæ.**

- *Salix Caprea* Linn.  
  *Bakkoyanagi.*  
- *Salix Sieboldiana* Bl.  
  *Iwayanagi.*

**Betulaceæ.**

- *Alnus incana* Willd. var. *emarginata* 
  Matsum.  
  *Yukazuhannoki.*  
  *Miyamahannoki.*  
- *Betula alba* Linn. var. *vulgaris* DC.  
  *Shirakanba.*  
- *Betula Ermanni* Cham. var. *nipponica* 
  Maxim.  
  *Takekanba.*
**Polygonaceae.**

Polygonum cuspidatum S. et Z. *Itadori.*
Polygonum polymorphum Leder. var. japonicum Maxim.* Ontude.*

**Caryophyllaceae.**

Stellaria florida Fisch. var. angustifolia Maxim.* *Iwatsume kusa.*

**Ranunculaceae.**

Aquilegia glandulosa Fisch.* *Yamaodamaki.*
Clematis alpina Mill.* *Miyamahanshōzuru.*

**Cruciferæ.**

Arabis serrata F. et S.* *Fujihatazao.*

**Rosaceæ.**

Aruncus silvester Kostel.* *Yamabukishōma.*
Fragaria elatior Ehrh.* *Shirobanahēbūchigo.*
Pyrus sambucifolia Ch. et Schl.* *Takane-nanakamado.*
Rosa acicularis Lindl.* *Takanebara.*
Rubus japonicus Fock.* *Goyō-ichigo.*
Spiræa bracteata Maxim.* *Iwashimotsuke.*
Spiræa bulbata Maxim.* *Koshimotsuke.*

**Umbelliferae.**

Angelica Florenti F. et S.* *Shiranenininjin.*
Angelica hakonensis Maxim.* *Ivaninjin.*
Carum Tanakæ Fr. et Sav.* *Iwasentōso.*

**Ericaceæ.**

Leucothoe Grayana Maxim.* *Hanahirinoki.*
Menziezia pentandra Maxim.* *Kôjō rakutsutsuji.*
Rhododendron Metternichii S. et Z.* *Shakunange.*
Vaccinium Vitis-ideaæ Linn.* *Koke-momo.*
Tripetaleia paniculata S. et Z.* *Hotsutsuji.*
Pirolacæ.
Pirola media Sw.  
*Maruba-ichiyakusō.*

Diapensiaceæ.
Schizocodon soldanelloides S. et Z.  
*Iwakagami.*

Oleaceæ.
Ligustrum *Ibota* Sieb. var. ciliare  
*Maxim.*  
*Miyama-ibota.*

Valerianaceæ.
Patrinia palmata *Maxim.*

Orobanchaceæ.
Boschniakia glabra C.A. Mey.  
*Oniku.*

Campanulaceæ.
Adenophora remotiflora Miq.  
*Sobana.*
Adenophora verticillata Fr. et Sav.  
*Tsuriganeninjin.*

Compositæ.
Aster trinervius Roxb.  
*Yamashirogiku.*
Ainsliæa apiculata Sch.-Bip.  
*Kikkōhaguma.*
Cacalia adenostylioides Fr. et Sav.  
*Kanikōmori.*
Cacalia delphiniifolia Sieb. et Zucc.  
*Momijisō.*
Cacalia farfaræfolia Sieb. et Zucc. var.  
*Miyamakōmorisō.*
farfaræfolia *Maxim.*
Saussurea Maximowiczii Herd.  
*Miyako-azami.*
Saussurea triptera *Maxim.*  
*Yahasuhigotai.*
Solidago Virga-aurea Linn.  
*Akinotamurasō.*

f) Higher Grass Region.

Above the *Salix-Alnus* formation, there comes a small area of higher (alpine) grass formation. This formation is, however,
very poor on this mountain, owing to its recent habitation. The plants found here are as follows:

**Ophioglossaceae.**

Botrychium Lunaria Sw. *Himehanawarabi or Hebinoshita.

**Gramineae.**

Deschampsia caryophyllea L. *Nukasusuki.

**Cyperaceae.**

Carex Denitzii Béck. *Kotanukiran.
Carex stenantha Fr. et Sav. *Iwasuge.
Carex Wrightii Fr. *Himesuge.

**Orchidaceae.**

Orchis Chondradenia Makino. *Onoe-ran.
Plantanthera conopsea Schlecht. *Chidorisō.

---

Fig. 32. *Polygonum cuspidatum* Sieb et Zucc., on the Subashiri side, about 2000 m. above the sea. (From the Atlas of Japanese Vegetation, by permission of Prof. M. Miyoshi.)
Salicaceæ.
Salix Sieboldiana Bl.  
Iwayanagi.

Betulaceæ.
Alnus incana Willd. var. emarginata  
Matsum.  
Yahazuhannoki.
Alnus viridis DC. var. sibirica Rgl.  
Miyamahannoki.

Polygonaceæ.
Polygonum cuspidatum S. et Z.  
Itadori.
Polygonum debile Meisn. var. triangulare Meisn.  
Miyamataniisoba.
Polygonum polymorphum Ledeb. var. japonicum Maxim.  
Ontade.

Caryophyllaceæ.
Stellaria florida Fisch. var. angustifolia Maxim.  
Iwatsumekusa.

Ranunculaceæ.
Clematis alpina Mill.  
Miyamahanshôzuru.

Cruciferae.
Arabis serrata F. et S.  
Fujihatazao.

Leguminosæ.
Astragalus adsurgens Pall.  
Murasakimomenzuru.
Astragalus reflexistipulus Miq.  
Momenzuru.
Hedysarum esculentum Ledeb.  
Tateyama-ôgi or Iwa-ôgi.

Ericaceæ.
Cassiope licopodioides Don.  
Iwahige.
Leucothoe Grayana Maxim.  
Hanahirinoki.
Vaccinium Vitis-idaea Linn.  
Kôkemomo.
Pirolaceæ.

Pirola media Sw.  
*Maruba-ichiyakusō*.

Diapensiaceæ.

Schizocodon soldanelloides S. et Z.  
*Iwakagami*.

Compositæ.

Artemisia pedunculosa Miq.  
*Miyama-otokoyomogi*.

Circium purpuratum (Maxim.)  
*Fuji-azami*.

Solidago Virga-aurea Linn.  
*Akinokirinsō*.

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Fig. 33. *Circium purpuratum* (Maxim.), on the Subashiri side, about 2000 m. above the sea.  
(From the Atlas of Japanese Vegetation by permission of Prof. M. Miyoshi).

From 3220 m. upwards, there is no vegetation except a few mosses such as *Racomitrium canescens* Brid., *Stereodon brachycarpus* Mitt. *S. plicatus* Lindb., and a few lichens. On the
south, this grass region extends as high as 3220 m.; but on the north, it is limited under 3000 m. From this elevation upwards, the mountain is entirely barren and there is nothing to represent vegetation except a few lichens and mosses.

Fig. 34. Grass region on the north side of the mountain. (After a photograph).

V. GENERAL ASPECT OF THE FLORA OF THE MOUNTAIN.

Having arranged the plants according to their regions, let us consider the general aspect of the flora of the mountain. Summarizing all the flora, it is found to contain 900 species belonging to 125 families. The following table shows the number of species found in each region, and the sum of the species belonging to each family.
Regions.

<table>
<thead>
<tr>
<th>Families</th>
<th>Prairie</th>
<th>Forest regions, including deciduous trees and evergreen conifers</th>
<th>Shrubbery regions, including birch and Salix regions</th>
<th>Higher grass regions</th>
<th>Total number of species belonging to each family</th>
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<tr>
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<td>1</td>
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<td>1</td>
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<td></td>
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<td><strong>Lycopodiaceae</strong></td>
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*It should be understood that there may exist the same species in different regions and therefore the total number of species belonging to each family is the sum of different species represented in different regions, but not the sum of figures given in the different columns.*
Regions.

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Fig. 35. View of Mt. Fuji, seen from Ukishimanuma (Ukishima-swamp), forest regions are faintly visible. (after a photograph)
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<tr>
<td>Cucurbitaceae</td>
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<tr>
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<td>5</td>
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<tr>
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<td>20</td>
<td>8</td>
<td>3</td>
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</tr>
</tbody>
</table>
Among all the families, the largest is the Gramineae having 65 species; next come the Polypodiaceae and the Compositae, then the Cyperaceae, the Orchidaceae, the Ranunculaceae, and the Umbelliferae, each having more than 20 species.

Since we have as yet no complete list of other mountain-flora in Japan, we are not yet in a position to make a comparison between the floras of the volcano and other mountains. Still we may be justified in saying that the flora of the present mountain is much more limited than that of other mountains.

VI. INFLUENCE OF FIRE ON THE PRESENT VEGETATION.

On the basal part of the mountain which is near inhabited districts, fires often occur, intentionally or accidentally, and

Fig. 36. View of Mt. Fuji, seen from Yamanaka; dark forests of ever-green conifers are in sharp relief. (Phot. by the author).
sometimes destroy large portions of forest within a few hours. On this mountain, all the present prairie formations, except that of the Höyé part, where the ground is not yet ready to accept plants, would have been a spacious forest formation but for being constantly burnt and cut over. Cutting is also an active factor in changing forests into prairie. In former times, there were, we are told, rich clumps of trees on the present prairie on all sides; but in places near inhabited districts the cutting took place little by little, and thus in course of time, formed a broad prairie. As far as my observation goes, fire can not extend far upwards from the base. The flanking is much steeper in the middle portion of the slope than in the base, and on the steep flank, a strong wind is always blowing down from the top, thus preventing fires from spreading towards the peak. So, the deciduous forests may be destroyed by fire, but the coniferous forests are generally free from such destruction, owing to their situation. After considering all the cases, I am forced to the conclusion that the present prairie is due to fire, or cutting over, except those parts on the Gotemba side where the volcanic ashes are too fresh to support vegetation.

VII. ABSENCE OF *PINUS PUMILA* ON THE MOUNTAIN.

Ascending as high as 2500 m., one is struck with the singular habit of the *Larix* in clinging to the ground, and stretching its arms over it, owing to the strong wind which here prevails all the year through. It is interesting to observe that this *Larix*, which in the lower elevations has the habit of a tall erect trunk, is here so stunted and crushed down to
the ground as to render it liable to be mistaken for *Pinus pumila.*

In such high regions, *Pinus pumila* generally ranges over all the mountains of Japan. But on this mountain we have not found this pine thus far. The absence of the *Pinus* is worthy of special attention.

Considering the wind direction on the high mountains, where *Pinus pumila* grows, we find that the prevailing wind is south-westerly. But, of the neighbouring mountains which lie on the south-west of Mt. Fuji, there is none sufficiently high to support the *Pinus.* Therefore, the volcano has had no chance to get the seeds of *Pinus pumila* by the southwesterly wind, and this may be considered to be the cause of the absence of this tree on Mt. Fuji.

VIII. SUMMARY.

In the course of my several visits to the mountain, I have determined the difference of its vegetation according to altitude and exposure. So far as the exposure alone is concerned, the vegetation may be divided into two classes:—the northern and southern. On the northern slope, the conifer predominates, while on the south, the deciduous trees are in control. To ascertain the cause of this divergence, I have examined the physiography of the mountain and found that the divergence may be ascribed to the difference of the climatic factors, and principally to that of the saturation-deficits on the two sides. Next, I have considered the general aspect of the plant-formation, dividing the whole mountain into four parts, and describing

*The *Pinus* was erroneously recorded from the mountain by some authors.*
the formations separately. On the southern side, I have found that the forest-formation attains its most luxuriant growth at the 2000 m. elevation. Next, I have dwelt upon each region more particularly and stated the maximum and minimum limitations of the growth. Then, the zonation of plant-regions has been discussed zone by zone. The species of each region are mentioned and the lists of plants given. I have also summarized all the plants in one table, and given a short note on the general aspect of the flora of the mountain. The plants contained in the table are in all 739 species belonging to 96 families. Next, I have considered the effect of fires, and come to the conclusion that the present prairie is mainly due to forest-fires. Lastly, I have considered the cause of the absence of *Pinus pumila* and stated that the wind direction is not suitable for conveying the seeds of the *Pinus* from the neighbouring mountains to the volcano.

[The End.]
Pl. VIII. View of Mt. Fuji, seen from the top of the Misaka-pass (Misaka-tōge); forest regions are clearly seen between the snow, and prairie, regions. (Sketched from nature by the author, in April 1902.)
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