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The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

TWO ECOLOGICAL PROBLEMS IN SALIX DISTRIBUTION

By Carleton R. Ball

1944

- - - - -

Two peculiar and presumably ecological problems in the distribution of North-American certain species of Salix have confronted the writer for several years. One problem is concerned with two unrelated species having an extremely extended, but fairly continuous, distribution from south to north. The other problem is presented by two unrelated species which have a fairly extensive but discontinuous distribution from east to west. By "unrelated" is meant that the two members of each pair belong to quite diverse sections of the genus. The geographical direction of distribution given above is from the region of greater abundance toward that of increasing scarcity and final disappearance.

~~XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX~~

It is hoped that plant ecologists may be able to throw light on the peculiar factors governing these ~~unusual~~ plant distributions.

Extremely Extensive North-South Ranges

The two species of Salix with extremely extended south-north distribution are S. lesiandra (with its hairy-twiggged variety lancifolia) and S. interior (with its narrow-leaved variety pedicellata). Both species range from the latitude of northern Mexico (30° - 32° N.) to the Arctic Circle or beyond (67° N.), or some 2500 miles or more. In each case, the species and almost the variety occur together ~~XXXXXXXXXX~~ throughout the entire distance.

Completely rewritten Apr. 14, 1948

1. Salix lasiandra Benth., ~~subsp.~~ the Pacific Willow, and its hairy-twigged variety, lancifolia (Andersson) ^Webb, occur from northwestern Mexico to Alaska and Yukon. From the arid climate of Baja California and southern California, they pass northward abundantly throughout California, Oregon, Washington, western Nevada, and Idaho. ~~A~~long finger of sparse distribution extends eastward across the northern portions of Arizona and New Mexico and the adjacent southern parts of Colorado and Utah. In Canada, they extend northward, with decreasing abundance, across mountainous British Columbia and western Alberta and eastward into the prairies as far as east-central Saskatchewan and thence north at least to the west end of Lake Athabaska in northeastern Alberta.

Farther north and west, the species occurs on the lower Stikine River in northwestern British Columbia near the international boundary north of Wrangell, again on the headwaters of the Chilkat River at the northern tip of the Alaskan "Panhandle", and finally on the lower Yukon River below Holy Cross. Species and variety occur together ~~mostly~~ at several points on the Yukon and Klonoke Rivers in the Dawson area (64° N) of Yukon. In Alaska proper, the variety, without the species, has been found along the Yukon River at Ft. Yukon (Arctic Circle), Tanana (65° N), Blackburn, and Holy Cross (62° N, 160° W); ~~and below;~~ on the tributary Tanana River at Salcha Slough, Fairbanks, and Nenana; and also at Matanuska, in south-central Alaska at the head of Cook Inlet.

This distribution covers about 35 degrees of latitude (32° N to almost 67° N). It extends across the Lower and Upper Sonoran, Transition, Canadian, and Hudsonian Life Zones, ^{and} almost touches the Arctic Zone at various points along the Yukon River from Dawson to Holy Cross. The distribution from northwestern British Columbia and the southeastern Alaska "Panhandle" to Yukon and Alaska proper is fairly continuous. Similar continuous distribution from Lake Athabaska northwestward across the wide expanse of Peace and Liard Rivers drainage is in doubt. While not yet reported from this area, collecting has been sufficiently widespread to prove its absence.

2. Salix interior Rowlee, and its narrow-leaved variety pedicellata (Andersson) Ball, range northward from the mouth of the Mississippi River (30° N) across the United States and Canada to slightly beyond the Arctic Circle in Alaska. Westward of the Mississippi, they (and especially the variety) fan out across the Great Plains to the western boundary of Texas, Nebraska, and the Dakotas, then northwestward in northern Montana and southern Alberta, and northward in the Athabaska River drainage to Lake Athabaska. Eastward, the species ranges up the Ohio Valley, across the mountains, down the Potomac to the District of Columbia, and thence northeastward to Delaware, New Hampshire, New Brunswick, and Quebec. Thence the line runs west to southern Manitoba and northwestward to Lake Athabaska at its western end in northeastern Alberta, the species and variety occurring together in the Prairie Provinces.

In the Mackenzie River^(Arctic) drainage basin of southern Mackenzie, the species (and occasionally the variety) occurs on the Slave River (Ft. Smith), on Great Slave Lake (Hay River), and the Mackenzie River (Ft. Simpson, Ft. Wrigley, 63° N, 123° W). Westward, on tributaries of the Mackenzie, the species has been found at the mouth of the Nahanni River (61° N, 124° W), at Ft. Liard on the Liard River (60° N, 124° W), and on the Upper Liard River at 60° N. This is at about 128° W and near the U.S.-Yukon boundary.

In Pacific drainage, the species and variety occur in British Columbia, Yukon, and Alaska. In northwestern British Columbia, the species has been found once on the Stikine River near the Alaskan border north of Wrangell. In Yukon, species and variety occur at several points on the Yukon and Klondike Rivers within some 20 miles of Dawson (64° N, 140° W). In Alaska, species and variety follow the Yukon River westward (Circle, 66° N, 144° W; on Porcupine River 40 miles above the mouth, 67° N, 144° W; Ft. Yukon, $66^{\circ} 30'$ N, 145° W; between Rampart and Tanana; Ft. Gibbon and Tanana, 65° N, 152° W; and Nulato, 158° W). On the tributary Tanana River, the species occurs at Fairbanks and Hot Springs and the variety at Nenana. The species has been found in but one Alaskan locality outside the Yukon drainage. Collections have been made at and above ~~Paxson's~~ Paxson's (Roadhouse), just south of the divide separating the north-flowing Tanana and the south-flowing Gulkana-Copper River drainages.

The range recorded above covers 37 degrees of latitude (30-67° N) or some 2600 miles, and 90 degrees of longitude (68°^{*} in New Brunswick to 158° in Alaska). The Life Zones covered are the Carolinian, Alleghanian, Canadian, and Hudsonian, with the Arctic Zone almost reached at point[^] on the Yukon River.

One striking fact regarding both S. lasiandra and S. interior is that there is little or no more observable variation in characters ^{between} ~~among~~ plants collected at the two extremes of this range than between plants collected at any one point within the range.

There must be some explanation for the unusual ability of these two species to become adjusted to the wide differences in temperature, precipitation, humidity, length of season, and length of day occurring in these vast ranges.

Extensive, but Discontinuous, East-West Ranges

Different species of Salix which occur commonly in our northeastern and north-central States ~~penetrate~~ and adjacent Canada penetrate westward to very different distances. Some, like S. interior, S. cordata, and S. discolor, are replaced in the Rocky Mountains and westward by related species. Others, like S. amygdaloides, reach, but do not pass, the Sierra-Cascade barrier. Still others, like S. pedicellaris var. hypoglauca, S. candida, and S. Bebbiana, occur practically to the Pacific Ocean.

Two species which penetrate only to the front^{*} range of the Rocky Mountains, and that only by discontinuous distribution, are discussed below.

3. Salix seriissima (Bailey) Fernald, related to S. lucida of the East and S. caudata and S. lesiandra of the West, occurs commonly from New England and Lower Canada westward. Its southern boundary (Map 2) lies along the southern edge of the Great-Lakes area to St. Paul and ^{Kandiyohi} ~~Wabasha~~ Co. in Minnesota, thence northward through Ottertail and Clearwater Cos. and westward in the northern tier of counties (Pembina, Rolette) in North Dakota. From here the line curves far northward in the drier plains of Saskatchewan and turns westward to Calgary and the Banff area in southern Alberta. Northward the range extends to Lake Athabaska and southern Mackenzie.

By discontinuous distribution, the species occurs in three separate areas to the south and west of its normal area. The first area includes Flathead (Glacier Park) and Choteau Counties in northwestern Montana, some 150 and 230 miles south of Calgary. Far to the west and south of the main distribution are two mountain outposts in South Dakota and Colorado. In the Black Hills of South Dakota, Professor A.C. McIntosh found it in sedge moor at two localities near Deerfield, Pennington Co., in 1928 and 1929. In the Front Range of the Rockies in Colorado, Professor E.C. Smith collected it at Long's Peak Inn, elev. 9000 ft., on Longs Peak, Larimer Co., in 1935, 1936, and again in 1938.

Previously, the writer had presented the distribution of this species in the United States and Canada in two different papers (Bot. Gaz. 72:220-22, 1921; Can. Field-Nat. 40:147-48, 1923). The first publication brought forth a statement from Francis Welles Munnewell (Rhod. 25:67-68, 1923) that he had collected S. seriissima on Longs Peak in 1913 and that the determination had been verified by Dr. Fernald. In the second paper, and again in Deam's Shrubs of Indiana, the writer erroneously credited this collection to Pikes Peak instead of Longs Peak.

The Black Hills locality is about 450 miles from the nearest North Dakota station, and about 500 and 600 miles, respectively, from the two Montana stations far to the northwest. The Longs Peak station is 600 miles from Rolette Co., N.D., and 600 and 700 miles from the two Montana stations.

The species has not been found in all of the intervening expanse of Rocky and Big Horn Mountains. Are these southern stations remnants of the farthest southern push of the species during glacial times and its wide northern distribution a re-occupation of territory lost during the Glacial Epoch?

4. Salix petiolaris J.E. Smith has much the same eastern distribution (Map 2) as S. serissima. It ranges slightly farther south, occupying the northern third of Indiana and the two northernmost tiers of counties in Iowa as far west as the Mississippi-Missouri divide. From northwest Iowa, the line runs to west-central Minnesota (Chippewa Co.), northeastern South Dakota (Day Co) and adjacent North Dakota (Richland Co.), and thence passes through McLean, McHenry, and Bottineau Cos. of central and north-central North Dakota and on into Canada. The western border of its continuous distribution this is somewhat farther to the south and west than that of S. serissima. It is a low, clumpy shrub in the southern part of its range and gradually becomes larger northward, becoming a small tree in the Prairie Provinces. It extends at least to Lake Athabaska.

Correlated with the somewhat greater western extension of its continuous distribution, is its broader and deeper discontinuous penetration far to the west and south of its main range. Four separated areas are occupied, namely, (1), the sandhills of northwestern Nebraska and adjacent South Dakota; (2), the Black Hills of southwestern South Dakota; (3), Estes Park in northern Colorado; and (4), the Pikes-Peak area in east-central Colorado.

In 1910 to 1914, it was collected by Bates at the Rowley Ranch near Kennedy in Cherry Co., Nebraska, where it had been found in 1892 by Smith and Pound. In 1912 it was collected at Oasis by Pool and Nelson; in 1933 by Sandoz near Ellsworth in adjoining Sheridan Co.; and in 1941 by Tolstead at Bear Creek and Dewey Lake in Cherry Co., and at Ainsworth in Brown Co., to the east. These three contiguous counties all lie in north-central Nebraska and westward. In 1901, H.P. Baker had collected it ^{at} Purdum in Thomas Co., adjoining southeastern Cherry Co. In 1943, Kienper collected it in Dawson Co. in south-central Nebraska, and in Arthur Co, near the northeast corner of Colorado. In 1924, Over had found it in Bennett Co. in southwestern South Dakota, just across the State line from Cherry Co., Nebraska.

S. petiolaris seems to be distributed over the eastern face of the Black Hills of southwestern South Dakota, in Custer, Pennington, Lawrence, and Meade Counties. It was collected by Setzer (Jim Creek, Twp. 2 N, R. 5 E) in 1913; by Murdoch (Bear Butte Creek, Twp. 4 N, R. 4 E) in 1919; by Over (Castle Creek and near Merritt) in 1924, and by McIntosh (at Squaw Creek, 12 mi. above Game Lodge, and at Sylvan Lake) in 1926, and again (at Custer and at Castle Creek, Deerfield) in 1928.

In Colorado, the species occurs in two separated localities. Ernest C. Smith collected 7 numbers at ^Estes Park, elevation 7500 feet, in Larimer Co., in 1933 and 1934. Near Pikes Peak, in 1935, J. H. Christ found it east of Divide in Teller Co. and in Black Forest, El Paso Co.

The sandhills area of Nebraska-South Dakota, and the Black Hills area of South Dakota, lie some 300 to 400 miles ~~xxxxxxx~~ west-southwest of the margin of the eastern distribution. The two mountain localities in Colorado are about 100 miles apart, 300 to 350 miles southwest of the Nebraska and South Dakota areas, and 600 to 700 miles southwest of the margin of ^{western continuous} ~~eastern~~ distribution.

In the case of S. serissima, there are two isolated and distant localities of discontinuous distribution. In that of S. petiolaris, there are two relatively extensive areas and two isolated mountain localities of such distribution.

Abstract

Two American willows have astonishing south-north ranges, from lat. 30° or 32° to 67° N. (2700-3000 miles). Salix lasiandra Benth. (and its var. lanceifolia (And.) Rebb) occurs from Lower California to the Yukon Valley in NE. Alaska. S. interior Rowlee occurs from the mouth of the Mississippi River to the Yukon and Porcupine Rivers in NE. Alaska. They cover the Sonoran (or Carolinian), Transition (or Alleghanian), Canadian, and Hudsonian Life Zones, and almost touch the Arctic Zone. They grow vigorously under extreme differences (130° ^{of temperature} above to 75° below zero F.), precipitation, humidity, and length of season and of day.

The other species, S. serissima (Bailey) Fernald and S. prtiolaris Smith, occur at low elevations from the Atlantic Coast westward to or into the Great Plains, and then, by discontinuous distribution, reappear sparingly in the front ranges of the Rocky Mountain ~~sys~~ system. Their U.S.-Canadian areas of continuous distribution overlap but their mountain distributions are separate. Maps illustrate these facts. All four are essentially uniform in characters throughout their ranges.

S. interior & var pedicellata

Alaska

- x Circle, 66°N, 144°W (var.)
 (var.) Anderson 2581 NHCan, CAS
- x Ft Yukon, (Arctic Circle, 145°W (sp.).
 NHCan
- ms x Ft. Ribbon 65+°, 152°W (sp.) Hitchcock USN
- x Tanana, 65°N, 152°W. (sp.) Setchell 510 CRB
- ms x ~~Fort~~ Rampart Tanana abt. 151° (var) " 443, 511 CRB
- ms x Porcupine R., 40 miles above its mouth, Murie 3.
 (sp) 67°N, 144W USN
- ms x Nulato, 6 N, °W, (sp.) Hitchcock USN
- ms x Hot Springs ~~(near Fairbanks)~~ Kellree (sp.) WSN
- x Fairbanks, Tanana R. 65°N, 14730' W (sp.) Let 517-18 PAB
- x Nenana (var) ~~(sp.)~~ Hitchcock USN
 (var) ~~of Lake~~ Wise
- x Paxson's (sp.) (500 ft divide, in Redwater) NHCan
- x Above Paxson (sp) (of Upper R. Went 13, 1934 CRB

Yukon

- 64°N, 140°W.
- ms x Dawson, (var) (sp. & var common) NHCan
- " (var) Eastward 465 CAS, NHCan, USN
- " (sp.) common Eastward Hitchcock " " "
- ms x Ogilvie, Yukon R., (var) Eastward 63°30'N, 140°W. CAS
- Island 20 mi. below Dawson (sp) Collier 3, 8 USN

S. interior and Var. pedicellata
Saskatchewan

- * Prince Albert Natl. Park (sp + var.)
Common no. to Saskatoon PRB. (" " ")

USN.
C148

Alberta

- * Ft. Assiniboine (sp.)
* Ft. McMurray (sp.) Preble 181

NH Can

USN

Lake Athabasca, West end

- * Athabasca Delta, 9 mi above mouth (sp.) Preble USN
" " " " (var.) L. 42, 49. CRB
* Firebag R. in mouth (var.) Preble 6012 CRB
58° 43' N, 111° 2' W

Wood Buffalo Park, Lake Mamawi (var.)

USN

58° 35' N, 111° 22' W. Preble 2086

(Glen to D. 25 x 6.5 - 7.5 inch)

MacKenzie

(sp.)
Slave R. (no locality) Kennicott in 1860

USN

- * Slave R. near Ft. Smith (var) 60°

NH Can

NH Can Slave Lake, Hay R. 61° N, 116° W. Outlet 8445 CRB

- * Ft. Simpson, Mack. R. 62° N, 122° W (sp.) Kennicott, USN

NH Can (var) W. Rigley, Mack. R. 63° N, 123° W (sp.) Outlet 8764 CRB

NH Can * Ft. Liard 60° N, 124° W (sp.) Outlet 8608-8610 "

- * Mouth Nahanni R. 61° N, 124° W (sp.) Preble 362 USN

Ft. Simpson to Ft. Chipewyan (alta).

NH Can

(BC or Yukon) * Upper Liard R. N.W.T. (60° N, 124° W) Preble 362

NH Can

British Columbia

- * Stikine River, (sp.)

Preble 8668. CRB

S. interius

S. A. Hudson High River Cotton Wood

* Ardmore Pastolo * Belle Fourche

* Custer * Castle Rock * Spearfish

2) S * / Cemetery Wood Co (NW)

Valley City

Stutsman Co, Jamestown

Bothman, Dakota Co

McKimmon
Renoville Co (NW)

Mont. * Harco, * Sheridan Co.

Man. * Melfort * Portage la Prairie

Sask. Swift Current, Yorkton

* / Hudson Bay, * / Edmonton

* / Saskatoon, * / Battle

Saskatoon, Batoche

Man. * / Hay Co. 61 116 rarely

Alta Calgary (Calg.) (Canada Co) Exshaw (Calg. W)

Stettin (Edmonton) (Edm.) / Hand Hills

var. pedicellata

Tex. * / El Paso Co. * / El Paso (Texas Co)

Alta Calgary, Craigville, To Sask, Ark R delta

Get GRK (Wks) from lists

Neb. * / Lincoln Co

* / Keith Co, * / Daves Co, * / Scotts Bluff Co

Stettin, Sask (Co of Edmonton, in Comoros Co)

Northern Distribution of *Salix lasiandra* and var. *lanceifolia*

Saskatchewan

x Bilbourn, Langham, Rosecross (Haskett)
McKague, Runciman (Wallwork) (CRB) x Sask. Prov. Museum

x Prince Albert Nat Park (NMC) (CRB) x Prince Albert Nat Park (NMC)
at L. Waskesiu (CRB)

Alberta

Jasper Park (NMC) (CRB)

Ft. Assiniboine (NMC) (CRB)

x Near mouth of Firebag River,
58° 43' N, 111° 21' W.
Raup 6029-31, 1935 (CRB)

x Craigmyle, Edmonton, ~~Haskett~~
Lesch, Davis, ~~Runciman~~ (CRB)

Banff (CRB)

Edmonton, Ft. Saskatchewan (CRB)

x Athabasca Delta, main branch,
Leaving 38, 8 mi. from mouth
" 51 9 " to mouth.
1920 (CRB)

x Lake Athabasca, W. shore
58° 50' N, 110° 50' W.

Raup 7448, 1932 (CRB)

British Columbia

x Stikine R. near Intl. Bdry.

Cooper 97 in 1916 (CRB)

Kamloops, Kesteven, New Hazelton,
Revelstoke, Waco (CRB)

Hazleton, Int. Bdy, Takla (CRB)

x Dawson (abundant) (NMC)

x Dawson, Setchells 371,

372 in 1932 (CRB)

x Dawson abundant (NMC),

Klondike River, 18-25 mi

E. of Dawson, Setchells

378, 381, in 1932 (CRB)

Alaska

x Hawaters Chilkat R. (USN)

x Salcha Spout

x Matanuska, Setchells 231 in

1931, 605 in 1932 (CRB).

x Fairbanks, Tanana River

Anderson 6088 in 1940

Palmer 6a in 1931 (CRB)

Setchells 433 in 1932

x Nenana, Setchells 422a, 516,

x Blackburn " 468

x Holy Cross " 485

x Fort Yukon

(1932)
(CRB)
(NMC)

x Yukon R. below Holy Cross (USN)

160°

x

x

Colorado

Petalostemum

Larimer Co

Estes Park 7500 ft

Smith 237, 236, 228 (1933)

1557, 3286, 3289, 329 in 1934

El Paso Co. Black Forest

Christ 1005, 1935

Teller Co, East of Divide

Christ 212, 1935

South Dakota

Lawrence Co

near Merritt

Over 16326, 327, 330, 346

all 1924

Pennington Co

Castle Creek

over 16353, 1924

OK ←

Bear Butte Cr J 2

Squaw

Lawrence Co

Bear Butte Creek

July 4 N R 4 E

Pennington Co
Jim Creek

July 24, R 5 E

Section 4, 1913

Bennett Co Over 16343

Day Co, Butte Lake Over 15374

Custer Mt. Rushmore 224

(Custer Co) 1928

Castle Cr. Benfield

June 11, 1925

Sylvan Lake 759, 1925

June 10, 1925

Squaw Creek, 10 miles above

same lake

June 18, 1926

Murdoch 4367

1910

S. petiolaris

S. serissima

Colorado

- x El Paso Co.
- x Teller Co.
- x Larimer Co.
- x Jackson Co. (Archery)
- x Brown Co. (Ameswater)
- x Cherry Co. (Bear Co.)
- x Dawson Co. (Lexington)
- x Sheridan Co. (S. end)
- x Thomas Co.

Nebraska

alberta

calgary, south

x Larimer Co.

alberta Can

Banff + Pks

casitemont

hardigg

South Dakota

- x Bennett Co. (So)
- x Custer Co.
- x Lawrence Co.
- x Pennington Co.
- x Day Co. (NE)

Sask

x Bingham Dist

Red jacket

mckague

Saskatchewan

Graham

mckague

Lesdale

Wallworth

Iowa

- x Emmett
- x Clay
- x Palo Alto

Minnesota

Anoka (Linwood) / Cass Lake

Golden Co.

Shippewa

Itasca

Fault Co. (Brooks)

L. Suer Co. (Waterville, No)

x Hennepin Co. Minn

x Kandiyohi Co.

x Hubbard Co.

x Clearwater Co. (Duluth)

Montana

x Choteau Co. (N.A.)

x Glacier Co. (N.A.)

Choteau Co.

x Yellowstone Co. (Buckhorn)

x McHenry Co.

x Melrose Co.

x Benson Co.

x Roseau Co. (Dunsmuir)

North Dakota

x Richland Co. (Hankinson)

x Burckwood

x Riellette Co.

x Pembina Co.

S. petiolaris C. R. B.

S. Dak. Black Hills

Bennington Co
Castle Creek

Lawrence Co.

Beaver Butte Co. Apr 16 1846

Box Elder Co. near Merritt

Digitized by Hunt Institute for Botanical Documentation

Chester ? Co Buckhorn Mt on Chester

Bennington

Castle Creek, 2 mi

E + SW of Deerfield

Sasko. Common to Collier & Raskin

Alta. common to Ch. moister & Clyde
+ Lesser Slave R.

S. Mamaw 58° 34' N

Range 4405 111° 22' W

S. petiolaris U. S. N. H.

Trub. Thomas Co, Peridium,
14 P. Baker in 1901

S. Dak. Bennett Co, nr Sandhill
Over 16 343 1924
Lawrence Co. nr Merritt
Over 16 357 1924

NO Dak

McIntosh Co Camp Lake, Knickerwood

McIntosh Co, 1917

McIntosh Co, Lake George, Snake
McIntosh 417, 1917

Benson Co, Butte, J. Sunell
2 spec 1907 + 1908

Roberts Co Bull 2485 + 2488

MacKenzie Basin

Wood Buffalo Park

Same as S. interior + 2124

Fire Lake Dist, 59.34 N
Range 2125 112° 15' W

S. serissima CRIB

Winn Arthur, Hennipin, Mandayshi
(Winn Co) = Clearwater Co

No. Dak. Rollette, Turtle Mts. Mabbatt 464

Mont Chisam, Greff, in 1900
Gloss. PK Standley

S. Dak m. Deerfield, m. DeWash
Farm Co. 1158 (1928), 1301 (1929)

Colo. Longs Peak Smith
—, 462, 693 m. 1935

Atta L. Mamawi, 58° 35' N, 110° 22' W
alt. 7000 ft.

~~S. lasiocarpa var. canadensis~~

~~Alaska Matanuska Sitchell~~

~~231 Sitchell 1931
605 " 1932~~

~~Fairbanks / Tanana R~~

U S M K

S. serissima

~~Winn~~
x Clearwater Co. Starca Park

x Kandiyahi Co. Long Lake

x Olmsted Co. Star Lake Twp

x Hennepin Co. St Snelling

N. Dakota

x Rollette Co. Turtle Mts. Mabbatt

Mont Chisam N.P. Small Clear Lake
x Below Lake Mabbatt
4500 ft.

Mackenzie

Slave R. Kemmick, 1860

Wood Bull. PK

as a marker

Range 7034

September 7, 1944

Dr. Charles E. Olmsted,
Dept. Botany, Univ. of Chicago,
Chicago, Illinois.

Dear Dr. Olmsted:

I inclose a 7-page manuscript entitled: Two Ecological Problems in Salix Distribution, with a view to publication in Ecology if found suitable. It has been read by Dr. H. L. Shantz, who felt that it should be submitted to Ecology.

I have prepared two maps for line engravings to illustrate these peculiar distributions. They will be ready soon. One is 4.75 inches high and 5.5 inches wide and the other is 6.5 inches ~~wide~~ high and 5.5 inches wide. If the paper is accepted would Ecology bear the cost of the engravings or would the author pay part or all of these costs?

The paper could be shortened a little here and there, if necessary, although I like to pay tribute to the men whose arduous collecting helps to solve some problems and creates others. I found that all papers can be shortened, while I was editor of the Journ. Amer. Soc. Agron, and during the many years when I was on the Editorial Board of this journal and of Plant Physiology (under Dr. Shull). I am still learning it for abstracts as Editor for Agronomy, Biology Abstracts.

I might remark that I was a member of the Ecological Society of America for several years before I went over into public administration at the University of California and later with the TVA. Just now I am doing the willows of the North-eastern States for Dr. H. A. Gleason, one of your Board of Editors.

Stamps are inclosed for the return of the manuscript if found not usable.

Cordially yours,

Carleton R. Ball
Collaborator

ECOLOGY

CONTINUING THE PLANT WORLD

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CHICAGO 37, ILLINOIS

BUSINESS MANAGER
GEORGE M. REED
BROOKLYN BOTANIC GARDEN
BROOKLYN 25, NEW YORK

October 30, 1944

Dr. Carleton R. Ball
Extension Service,
U. S. Department of Agriculture,
Washington, D. C.

Dear Dr. Ball:

I am sending your note on *Salix* distribution, which you recently submitted to ECOLOGY, to additional members of our editorial board, since there does not seem to be a unanimous opinion that we should accept it. The main question has to do with the extent to which publication of your note might result in a deluge of similar papers in which problems are raised ^{to which} ~~with~~ no solutions ^{are} offered. I shall let you know before long what the final decision will be. Personally, I was much interested in the facts of the distribution.

If the paper is accepted, ECOLOGY will probably bear most of the cost of the engraving. The percentage of illustration permitted is 25%. If your figures ~~can~~ ^{can} be reduced considerably, they would probably not make much more than this amount. If it should be necessary to make the cuts page-size, the percentage would necessarily be much larger, and some of the cost should be borne by you.

Sincerely yours,

Charles E. Olmsted

Charles E. Olmsted

CEO:gs

(See over)

Dr. Charles E. Olmstead,
Editor of Ecology (Botany),
University of Chicago, Chicago 37,
Dear Dr. Olmstead:

November 4, 1944

Your kind letter of Oct. 30 is here and I note action taken on my proposed paper. Editors must be careful in such cases. I recall that while I was Editor or on the Editorial Board of Journ. Amer. Soc. Zagnomy and Plant Physiology, we accepted an occasion paper that posed more problem than solution but I do not recall any flood of such contributions resulting.

I do remember that for Vols. 1 and 2, in both cases, we received many half-baked papers, some by well-known authors, who apparently wanted to get into the very first volumes. On this we were fairly hard-boiled, for the sake of our Journal's reputation among the profession.

I find that the two cuts are 4 in. high by 5 wide, and $6\frac{1}{2}$ in. high by $5\frac{3}{8}$ in. wide, respectively, as made. If the paper is accepted, I will be glad to bear my full share of the expenses of illustration.

Cordially yours,

Carleton R. Ball
Collaborator

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November 15, 1944

Dr. Carleton R. Ball, Collaborator
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Washington, D. C.

Dear Dr. Ball:

Your manuscript has been considered by additional members of the editorial board of ECOLOGY and the consensus seems to be that we should not accept it, chiefly because of the reason I mentioned in my earlier letter. One of the board members, whose opinion I am sure you respect highly, suggested that RHODORA would be a more suitable journal than ECOLOGY for this paper. As you know, similar papers are often published there while we handle very few of them in ECOLOGY.

Thank you for letting us see the paper. I found the data interesting.

Sincerely yours,

Charles E. Olmsted
Charles E. Olmsted

CEO:cm