ENVIRONMENTAL EXTREMES AND ENDEMISM

LeRoy E. Detling

One of the striking features of the distribution of plant species is the effect produced by varying intensities of the major environmental factors, mostly climatic, upon the composition of the plant association, and suggests one basis for the delimitation of geographical areas in studies of plant speciation and distribution. This effect is the subject of the present paper.

Several years ago a transect through western and central Oregon was selected for special investigation. This transect is fourteen miles wide and extends from the mouth of the Siuslaw River on the Oregon coast in a general easterly direction to a point between Redmond and Prineville, a distance of about 160 miles. In its wide extent from the coastal dunes and headlands, through the humid slopes and high peaks of two mountain ranges, to the continental plateau of central Oregon, it probably includes as many and as varied environments as can be found within the same distance anywhere in the Pacific Northwest.

A profile of the transect (fig. 1) shows first, beginning at the western end, a narrow strip composed of dunes in various stages of maturity cut through on the north by Heceta Head, a massive

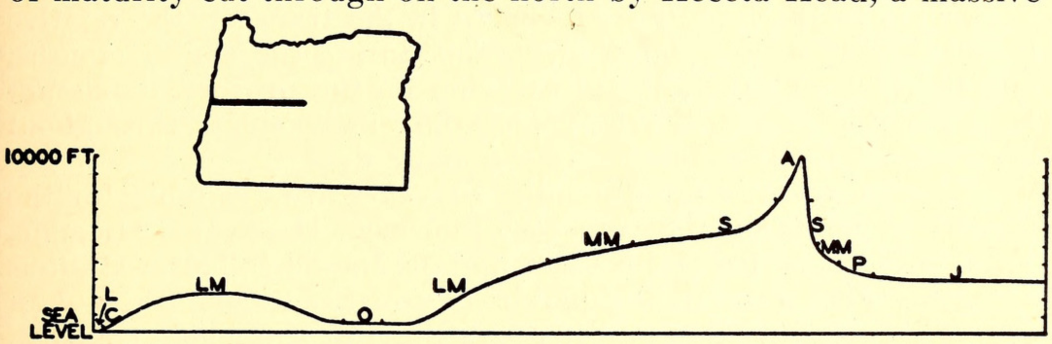

Fig. 1. Profile of the transect, showing relative positions of the vegetation zones.

igneous intrusion forming a rocky headland. This strip is flanked on the east by the relatively low Coast Range, whose highest points in this region do not exceed 3000 feet. Beyond this is the Willamette Valley, its floor averaging perhaps 450 feet in elevation. To the east of this valley rises the Cascade Range, deeply dissected by the valleys of the McKenzie River and its tributary, White Branch. In general, its peaks do not surpass 5000 or 6000 feet in altitude, with the highest points, the Three Sisters, slightly over 10,000 feet. East of the Cascades the transect extends out over a plateau of about 3200 feet elevation, from which rise several prominences. One of these, Powell Butte, reaches approximately 5600 feet.

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A striking variation in climate is due to the prevailing westerly winds from the Pacific Ocean which pass over two parallel mountain ranges, giving rise to an oceanic climate west of the Cascades with abundant rainfall and moderate temperatures at the lower altitudes and heavy snowfall in the higher mountains, and a continental climate on the plateau east of the Cascades with much reduced precipitation and greater extremes of temperature.

Climatic Factors

Source of the Data. The climatic data used in this investigation are based upon the annual summaries issued by the United States Weather Bureau. The factors which have been considered are: (1) average annual precipitation, (2) average precipitation for the combined months of June, July and August, (3) average minimum temperatures for the month of January, and (4) average of the maximum temperatures from April to September, inclusive.

Soil texture, slope of the terrain, conditions of light and shade, and other environmental factors have an important bearing on the constitution of the flora, but their effect in this area is largely local and they are left for later investigation. Some exception has been made in the case of soil salinity in the Littoral Belt, for reasons to be made clear later.

Owing to the large area included in the transect, the relative inaccessibility of the higher elevations during the winter months, and the lack of assistance in carrying on the project, it has not been feasible as yet to set up recording instruments throughout the transect for the collection of climatic data.

Climatic records for a number of years are available for the following points on the transect: Florence, Deadwood, Eugene, Vida, McKenzie Bridge, Sisters and Redmond. These stations are so located that it is possible to construct from their data curves for precipitation and temperatures for the whole transect. For some points in the higher elevations between McKenzie Bridge and Sisters, where local temperature differentials are important, it has been impossible to obtain these data directly. For this area temperatures have been computed on the basis of the general formula of a decrease of 3.3° F. for each increase of 1000 feet in altitude (Finch and Trewartha, 1942, p. 48). The gradients so computed are found to be in harmony with temperatures recorded from stations at comparable altitudes and locations in the Central Cascade area.

Precipitation. Annual rainfall (fig. 2) at the coast is about 70 inches; ascending the west slope of the Coast Range this increases to a maximum of over 90 inches, decreasing rather abruptly over the east or leeward slope to about 30 inches. On the west slope of the Cascade Range precipitation again increases from 37 inches at Eugene to 71 at McKenzie Bridge. East of the Cascade summit we again find a rapid decrease in annual precipitation, with 16 inches at Sisters, a few miles from the base of the mountains, and less than 8 inches at Redmond, 19 miles farther out on the plateau.

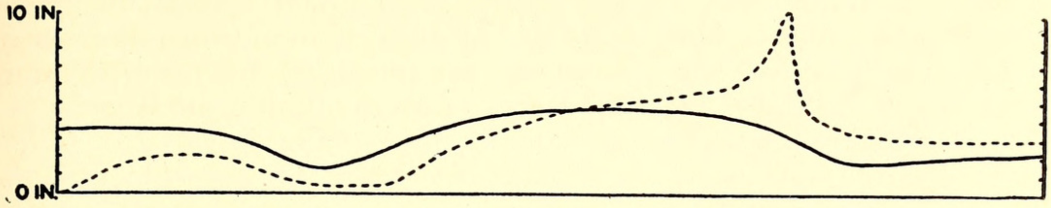

FIG. 2. Annual precipitation (transect profile in broken line).

From the standpoint of the maintenance of a particular flora the seasonal distribution of precipitation is extremely important. Throughout the transect most of the precipitation occurs during the months from October to April, but the amount of soil moisture probably does not become critical for any plant species before June. The term "summer rainfall" as used in this paper refers to the total for the months from June through August, by which time most of the vegetative growth and seed production of plants in this region have been completed.

The curve of summer rainfall for the transect (fig. 3) is similar to that of the total annual amount in that it shows two maxima, one on the west slope of each of the mountain ranges. The chief difference lies in the fact that the greater maximum of summer rainfall occurs in the Cascades rather than in the Coast Range.

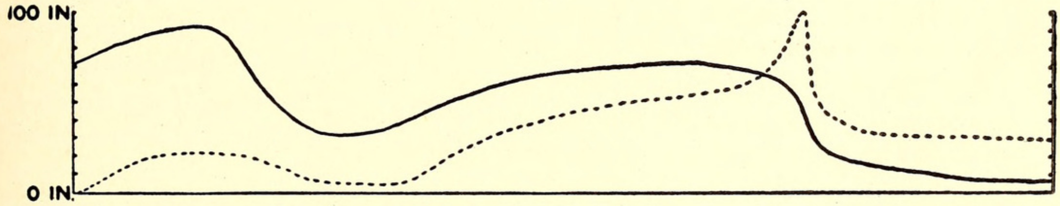

FIG. 3. Summer precipitation.

TEMPERATURE. The usual effect of low temperature in limiting the distribution of a plant species is winter-killing, and it is obvious in this case that it is the absolute low temperature which is actually the limiting factor. However, it would have been difficult, if not impossible, to obtain these particular data for most of the transect. For the purposes of comparison for which it is to be used in this study the average of the lowest temperatures for the coldest month of the year should reflect sufficiently well the extremes to which the winter temperatures fall in the various parts of the transect. The minimum temperatures referred to in the following pages are the averages for a period of years of the minimum temperatures recorded for the month of January, the month in which the lowest minima are recorded for all stations on the transect.

The importance of high temperatures for plant growth lies in the total amount of heat supplied in a given length of time. Here again, due to lack of recorded data, it has been impossible to determine this summation of temperature for any of the stations along the transect. Records are available, however, for the average maximum temperature for every month of the year, and the total of these temperatures during the growing season should reflect with sufficient accuracy for our purpose the variation in total solar heat among the vegetation areas under consideration. We have considered the months from April to September, inclusive, as the growing season. Instead of attempting to approximate a true summation of temperatures for this period we have reduced them to a more readily obtainable average of the maximum daily temperatures for the six months.

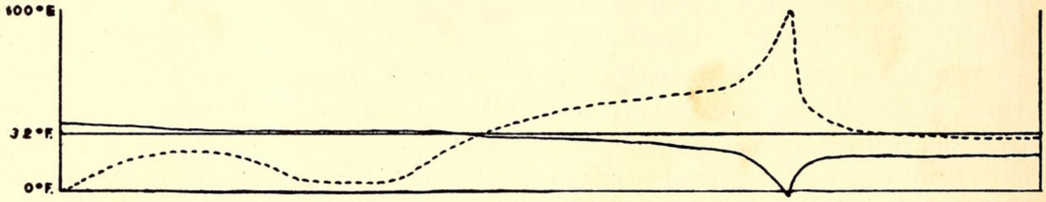

Fig. 4. Average January minimum temperature.

Disregarding local variations, we may make the following general statements regarding temperatures on the transect:

Average January minima (fig. 4) are highest at the coast, gradually falling as we go inland and as we ascend to the summit of the Cascade Range. East of the summit winter temperatures rise as we descend to the plateau, although even here they do not reach the high level prevalent over so much of the area west of the Cascades.

Maximum summer temperatures (fig. 5) are relatively low (64.1° F.) at the coast. These increase eastward over the Coast Range until a first maximum (75.6° F.) is reached in the McKenzie Valley, after which they decrease as one ascends the Cascade Range. On the east slope of this range summer temperatures again rise until the highest maximum for the transect (76.3° F.) is reached near Redmond.

Plant Associations

Data on the distribution of plant species are based largly upon collections and field observations made by the writer over a period of several years. This has been supplemented by study of other collections in the herbarium of the University of Oregon when the collectors' ecological data have been sufficiently full and definite to warrant their use. Distributional data drawn from collections made on the transect have been checked frequently by observations made in field work in adjacent localities in western and central Oregon.

The listing of species to be found on the transect is by no means complete. However, while continued field work will undoubtedly reveal more species, they will be scattered through all the associations, and their number will not be so great as to affect appreciably the relative value of the data or the conclusions to be drawn from them. This preliminary work is based upon 634 species and subspecies of spermatophytes, representing 275 genera.

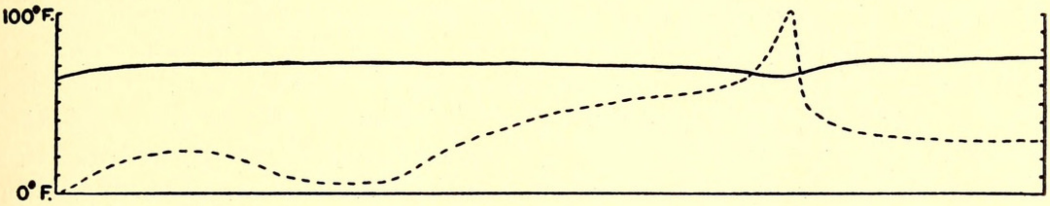

Fig. 5. Average summer maximum temperature.

The plant associations used in this study are the major ones of the region. They are the ones which have evolved in response to combinations of the major climatic factors. They sometimes coincide with forest types, where these mark the more important environmental differences. However, these larger units have not always been found useful as a basis for zone delimitation in the present study. In some cases a certain group of plant species is quite uniformly associated with a single dominant tree species, such as the western juniper. In the Douglas fir forest, on the other hand, the dominant species is accompanied by a well-marked association in its upper limits which is not found in its lower, each of these associations being clearly dependent upon certain climatic factors for its existence. The zones used here, then, have been determined not by the presence of any one indicator species, but rather by an association of species due to major climatic factors. Smaller associations, dependent upon local conditions, are not recognized.

In the following brief summary of the vegetation zones as treated in this study we have listed the "indicator association," i.e., the association of species characterizing that particular zone. It is, of course, to be understood that all the species here listed for any one indicator association may not always be present in that association. On the other hand, the presence in a given area of only one or two members of an indicator association cannot always be considered sufficient to mark the existence of the zone in which they ordinarily occur.

Littoral Belt. This belt is restricted to the coastal dunes, headlands and tide flats, where the vegetation is subjected to the constant winds, shifting sands, brackish water, salt spray and other direct influences of the ocean. Its indicator association is composed of *Carex macrocephala, Convolvulus soldanella, Lupinus littoralis, Abronia latifolia, Lathyrus littoralis, L. maritimus, Glehnia leiocarpa, Fragaria chilensis* and *Potentilla anserina.*

COASTAL FOREST. In that section of the Oregon coast covered by the transect this association extends but a short distance inland from the previous one. It is better developed and more extensive farther northward. On the whole, it is a dense forest. Climatic conditions are favorable to the formation of sphagnum bogs. The zone is marked by the presence of *Picea sitchensis, Pinus contorta, Myrica californica, Salix Hookeriana, Vaccinium ovatum, V. uliginosum, Chrysamphora californica* and *Ledum columbiananum.*

OAK WOODLAND. This type occurs in relatively small areas in the Willamette Valley and on the lower west slopes of the Cascades. It frequently occurs as a successional stage preceding the Lower Montane Forest, but at other times is apparently the climax association, and as such constitutes a northern extension of the deciduous woodland of the Umpqua and Rogue River Valleys of southern Oregon. The zone is here taken to include the open meadows and grasslands and exposed rocky hillsides, whose flora includes largely the same species as those found in the woodland proper. Indicator association: *Quercus Garryana, Q. Kelloggii, Arbutus Menziesii, Rhus diversiloba, Rosa nutkana, Potentilla gracilis, Dichelostemma pulchellum* and *Fritillaria lanceolata.*

LOWER MONTANE FOREST. This comprises the Douglas fir forest from its lower limit up to an altitude of about 4000 feet. It does not occur on the east slope of the Cascade Range. The indicator association is made up of *Pseudotsuga taxifolia, Acer circinatum, Cornus Nuttallii, Vaccinium parvifolium* and *Berberis nervosa.*

MIDDLE MONTANE FOREST. The Douglas fir forest from about 4000 feet to its upper limit, while containing many of the species found in the preceding zone, is characterized by the presence of a number of species not found in its lower elevations. This zone occurs on both slopes of the Cascades, but the areas occupied by it on the two slopes are separated from one another by the Subalpine Forest above them. On the east slope *Pseudotsuga* is largely replaced by *Abies grandis.* Characteristic species of the Middle Montane Forest are *Pseudotsuga taxifolia, Abies grandis, A. procera, Acer glabrum, Garrya Fremontii, Gaultheria ovatifolia, Vaccinium membranaceum, Calochortus Lobbii, Eriogonum compositum* and *Cornus canadensis.*

SUBALPINE FOREST. The Subalpine Forest occupies a relatively narrow strip along the summit of the Cascades, extending up to timberline, and occurs on the summits of some of the more isolated peaks that rise up out of the lower zones, such as Horsepasture and Carpenter Mountains. The association marking the zone is made up of *Tsuga Mertensiana, Abies lasiocarpa, A. amabilis, Pinus contorta Murrayana, P. albicaulis, Vaccinium scoparium, Phyllodoce empetriformis, Cassiope Mertensiana, Luetkea pectinata* and *Vaccinium deliciosum.*

Alpine Tundra. All vegetation above timberline may well be included in a single association. On this transect, tundra is restricted to a few peaks which reach about 7000 feet elevation or more. The highest of these are the North and Middle Sisters, both of which slightly exceed 10,000 feet. The indicator association of this zone consists of *Hulsea nana, Collomia Larsenii, Polemonium elegans* and *Oxyria digyna.*

Ponderosa Pine Forest. The whole belt dominated by ponderosa pine is included in this zone. It occupies the lower east slopes of the Cascades and the adjacent plateau, extending approximately from 3200 to 4000 feet. Its indicator association is composed of *Pinus ponderosa, Purshia tridentata, Ceanothus velutinus* and *Arctostaphylos patula.*

Juniper Woodland. This association occupies the plateau adjoining the Ponderosa Pine Forest. Its flora is essentially the same as that of the sagebrush plains or desert shrub formation to the east, but includes a notable stand of western juniper. The zone is characterized by the presence of *Juniperus occidentalis, Artemisia tridentata, Chrysothamnus* spp., *Astragalus* spp. and *Lupinus corymbosus.*

Hereafter, the names of these zones may be abbreviated as follows: L, Littoral Belt; C, Coastal Forest; O, Oak Woodland; LM, Lower Montane Forest; MM, Middle Montane Forest; S, Subalpine Forest; A, Alpine Tundra; P, Ponderosa Pine Forest; J, Juniper Woodland.

In any consideration of the effectiveness of the environment in determining the constitution of a given plant association we must have some acceptable criterion for judging the distinctness of that association, i.e., the degree of difference between it and any other association. The most reasonable basis for such judgment would seem to be the number of species endemic in any given association or zone. If environmental selection has been rigorous we should expect to find more highly specialized species comprising the flora of an area, in other words, more species which can grow only in that set of environmental conditions. The actual number of species endemic in an association is, of course, less significant than the percentage which these comprise of the total number occurring in it. The term "endemic," as employed here, simply means restricted to the area in question, with no reference to breadth or narrowness of range, or any other peculiarities of distribution. The number of endemics for each zone of our transect, and the percentage which this number represents in the total flora of that zone are shown in the following table:

Table 1. Percentage of Endemism in the Vegetation Zones

	No. endemic species	% of total
Littoral Belt	27	51
Coastal Forest	14	17
Oak Woodland	61	41
Lower Montane Forest	74	27
Middle Montane Forest	12	7
Subalpine Forest	69	43
Alpine Tundra	9	53
Ponderosa Pine Forest	20	27
Juniper Woodland	57	64

On the basis of these figures the Juniper Woodland is the most distinctly marked of all the associations, followed by the Alpine Tundra and the Littoral Belt, while the Middle Montane Forest is the least so.

The Association-Environment Relation

This relationship between the vegetation zones and the various environmental factors is best observed when the east and west slopes of the Cascade Range are treated separately. The following two tables (tables 2 and 3) present for each vegetation belt the range of each of the four climatic factors under consideration here. Since the Middle Montane is a discontinuous zone, the ranges of its climatic factors are treated separately for its east and west slopes. In the case of the Subalpine Forest and Alpine Tundra, since their areas are continuous over the summit, the ranges of the climatic factors include the extremes for both slopes. Precipitation is given in inches, temperatures in degrees Fahrenheit.

The data of the foregoing tables can be translated into graphs so constructed as to show the relative position of each zone in the whole range of any given climatic factor (figs. 6 and 7). The vegetation zones on each slope are arranged in ascending order from the lowest in elevation to the highest. The left-hand margin of the graph represents in each case one extreme of each of the factors, and the right-hand margin the other extreme. Each bar of the graph represents that portion of the total range of a factor which is included within the zone indicated, as well as its relative distance from each of the extremes.

Bearing in mind the figures of Table 1, on the degree of endemism in the flora of the various associations, an examination of the foregoing graphs reveals some interesting and significant facts.

Considering first the east slope, it will be noted that the highest percentages of endemism occur at the extremes of the slope, viz., 64% in the Juniper Woodland and 53% in the Alpine

Tundra. Endemism decreases as one approaches the middle altitudes, with 43% in the Subalpine Forest and 27% in the Ponderosa Pine Forest. The lowest degree of endemism, 7%, is found in the zone which occupies the middle position on the slope, i.e., in the Middle Montane.

TABLE 2. RANGE OF CLIMATIC FACTORS IN THE EAST SLOPE ZONES

	Annual precipitation	Summer precipitation	January min. temp.	Summer max. temp.
J	7.7–16.7	1.7–2.0	20.0–20.8	72.9–76.3
P	16.7–24.5	1.7–2.5	17.4–20.0	71.1–72.9
MM	24.5–45.0	2.5–3.2	15.5–17.4	69.8–71.1
S	45.0–71.2	3.0–4.6	6.2–15.9	63.7–70.0
A	36.0–64.5	3.0–3.9	-1.8– 7.2	57.3–63.7

TABLE 3. RANGE OF CLIMATIC FACTORS IN THE WEST SLOPE ZONES

	Annual precipitation	Summer precipitation	January min. temp.	Summer max. temp.
L	69.4	3.5	38.5	64.1
C	69.4–72.0	3.5–4.0	38.0–38.5	64.1–64.5
O	32.0–40.0	1.5–2.5	32.1–34.5	72.0–72.5
LM	32.0–92.0	1.5–4.6	20.9–38.0	64.5–75.6
MM	66.0–72.0	3.9–4.6	15.9–20.9	70.0–72.5
S	45.0–71.2	3.0–4.6	6.2–15.9	63.7–70.0
A	36.0–64.5	3.0–3.9	-1.8– 7.2	57.3–63.7

Now it may be noted that the climatic factors also form a gradient on the slope, with the greater number of extremes occurring in the Juniper Woodland and Alpine Tundra, the least extreme conditions being found in the Middle Montane. More specifically, all four climatic factors reach one of their extremes in the Juniper Woodland. In the Alpine Tundra two factors, January minimum and summer maximum temperatures, reach one extreme, and the amount of precipitation is exceeded in only one other zone. In the Subalpine Forest the two precipitation factors are at one of their extremes while the summer and winter temperatures are roughly about midway of their extremes. The general average of extremeness for all factors is less in the Subalpine Forest than in the Tundra. In the Ponderosa Pine Forest only one factor reaches an extreme. In the middle Montane Forest no factor is at its extreme; the graph shows all the bars for this association to be grouped fairly well toward the mid-points of the factor ranges for the whole gradient.

On the west side of the Cascade divide, if we leave for later consideration the Littoral Belt and Coastal Forest, we find a situation quite comparable with that on the east slope, in that we

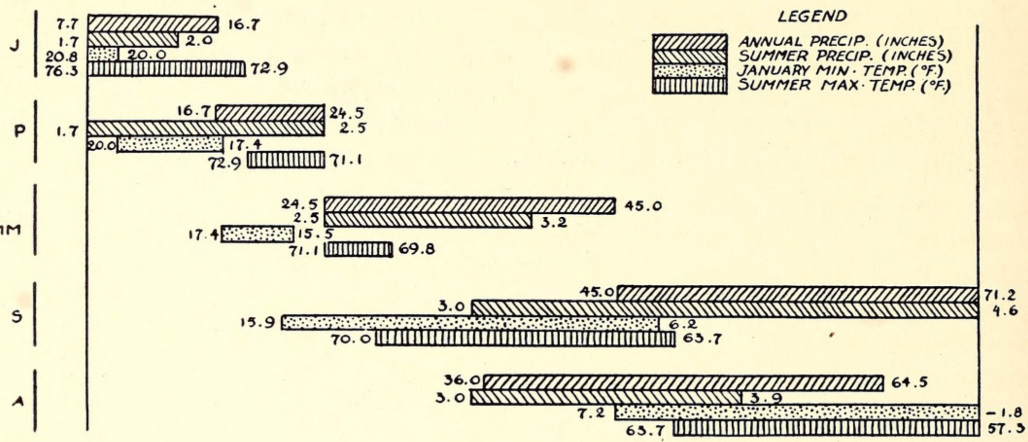

Fig. 6. Range of climatic factors in the east slope zones. (Based on Table 2). J—Juniper Woodland. P—Ponderosa Pine Forest. MM—Middle Montane Forest. S—Subalpine Forest. A—Alpine Tundra.

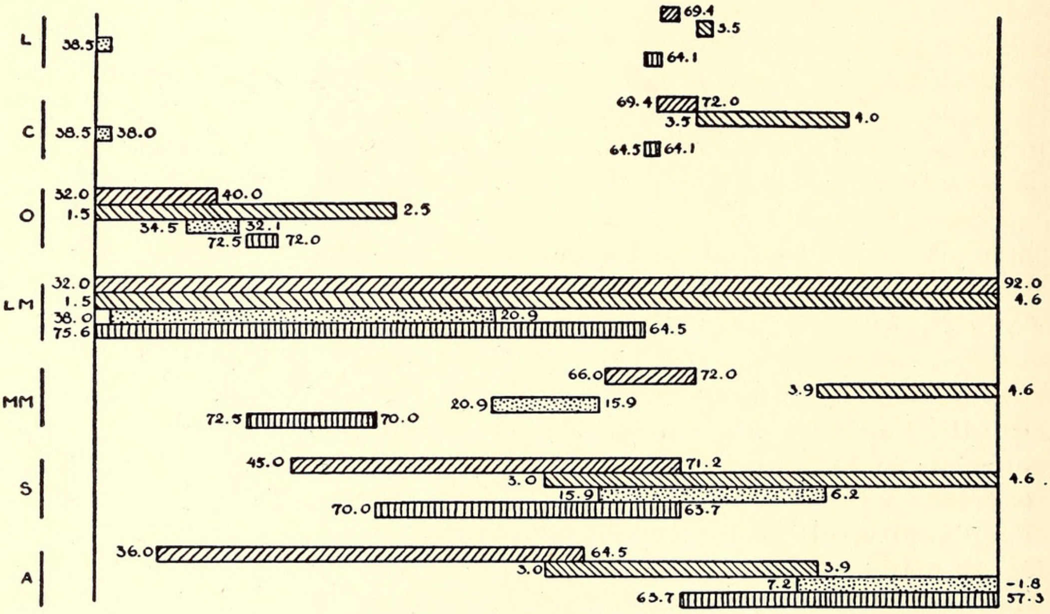

Fig. 7. Range of climatic factors in the west slope zones. (Based on Table 3). L—Littoral Belt. C—Coastal Forest. O—Oak Woodland. LM—Lower Montane Forest. MM—Middle Montane Forest. S—Subalpine Forest. A—Alpine Tundra.

have a gradient of climatic factors from the Oak Woodland up to the Alpine Tundra, coupled with a high degree of endemism in those plant associations where most of the climatic extremes occur and a low degree of endemism where climatic conditions are for the most part moderate. The Tundra combines the highest degree of endemism, 53%, with extremes in both summer and winter temperatures and moderate precipitation. The Subalpine Forest and Oak Woodland have almost the same degree of endemism, 43% and 41% respectively. In the former it will be noted that one factor, summer rainfall, reaches one of its extremes, while the lower extremes of both summer and winter temperatures in this zone are surpassed only in the adjacent Tundra. The graph shows how in the Oak Woodland all factors are grouped at or near one of their extremes. The Lower Montane Forest is moderate in degree of endemism (27%) ; two of the climatic factors, annual and summer precipitation, cover in this one association the entire range for the west slope, while temperatures range from an extreme at one end well up into the middle portion of the total gradient. The Middle Montane Forest, with only 7% endemism, the lowest on the slope, has an extreme in only one factor, viz., summer rainfall, the other three being scattered through the middle portion of their ranges in this zone.

The foregoing data lend support to an hypothesis which, in-so-far as this transect and the four climatic factors under consideration are concerned, might be stated thus: The degree of endemism in the flora of a given area is directly correlated with the total number of environmental factors reaching their extremes in the area. The greater the number of factors which reach or approach one of their extremes in an area, the greater will be the degree of endemism in the flora of the area.

Two questions regarding the west slope associations present themselves. The first and undoubtedly the most obvious one is: Why does the Lower Montane Forest have only 27% endemism when the association embraces not only one extreme of summer maximum temperature and practically one extreme of January minimum temperature, but also *both* extremes of the two precipitation factors? The answer lies in the very fact that climatic conditions in the association are so varied that they do reach both extremes or at least have a very wide range. It will be noted that in the graph the bars for the Lower Montane Forest overlap all or many of the corresponding bars in adjacent associations. This means that in the various parts of its wide range where the climate approaches that of other associations there will be an exchange of species between the zones with a resultant decrease in the number of endemic species.

The second question arises when it is noted that in the Oak Woodland the range of each climatic factor is entirely overlapped by the range of the same factor in the Lower Montane Forest. Since the climate of the Oak Woodland is thus reproduced in certain parts of the Lower Montane Forest why does not this area support such a forest? The answer may be sought in the fact that all the factors in the woodland are so near to the extremes present in the Lower Montane that any other environmental condition that increases the effect of one of these extremes will be sufficient to change the whole plant association. Such a condition is the shallow soil frequently found on the low hills of the

Willamette Valley, as well as increased insolation due to slope of the terrain. Early drying of these soils decreases the effectiveness of annual and summer precipitation and shifts an already marginal Lower Montane Forest into an Oak Woodland. It is worthy of note that in the Umpqua and Rogue Valleys, where the Oak Woodland occupies a much deeper soil, the annual and summer precipitation both fall below the lowest extremes for these factors in the Willamette Valley.

Consideration of the Coastal Forest and the Littoral Belt has been left for this time since the climatic factors in these associations do not form a part of the regular climatic gradient on the west slope of the Cascades. In the case of the Coastal Forest, however, as the graph shows, only one of its climatic factors, viz., January temperature, approaches an extreme, the others being definitely median in their position. It is therefore in keeping with the hypothesis advanced above that the distinctness of the flora in this forest is represented by only 17% of endemism.

At first glance the Littoral Belt would seem to offer an exception to our hypothesis. Its climatic factors have practically the same positions as do those of the Coastal Forest, yet the Littoral flora has an endemism of 51%, second only to that of the Alpine Tundra among the west slope associations. However, bearing in mind that one of the main features of the environment of the Littoral Belt is soil salinity of such degree as to create a condition of extreme physiological drought, we see that actually the availability of both annual and summer precipitation is so modified that we could well consider them to be at their lower extreme here. This low extreme of available soil moisture, coupled with the upper extreme of winter temperature, and the fact that summer temperatures are lower here than in any association except the Subalpine Forest and the Tundra, may easily explain the high degree of endemism in the Littoral association.

Since the summation of environmental extremes is so clearly reflected in the distinctiveness of floras in various geographical areas, this should be taken into account in our studies on the evolution of floras. To one familiar with areas of endemism, a survey of climatic maps shows that the centers of floral areas richest in endemic species coincide with areas in which occur the end points of a number of climatic gradients. It is clear that our investigations on species distribution and the evolution of species and subspecies should be based upon climatic areas so constituted. As a specific example, taxonomic and distributional studies on one of the sections of the genus *Lupinus,* well represented and widespread in the Pacific Northwest, are being carried on by the writer. These studies have this type of area as their basis, and it has been found that the geographic pattern of species and subspecies follows closely the pattern of summations of environmental extremes.

Summary

The degree of endemism in the nine major plant associations on a transect through western and central Oregon is compared with annual precipitation, summer precipitation, January minimum temperature and summer maximum temperature in the same associations. It is found that the higher percentages of endemism occur in those associations in which the greater number of climatic factors reach one of their extremes. The hypothesis is advanced that the degree of endemism in the flora of a given area is directly correlated with the total number of environmental factors reaching their extremes in the area. It is pointed out that the centers of floral areas richest in endemic species coincide with areas in which occur the end points of a number of climatic gradients, and it is suggested that taxonomic and distributional studies be based upon geographic areas constituted along these lines.

Museum of Natural History,
University of Oregon, Eugene

Literature Cited

Finch, V. C., and G. T. Trewartha. 1942. Elements of geography, physical and cultural. 2nd Ed.

NOTEWORTHY SOUTH AMERICAN PLANTS, I AND II

Paul C. Standley and Fred A. Barkley

In working over portions of recent collections of plants from Peru and Bolivia collected by H. E. Stork, O. B. Horton, W. J. Eyerdam, J. Soukup S. S., C. Vargas C., and T. H. Goodspeed, five specimens have appeared which are sufficiently distinct from the known species of that area that they seem worthy of description. The types of these are all deposited in the Herbarium of the Chicago Natural History Museum.

Phoradendron Storkii Barkley, sp. nov. Frutex glaber, parasiticus, dioicus; foliis coriaceis, lanceolatis, oppositis, 130 mm. longis, 20 mm. latis, basi cuneatis, decurrentibus, subsessilibus, apice obtusis, 3–5-nerviis; cataphyllis 2, late deltoideis, ad nodum primum ramis primarii; internodiis basi tetrangularibus (infimis exceptis), apice planis et late alatis (alis caulies latitudine aequantibus); inflorescentiis erectis et in axillis foliorum solitariis; pedunculis circa 5 mm. longis; bracteis 2 inflorescentiam subtendentibus; inflorescentiis 1 ad 3 cm. longis; petalis 3.

Shrubby, dioecious parasite on trees with stems to 60 cm. long, nodes of stem yellow and the remainder of stem and leaves chlorophyll green; leaves thinly coriaceous, lanceolate, opposite, 130 ±